

ILLINOIS POLLUTION CONTROL BOARD

SIERRA CLUB, ENVIRONMENTAL)
LAW & POLICY CENTER,)
PRAIRIE RIVERS NETWORK AND)
CITIZENS AGAINST RUINING)
THE ENVIRONMENT,) No. PCB 13-15
)
Complainants,)
)
vs)
)
MIDWEST GENERATION, LLC,)
)
Respondent.)

REPORT OF THE PROCEEDINGS had at the hearing on a motion of the above-entitled cause before the Honorable BRADLEY HALLORAN, Hearing Officer of said Court, Room 9-040, The Thompson Center, Chicago, Illinois, on the 27th day of October, 2017, at the hour of 9:01 a.m.

1 A P P E A R A N C E S:

2

3 BY: MS. FAITH E. BUGEL
4 1004 Mohawk Road
5 Wilmette, Illinois 60091
6 (312) 282-9119
7 fbugel@gmail.com

8

9 ENVIRONMENTAL LAW & POLICY CENTER
10 BY: MS. LINDSAY DUBIN
11 35 East Wacker Drive
12 Suite 1600
13 Chicago, Illinois 60601
14 (312) 795-3712
15 ldubin@elpc.org

16

17 ENVIRONMENTAL INTEGRITY PROJECT
18 BY: MR. ABEL RUSS
19 MS. SYLVIA LAM
20 1000 Vermont Avenue NW
21 Suite 1100
22 Washington, D.C. 20005
23 (202) 263-4453
24 aruss@environmentalintegrity.org
slam@environmentalintegrity.org

25

26 SIERRA CLUB
27 BY: MR. GREG WANNIER
28 2101 Webster Street
29 Suite 1300
30 Oakland, California 94612
31 (415) 977-5637
32 greg.wannier@sierraclub.org

33

34 Appeared on behalf of the Complainants;

35

36 NIJMAN & FRANZETTI, LLP
37 BY: MS. JENNIFER T. NIJMAN
38 MS. SUSAN M. FRANZETTI
39 10 South LaSalle Street
40 Suite 3600
41 Chicago, Illinois 60603
42 (312) 251-5255,
43 jn@nijmanfranzetti.com
44 sf@nijmanfranzetti.com

45

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

Appeared on behalf of the Respondent;

REPORTED BY:

Steven J. Brickey, CSR
CSR License No. 084-004675

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24

I N D E X

THE WITNESS: JAMES KUNKEL

PAGE

Direct Examination by Mr. Russ.....	9
Cross-Examination by Ms. Nijman.....	71

E X H I B I T S

Marked for
Identification

Exhibit No. 407	48
Exhibit No.'s 409-410	58
Exhibit No. 408	60
Exhibit No. 100.5	68
Exhibit 24.5E	221

1 HEARING OFFICER HALLORAN: Good
2 morning, everyone. My name is Brad Halloran. I'm
3 a Hearing Officer with the Illinois Pollution
4 Control Board. I'm also assigned to this matter
5 captioned Sierra Club, Environmental Law & Policy
6 Center, Prairie Rivers Network and Citizens
7 Against Ruining the Environment, the complainants,
8 versus Midwest Generation, LLC. It's docketed as
9 PCB 13-15. It's a water enforcement. Today is
10 October 27th, 2017, approximately 9:00 a.m.

11 This has been continued on
12 record from yesterday October 26th, 2017. I think
13 before we begin we had Dr. Kunkel on the stand. I
14 think Mr. Russ has some housekeeping matters.
15 Mr. Russ?

16 MR. RUSS: I do, but my co-counsel
17 would like to clean up some housekeeping matters
18 from a couple of days ago if that's okay.

19 HEARING OFFICER HALLORAN: Sure.
20 Mr. Wannier?

21 MR. WANNIER: Thank you. Very
22 briefly, your Honor. We have cleaned up versions
23 of Complainants' Exhibit 271 and 278Q. We
24 discussed this during the direct examination of

1 Mr. Gnat and we can provide those to all parties.

2 HEARING OFFICER HALLORAN: Do you
3 remember what days those were?

4 MR. WANNIER: I'm sorry?

5 HEARING OFFICER HALLORAN: Do you
6 remember what days of the week we talked about
7 this?

8 MR. WANNIER: Yes, we talked about
9 this on Wednesday and, as we discussed, this is
10 simply without -- the same exhibit without the
11 last page, the printing on the back of the last
12 page.

13 MS. NIJMAN: So this is to replace
14 what had been previously given?

15 MR. WANNIER: Yes.

16 MS. NIJMAN: So does the Hearing
17 Officer have the bad version that he needs to then
18 replace?

19 MR. WANNIER: I --

20 HEARING OFFICER HALLORAN: The bad
21 version is upstairs on my desk. But I'll -- I
22 made a note and --

23 MS. NIJMAN: Okay. For the record,
24 Midwest Gen Bates 6670 through 6734, Complainants'

1 Exhibit 278Q, should be replaced with the new
2 version received today October 27th, '17, and
3 Midwest Gen Bates 43849 through 43857,
4 Complainants' Exhibit 271, should be replaced by
5 the version received today October 27th in the
6 files?

7 HEARING OFFICER HALLORAN: Correct.

8 MR. WANNIER: Yeah. Sorry. Just so
9 the record is perfectly clear. The Bates numbers
10 referenced are the Bates numbers of the
11 replacement exhibits. The original exhibits would
12 have had one additional Bates number at the end of
13 the -- the --

14 HEARING OFFICER HALLORAN: To finish
15 it.

16 MR. WANNIER: Yes.

17 HEARING OFFICER HALLORAN: Thank
18 you, counsel.

19 MR. RUSS: My turn? As far as
20 yesterday's exhibit for the record, I have
21 replaced the demonstrative exhibit that started --
22 it was roughly the last 37 pages in the binder of
23 demonstrative exhibits. It's been replaced with a
24 new 37-page packet that has page numbers. The old

1 version did not. This has a heading describing
2 what the table is and the headings on the summary
3 table on the very last page have been changed.
4 The numbers have not been changed. Everything
5 else is the same.

6 HEARING OFFICER HALLORAN: I'm fine
7 with that. Ms. Nijman?

8 MS. NIJMAN: Yes, that's acceptable.
9 Thank you very much.

10 HEARING OFFICER HALLORAN: Thank
11 you.

12 MR. RUSS: Thank you.

13 HEARING OFFICER HALLORAN: Any other
14 housekeeping matters?

15 MR. RUSS: (Negative nod.)

16 HEARING OFFICER HALLORAN: All
17 right. Dr. Kunkel, new day, new oath. Please
18 raise your right hand.

19 WHEREUPON:

20 JAMES KUNKEL
21 called as a witness herein, having been first duly
22 sworn, deposeth and saith as follows:

23 HEARING OFFICER HALLORAN: Thank
24 you. You may proceed Mr. Russ.

1 MR. RUSS: Thank you.

2 D I R E C T E X A M I N A T I O N

3 BY MR. RUSS

4 Q. Dr. Kunkel, when we left off
5 yesterday, we were talking about the Waukegan site
6 and I had taken one of your demonstrative exhibits
7 and put it up on the screen and zoomed in.

8 And just to clarify where we
9 were, can you give us your general conclusions
10 regarding this site?

11 A. My general conclusions at Waukegan
12 is that groundwater beneath the ponds and even
13 outside the ponds based on the monitoring well
14 data is still receiving contamination, still being
15 contaminated.

16 Q. What is it being contaminated by?

17 A. It's being contaminated by coal ash
18 because the indicator variables; boron, manganese
19 and sulfate occur in high concentrations together.

20 Q. And yesterday we were talking about
21 elevated boron and sulfate concentrations in
22 various wells.

23 Regarding the elevated boron and
24 sulfate concentrations that you noted in wells

1 11 through --

2 MS. NIJMAN: Objection. Leading.

3 MR. RUSS: This was all on the
4 record, but I'm just trying to catch us up.

5 HEARING OFFICER HALLORAN: You may
6 proceed, Mr. Russ.

7 MR. RUSS: Is that okay?

8 HEARING OFFICER HALLORAN: Yeah.

9 BY MR. RUSS:

10 Q. Regarding the elevated boron and
11 sulfate in wells MW-11 through MW-14, what is your
12 opinion about where that boron and sulfate is
13 coming from?

14 A. That boron and sulfate is coming
15 from oxidation of coal which is present in the
16 borings done by ENSR adjacent to those well
17 locations and those borings are in ENSR's
18 environmental site assessment. It was done in, I
19 believe, 1998.

20 Q. And what are your conclusions
21 regarding the relationship between the Tannery
22 site to the west of those wells and the
23 groundwater quality in those wells?

24 A. Wells 10, 11, 12 and 14?

1 Q. Yes.

2 A. Those wells I suppose could be
3 receiving some contaminants although I doubt if
4 it's boron and sulfate from the Tannery site
5 because the groundwater gradient is from the
6 Tannery site towards this lake feature here that
7 is the cooling water source for the power plant.
8 So the groundwater flows generally going this
9 direction in this part of the site.

10 Q. Did you plot the ground -- your
11 interpretation of the groundwater flow in your
12 report?

13 A. I did.

14 Q. Can we turn to Exhibit 401 in the
15 binders.

16 And this would be the tables and
17 figures are after the text of the report and this
18 would be Figure 18. I don't have it on the
19 screen, but it's in the binders.

20 Dr. Kunkel, can you explain what
21 this map/chart is showing?

22 A. Certainly. Figure 18 is my
23 interpretation of contours based on Midwest's
24 water surface elevations which occurred on June --

1 in June 2011, during that time period, and what it
2 shows is it shows that the ponds and a little bit
3 of area upstream from the ponds happen to be right
4 on a groundwater divide and you can see from the
5 white arrows what the flow paths might be. Those
6 flow paths are perpendicular to the potentiometric
7 lines which are labeled as groundwater elevation
8 lines in red.

9 So what it says is that flow
10 from the Tannery site except for just a very small
11 portion of the -- of the maybe south part, mid
12 south part of the site, either flows northeast
13 towards this area or flows back down southeast
14 towards Lake Michigan.

15 Q. And can you identify the specific
16 sources of coal ash that you believe to be
17 contaminating the groundwater at this site?

18 A. I can. I believe those sources are
19 in this area that's the former ash slag storage
20 area as well as ash located as part of
21 construction of the pond dikes.

22 Q. Okay. Regarding that former slag
23 ash area, why do you believe that's a source of
24 contamination?

1 A. Because we see coal ash in -- in --
2 in many of the borings and, pardon me, that's why.
3 That's the source.

4 Q. How -- how does your analysis of the
5 groundwater data influence that opinion?

6 A. The groundwater flow directions --
7 well, if we go back and look at the tables that I
8 had in my demonstrative, we see that the
9 concentrations of boron and MW-5 and also MW-7 are
10 much, much higher than the concentrations of boron
11 and sulfate in MW-6, 8 and 9, but these are still
12 above -- all of these are above background and
13 also for the most part above the Illinois state
14 groundwater standards for both boron and sulfate.
15 I'm talking in generalities. I don't have the
16 numbers in front of me.

17 So I would conclude that these
18 wells are receiving contaminants from this blue
19 rectangle and these wells out here, 6, 8 and 9,
20 are also receiving contaminants from vertical
21 leachate of that -- of that former ash slag
22 storage area.

23 Q. And which of these wells are down
24 gradient of that blue rectangle?

1 A. The down gradient wells are wells, I
2 guess, 7, 5 and 9 according to the contour map on
3 Figure 18 -- 18, 19 and 20. They're similar.

4 Q. Okay. And regarding the ash that
5 you mentioned -- I don't want to misstate your
6 testimony.

7 Can you describe the other
8 source of ash outside of the ponds that you were
9 talking about?

10 A. Well, we know from the -- from the
11 Valdes reports that ash was used for the dikes of
12 the east and west ash ponds. It was also used to
13 fill around the site.

14 Q. Okay.

15 A. So that's also a source.

16 Q. I think we'll come back to that in a
17 minute.

18 When were these ash ponds
19 relined in the last 15 years roughly?

20 A. Roughly 2003, 2004, 2005 with
21 varying dates.

22 Q. What did you say about that in your
23 expert report?

24 A. In my expert report, I said that it

1 was some misinformation that was provided to me.
2 I said they were relined in 2002, but they
3 weren't. That was -- the Hypalon was, I guess,
4 removed and in 2000- either '03 or '05 or '03 or
5 '04 depending on the -- on the references --

6 HEARING OFFICER HALLORAN: Could you
7 keep your voice up, Dr. --

8 BY THE WITNESS:

9 A. HDPE was installed in these -- in
10 these two ponds. So part of the contamination
11 could also be existing contamination from liner
12 leaks, past liner leaks as well.

13 BY MR. RUSS:

14 Q. Just to clarify, how many times do
15 you believe those ponds were relined in the past
16 20 years?

17 A. Relined once.

18 Q. Right. Thank you. And turning to
19 Exhibit 44, which I've already introduced. Have
20 you seen this e-mail before?

21 A. Yes, I have.

22 MS. NIJMAN: Just a second. I'm
23 sorry.

24 MR. RUSS: I'm sorry. My apologies.

1 MS. NIJMAN: Thanks.

2 BY MR. RUSS:

3 Q. What does the e-mail say about the
4 relining date?

5 A. Well, this is an e-mail from -- from
6 Maria Race to Lynn Dunaway and it says that Maria
7 knew that the ponds were lined in 2001 with HDPE
8 when she started working here, which means at
9 Midwest, and then she said "We relined them in
10 2002, in the 2002 timeframe. I don't remember if
11 we had a construction permit."

12 Q. Okay. That's all. We can put that
13 down. Thank you. Did you evaluate the bottom
14 elevations of these ash ponds?

15 A. I did.

16 Q. Why was that significant?

17 A. Well, again, because what I saw in
18 the original Patrick report showed that the bottom
19 elevation of -- of the ponds were lower than the
20 water surface elevation of Lake Michigan.

21 Q. Can I pause for a second? I think
22 we can turn to that. I think it's in the binder.
23 That would be Exhibit 14 -- not in the binder. In
24 the stack that I set aside yesterday. 14C. Turn

1 to Bates page 7165 also shown as Figure 4.

2 Is this what you're referring
3 to, Dr. Kunkel?

4 A. Yes.

5 Q. Can you explain what this shows?

6 A. This shows a cross section through
7 the ponds Section AA Prime, which is a cross
8 section east and west across just north of the
9 ends of the dikes here and it shows that the pond
10 bottoms are well below the groundwater elevations
11 which are highly dependent upon the lake level
12 elevations by five or six or seven feet, maybe
13 more.

14 Q. Have you seen more information about
15 the pond bottom elevation since then?

16 A. I have.

17 Q. In your opinion, is this an accurate
18 drawing?

19 A. It is not.

20 Q. Can we turn to Exhibit 100 and this
21 one is also in the stack that I handed out
22 yesterday.

23 MS. NIJMAN: One-hundred?

24 MR. RUSS: One-hundred.

1 BY MR. RUSS:

2 Q. I don't have a copy on paper, but
3 I'm going to -- I believe at the end of that
4 exhibit there is an engineering drawing that I'd
5 like you to explain, the Valdes.

6 A. It's in the Valdes report?

7 Q. At the very end.

8 A. Oh, there it is, yes. Yes, there it
9 is.

10 Q. This is what it looks like. At this
11 resolution, it's totally illegible. Do you recall
12 seeing this drawing at some point?

13 A. Yes, sure.

14 Q. And can you explain what this is?

15 A. This is a drawing that was approved
16 for a construction.

17 MS. NIJMAN: I guess I'm just going
18 to object to the extent that the same objection
19 was made about my use of a map that was illegible.

20 MR. RUSS: Well --

21 MS. NIJMAN: I'm not sure we can do
22 this.

23 MR. RUSS: I'm blowing it up on the
24 screen.

1 HEARING OFFICER HALLORAN: Mr. Russ,
2 Ms. Nijman is not finished yet.

3 MR. RUSS: I'm sorry.

4 MS. NIJMAN: I made the same
5 argument and Ms. Dubin was not satisfied that she
6 could see it on the screen and insisted upon
7 having large, hardcopies of the map so that we
8 could all read it together.

9 HEARING OFFICER HALLORAN: Mr. Russ?

10 MR. RUSS: We don't have a large,
11 hardcopy of the map.

12 MS. BUGEL: We can get one.

13 MR. RUSS: We can get one today.

14 HEARING OFFICER HALLORAN: Okay. So
15 my ruling is stayed until --

16 MR. RUSS: In the meantime, would it
17 be okay to zoom in?

18 HEARING OFFICER HALLORAN: Yes.

19 MS. NIJMAN: I'm sorry. I was not
20 allowed to continue testimony with regard to the
21 map until we had it in front of us.

22 HEARING OFFICER HALLORAN: I don't
23 recall that, is that -- is that true?

24 MR. RUSS: I don't recall. I'm

1 happy to -- whatever you'd like to do.

2 HEARING OFFICER HALLORAN: Okay.

3 Ms. Bugel, when can we get a --

4 MS. BUGEL: I need to find out how
5 quickly we can get large, hardcopies. I need to
6 get in touch with someone back at our office.

7 HEARING OFFICER HALLORAN: All
8 right. Let's not talk about this figure then.

9 MR. RUSS: Sorry?

10 HEARING OFFICER HALLORAN: We can't
11 talk about this figure. Ms. Nijman objects.
12 Apparently --

13 MR. RUSS: Can we talk about the
14 portion --

15 HEARING OFFICER HALLORAN: You
16 have -- you have to stop. It's early in the
17 morning and it's starting already.

18 We have to stop based on
19 Ms. Nijman's objection until we get a legible map.

20 MR. RUSS: Would it be okay to
21 testify about a portion of the figure that is
22 legible?

23 MS. NIJMAN: I think we should wait.

24 HEARING OFFICER HALLORAN: I think

1 we're going to wait.

2 MR. RUSS: That's fine.

3 HEARING OFFICER HALLORAN: I hate to
4 piecemeal this. It would be kind of confusing.

5 BY MR. RUSS:

6 Q. Setting that aside. Do you recall,
7 Dr. Kunkel, what is your current opinion about the
8 elevation -- the bottom elevation of those ponds?

9 A. That they are above -- clearly above
10 the water surface elevation of Lake Michigan and
11 for the most part above groundwater elevations as
12 well, at least based on the data we have which is
13 a fairly short time series for groundwater
14 elevations.

15 Q. Do you remember the bottom elevation
16 of those ponds?

17 A. Well, only what I saw from that
18 figure.

19 Q. Okay. Let's not talk about that.

20 A. That's the only thing I know.

21 Q. Okay. Let me see here. Can we turn
22 to Exhibit 270P, which is in the stack I handed
23 out yesterday.

24 MS. NIJMAN: Abel, what is the

1 number?

2 MR. RUSS: 270P.

3 MS. GALE: 270B?

4 MR. RUSS: P.

5 THE WITNESS: P as in --

6 MR. RUSS: 270P as in Paul. This
7 starts at Bates page 62387. It goes through --
8 I'm sorry. MWG 13-15_62387 through MWG
9 13-15_62468.

10 BY MR. RUSS:

11 Q. Can you turn to Bates page 62393 and
12 can you describe what this is for me?

13 A. This is a summary of groundwater
14 elevations at the Waukegan station from wells MW-1
15 through MW-7 for the period 11/2014 through
16 5/2017.

17 Q. And looking at -- I'm sorry. Let me
18 think about this.

19 Which of the monitoring wells at
20 the site are immediate up gradient of the ash
21 ponds?

22 A. Wells 5 -- well 5.

23 Q. And can you tell us what the range
24 of groundwater elevations in MW-5 is?

1 A. Yeah, at MW-5 the groundwater
2 elevation ranges from 582.5 -- 581.02 to 583.96.
3 That's the range more or less unless I missed
4 something. No. 584.15. Yeah, 584.15.

5 Q. Okay.

6 A. In that five foot, four foot range,
7 three foot range.

8 Q. Can you explain why that elevation
9 is significant?

10 A. That elevation is significant
11 because it's very near the reported pond bottoms
12 at the east and west ponds at Waukegan station.

13 MS. NIJMAN: Objection. No facts in
14 evidence.

15 HEARING OFFICER HALLORAN: Mr. Russ?

16 MR. RUSS: They will be in evidence
17 later.

18 HEARING OFFICER HALLORAN: You can
19 cross, Ms. Nijman. You can continue.

20 BY MR. RUSS:

21 Q. In your expert opinion, is this the
22 maximum groundwater elevation in that well?

23 A. It's a maximum elevation that is --
24 was recorded in that time period, but it doesn't

1 mean it's the maximum that would ever be there or
2 that could be there or anything like that.

3 Q. In your expert opinion, how does the
4 federal coal ash rule that we looked at apply to
5 these bottom elevations -- groundwater elevations?

6 A. Well, none of these -- none of these
7 groundwater elevations would -- would, in my
8 opinion, meet the five foot coal ash rule.

9 Q. Okay. You mentioned ash in the
10 berms of these ponds, why -- can we turn to
11 Exhibit 14C.

12 HEARING OFFICER HALLORAN: I'm
13 sorry?

14 MR. RUSS: 14C also in that stack.

15 BY MR. RUSS:

16 Q. Then turn to Bates page 7171.

17 MS. GALE: I'm sorry. Abel, you
18 said 7171?

19 MR. RUSS: 7171.

20 BY MR. RUSS:

21 Q. Dr. Kunkel, can you explain what
22 this shows?

23 A. This is the drillers log for well
24 MW-3 which is this well right here on the -- on

1 the east side of the east coal ash pond. I can
2 explain further.

3 Q. Yes.

4 A. And it is a well that -- or a bore
5 hole that is 30 -- it is a well -- well hole that
6 is 30 -- 30 feet deep and extends from the ground
7 surface and the top 18.5 feet is fill material.
8 So it was artificially placed and that 18.5 feet
9 of fill material contains coal cinders and ash,
10 cinders and ash, sand, fine sand, silty sand,
11 coarse coal cinders and so it indicates there is
12 at least 18.5 feet of fill material that has coal
13 ash in it.

14 Q. To the best of your recollection,
15 what did the boring logs for MW-1, 2 and 4 --

16 A. I believe they show something
17 similar.

18 Q. And where do you believe the
19 elevated boron and sulfate concentrations in MW-1,
20 2, 3 and 4 are coming from?

21 A. I think they're almost -- well,
22 possibly two sources, but they could be coming
23 from up gradient from -- from this area up here,
24 but most likely because of the concentrations

1 they're coming from the coal ash that is in this
2 fill material where -- where the wells are
3 completed.

4 Q. Thank you. So you mentioned ash
5 ponds and ash fill outside of the ash ponds as
6 potential sources of the elevated boron and
7 sulfate concentrations, can you rule either source
8 out?

9 A. No.

10 Q. What is your opinion about the
11 timing of this contamination?

12 A. I'm not sure I understand timing. I
13 mean, I have data from 2010 to present and clearly
14 there is contamination occurring then and now.

15 Q. Okay. Thank you. Did you also
16 review data for other groundwater quality
17 monitoring parameters?

18 A. Manganese and TDS.

19 Q. What did those data tell you about
20 your conclusion?

21 A. That coal ash is the source of the
22 groundwater contamination.

23 Q. If we turn to the very last page of
24 the demonstratives, page 37.

1 With reference to that table,
2 can you explain what you're talking about?

3 A. Yeah, this is the combined list of
4 groundwater monitoring results which had
5 concentrations greater than the Illinois Class 1
6 groundwater standard, groundwater quality
7 standard.

8 MS. NIJMAN: I'm sorry. The results
9 I'm seeing on this replaced table are different
10 for Joliet 29 than the old one. You told me there
11 were no other changes to this document.

12 MR. RUSS: I don't believe there
13 are.

14 THE WITNESS: We had boron of two.

15 MR. RUSS: I have two copies here.

16 MS. NIJMAN: Exactly.

17 HEARING OFFICER HALLORAN: Let's go
18 off the record and clear this up.

19 (Whereupon, a discussion was had
20 off the record.)

21 HEARING OFFICER HALLORAN: We're
22 back on the record.

23 THE WITNESS: This is Table 3,
24 Summary Table 3.

1 BY MR. RUSS:

2 Q. And, Dr. Kunkel, can you explain
3 what you were saying with reference to this table?

4 A. Yes, this is the combined list of
5 groundwater monitoring results whose
6 concentrations are greater than the Illinois Class
7 1 groundwater quality standard. In other words,
8 it's the count of the number of times that the
9 concentration of these constituents was higher in
10 all the monitoring wells than the Class 1 --
11 Illinois Class 1 groundwater quality standard and
12 in Waukegan for boron we had 110 times that the
13 concentrations of boron were greater than two.
14 For sulfate, we had 30 feet -- 35 times in those
15 wells that the concentrations of sulfate were
16 higher than the Class 1 groundwater quality
17 standard, et cetera. Manganese was 55 times.

18 Q. Okay. Thank you. We're now going
19 to turn to Will County, the last of our sites and
20 getting closer to the end. Looking up at the
21 screen and in your demonstrative packet after all
22 of the Waukegan data there is a couple of maps of
23 the site.

24 Dr. Kunkel, can you describe the

1 basic layout of the site as you understand it?

2 A. Certainly. Will County site
3 hydrogeologically is a little bit different than
4 the other sites which were basically alluvial
5 systems, unconsolidated systems. This one has
6 a -- Will County has a mantel of unconsolidated
7 material, but the bottoms of the ponds and the
8 monitoring wells are completed in dolomite, which
9 is rather shallow right at this site. That's
10 important for a couple of reasons.

11 First of all, on the west side
12 of the site, we have the Des Plaines River again
13 and on the east side you can't see it, but there
14 is a major canal over here that carries barge
15 traffic and those two water features essentially
16 control the direction of groundwater flow across
17 the whole site, okay, not necessarily in the pond
18 area, but across the whole site.

19 Right now the figure you're
20 seeing has the ten original monitoring wells that
21 were constructed around the ponds at Will County
22 and then there were two more monitoring wells 11
23 and 12 that were constructed later on and 11 is
24 located between ponds 2S and 3S. I'm sorry. Is

1 that right? Yeah, there they are. 2S and 3S and
2 pond 12 was located down in the southwest corner
3 of ash pond 3S.

4 Q. Can you turn to exhibit now 36 in
5 this stack that I handed out yesterday.

6 Can you describe what this is?

7 A. This is -- appears to be a document
8 which was from Richard Frenndt at Patrick
9 Engineering to Maria, and I assume that's Maria
10 Race, which is dated January 7th, 2011.

11 Q. Have you seen this e-mail before?

12 A. Yes.

13 Q. In the e-mail, it says at Will
14 County, for example, there is strong hydraulic
15 evidence to suggest that everything is down
16 gradient, can you explain what that means?

17 A. It would be easier for me to explain
18 the fact that there is nothing up gradient. There
19 is no up gradient wells. I think that's what
20 Mr. Frenndt was trying to --

21 MS. NIJMAN: I'm going to object to
22 the speculation and misstatement of evidence as
23 this document was testified to by Ms. Race in a
24 completely different manner.

1 HEARING OFFICER HALLORAN: You know,
2 you have your cross coming up, Mr. Nijman. You
3 can flesh out any problems then. All right.
4 Thank you.

5 BY MR. RUSS:

6 Q. You can --

7 A. I can read from the document Richard
8 Frenedt says "To make things worse, the term up
9 gradient isn't always clear." This is in
10 reference to Will County. "At Will County, for
11 example, there is a strong hydraulic evidence
12 suggesting that everything is down gradient."
13 It's exactly what -- what the issue is. The idea
14 being is we don't have a well here that we can
15 consider background at the time that this -- this
16 e-mail was written.

17 Q. And it goes onto say the ponds may
18 be draining in multiple directions, can you
19 explain what that means?

20 A. Yeah, I don't necessarily agree
21 completely with that. The -- because I don't
22 think Frenedt had the same data that I had because
23 he refers here that the ponds are draining in
24 multiple directions towards either the river or

1 the canal. Excuse me. And I found at least one
2 monitoring point that ENSR had done in the site
3 area when they did their phase two -- phase one
4 and/or phase two environmental assessment report
5 that said there's a groundwater divide right down
6 the middle of the site and that everything to the
7 east drains to the canal and everything to the
8 west groundwater drains to the river and if you
9 look in my report all water elevations in the
10 canal are substantially lower than water levels in
11 the river and I can't imagine that river water is
12 actually draining all across the site and into the
13 canal. It's pretty drastic elevation changes and
14 the gradients would be superhigh --

15 Q. Can you --

16 A. -- and we just don't see that.

17 Q. I'm sorry, Doctor.

18 A. Yeah, we just don't see that because
19 we have higher elevations of groundwater
20 elevations on the west side of the pond -- on the
21 east side of the pond than we do on the west side
22 of the pond. So it isn't likely that water is
23 actually draining from the river to the canal.

24 Q. So turning to Exhibit 101 in the

1 binder. This is your report. Page -- page 32 of
2 your report.

3 MS. NIJMAN: Exhibit 401?

4 MR. RUSS: I'm sorry?

5 THE WITNESS: 401.

6 MR. RUSS: Yes, 401.

7 MS. NIJMAN: Page?

8 MR. RUSS: Page 32.

9 BY MR. RUSS:

10 Q. At the very bottom your report
11 describes groundwater mounding at Will County, can
12 you describe what that means?

13 A. As I said before, part of the
14 problem when we're near the surface waterbodies,
15 especially rivers, is that the water surface
16 elevation in the rivers goes up and down as rain
17 falls, snow melt occurs and what happens is when
18 the water level in the river goes up it actually
19 recharges back into the banks and changes the
20 water surface elevation of the groundwater. And
21 it could be substantial changes. It could be feet
22 of changes. And then when the water level in the
23 river goes back down, the water doesn't drain out
24 of the banks or the -- or the area adjacent to the

1 river as quickly and it appears when that happens
2 it's not equal drainage because of the anisotropy
3 of the materials and it appears that there is
4 mounding. So it's difficult for me to interpret
5 whether that's due to leaky ponds or due to this
6 fluctuation of river levels and changes in the
7 groundwater flow direction either in or out of the
8 river.

9 Q. You said anisotropy?

10 A. Anisotropy.

11 HEARING OFFICER HALLORAN: Can you
12 spell it for --

13 BY THE WITNESS:

14 A. A-N-I-S-O-T-R-O-P-Y. If something
15 is isotropic, that -- the definition of isotropic
16 is that it has the same physical properties
17 everywhere, no matter which direction you look the
18 properties are the same and anisotropic means that
19 they aren't the same. And most of the world is
20 anisotropic. In other words, we wouldn't expect
21 to see a hydraulic conductivity at one point in
22 the site to be the same as another hydraulic
23 conductivity somewhere else on the site.

24

1 BY MR. RUSS:

2 Q. Okay. Thank you. Did you review
3 groundwater quality data for Will County?

4 A. Yes.

5 Q. What wells were those data collected
6 from that you looked at?

7 A. For all -- all the wells. Wells 1
8 through 12.

9 Q. Okay. Thank you. Can we turn to
10 the demonstrative section of the binder, the Will
11 County section. It starts at the end of all of
12 the Waukegan data with the maps we've been looking
13 at. And I'm going to skip the first page of
14 numbers which is an example as we discussed
15 earlier.

16 HEARING OFFICER HALLORAN: Give me a
17 chance, Mr. Russ.

18 MR. RUSS: Sure.

19 HEARING OFFICER HALLORAN: I'm
20 there. Are you there, Ms. Nijman?

21 MS. NIJMAN: Yes, depending what
22 page we're starting with.

23 MR. RUSS: We're starting on the
24 second page of data. It has a solid blue band

1 near the bottom covering some of the numbers.

2 BY THE WITNESS:

3 A. The table?

4 BY MR. RUSS

5 Q. Yeah, it says Will County median
6 boron and sulfate concentrations compared to
7 background. Can you explain what this is showing?

8 A. Well, again, this is similar to the
9 other tables where we show the, excuse me, the
10 median concentrations of boron and sulfate for the
11 whole time series of data that we have from 2010
12 through -- from December 2010 through the second
13 quarter I guess it is from 2017 and those are
14 compared to background concentrations of boron and
15 sulfate and, in this case, bedrock because the
16 monitoring wells are in dolomite. So I use the
17 bedrock background concentrations that the
18 Illinois EPA had listed in their technical support
19 document Attachment A based on the whole state of
20 Illinois.

21 It's a regional -- regional type
22 background. We've already established that that
23 background is probably fairly reasonable. It's
24 very reasonable compared to the data that we saw

1 at the Powerton, for example, and this table shows
2 that the concentrations of -- median
3 concentrations of boron are always higher than
4 background and in some cases ten times higher or
5 more than ten times higher than background. For
6 sulfate, the same. The median concentration is
7 always higher than background and at least one
8 case it's an order of magnitude ten times higher
9 than background. It's also noteworthy that in all
10 wells except MW-1 and MW-9 the boron
11 concentrations are higher than two milligrams per
12 liter which is the Illinois state groundwater
13 standard for boron and for sulfate wells MW-4,
14 MW-5, MW-7 and MW-8 have sulfate concentrations
15 that are higher than the Illinois Class 1
16 groundwater standard.

17 Q. And --

18 A. Then there are wells 11 and 12 which
19 are those later wells and they also have similar
20 characteristics, especially for boron. Those are
21 wells MW-11 and 12 where the boron concentrations
22 are an order of magnitude -- nearly an order of
23 magnitude -- in one case slightly less than an
24 order of magnitude higher than background and

1 higher than the Illinois Class 1 groundwater
2 quality standard and for sulfate the two wells
3 have sulfate concentrations higher than
4 background.

5 Q. Turning now to the charts on the
6 next page, can you walk us through these charts
7 well by well?

8 A. Sure. I can't see that screen very
9 well. MW-1 -- MW-1 is the well in the, excuse me,
10 in the northeast corner. It's the furthest north
11 and possibly the furthest east, but it's at least
12 the furthest north well and it shows the time
13 series of boron concentrations on the left side of
14 the -- of the sheet and sulfate concentrations on
15 the right side of the sheet and it's, I guess,
16 interesting to note that ash pond 1N and 1S were
17 abandoned in place.

18 Q. Can you explain what that means?

19 A. That means that they were simply --
20 had some remedial work done inside the pond to
21 drain water, rainwater that fell inside the pond,
22 that would fall inside the pond, rainwater and
23 snow melt and nothing else was done as far as we
24 know according to the -- but well MW-1 it's

1 interesting because it shows that boron because
2 there is still ash in the pond substantially
3 decreased after those pond -- that pond was -- ash
4 pond 1N was abandoned, but is still higher than
5 background and that sulfate in that well has
6 receded, gone down, reduced to a concentration
7 that is right at background after those wells were
8 abandoned because they no longer hold fluid over a
9 long period of time. It drains out.

10 Q. The other wells however, MW-2, which
11 is south of MW-1, and MW-3 which is south of MW-2
12 here on the east side of ash pond 1S -- yes, one
13 south still shows very high concentrations of
14 boron. MW-2 has been -- boron concentrations have
15 been increasing over time as well as sulfate and
16 both those have concentrations -- are higher than
17 background and have gone up to higher than the
18 Illinois Class 1 groundwater standard for both
19 boron and sulfate in MW-2 and MW-3 is similar,
20 increasing concentrations of boron and sulfate
21 with time and boron clearly higher than the
22 Illinois groundwater quality -- Class 1
23 groundwater quality standard and sulfate a
24 borderline case. In the last few quarters, it's

1 again risen to --

2 HEARING OFFICER HALLORAN: Could you
3 keep your voice up, Doctor.

4 THE WITNESS: Yeah.

5 BY THE WITNESS:

6 A. Concentration than the Illinois
7 Class 1 groundwater standard. Turning to MW-4
8 which is south of MW-3 and on the southeast corner
9 of ash pond one south and 5 and 6 these are the
10 wells -- all these wells are on the east side of
11 the ash ponds. The concentrations in 4, 5 and 6
12 for boron have increased over time and are well
13 above background and also above the Illinois state
14 groundwater quality standard for -- for boron.

15 For sulfate in these wells, it
16 is somewhat of a mixed bag, but the concentrations
17 are still well above background and either at or
18 above the Illinois Class 1 groundwater quality
19 standard. So -- so these wells on the east side
20 are still receiving contamination from some source
21 whether it's the leaky ponds or whether it's ash
22 on the surface.

23 Wells -- now, we'll start with
24 the wells on the west side of the pond. These are

1 between the ponds and the river. And MW-7, 7, 8
2 and 9 -- 7, 8 and 9 here on the west side of 1N,
3 2 -- 1S and 2S show concentrations of sulfate --
4 or of boron, pardon me, much higher than
5 background and also higher than the Illinois
6 groundwater quality standard, Class 1 groundwater
7 quality standard except for MW-9, which is that
8 the concentrations kind of hover around that
9 Illinois state standard.

10 Sulfate concentrations are
11 either well above background and either at or
12 above for wells MW-7 and MW-8 for the Class 1
13 groundwater standards at MW- -- for 7 and 8 and at
14 9 --

15 THE COURT REPORTER: Wait. Class 1
16 groundwater at --

17 THE WITNESS: Seven and eight.

18 BY THE WITNESS:

19 A. At MW-9 the sulfate concentrations
20 have decreased slightly from -- to below the
21 Illinois state groundwater quality standard at
22 well MW-9 and then there are the two -- MW-10,
23 which is the well that is furthest down river and
24 it, again, has -- well, high concentrations of

1 boron above both background and the Illinois Class
2 1 groundwater quality standard and sulfate
3 concentrations which are above background and
4 decreasing over time to below the Illinois
5 groundwater quality standard for sulfate and then
6 wells MW-11 -- do you want to change the slide?

7 BY MR. RUSS

8 Q. Sure.

9 A. MW-11 and 12. And MW-11, remember,
10 is between pond two south and three south and
11 MW-12 is south of MW-10 and south and west of ash
12 pond 2S and those data indicate similar to MW-10
13 for both boron and sulfate and that boron
14 concentrations are higher than background and the
15 Illinois Class 1 groundwater quality standards and
16 these are the late time data and sulfate again
17 above background but less than the Illinois state
18 groundwater quality standard.

19 So contamination is still
20 occurring universally throughout these wells
21 except for well MW-1 due to either leaky ponds,
22 the fact that the poz-o-pac may be in wells 2S,
23 1S -- I'm sorry. 1N and 1S might still be
24 transporting leachate downward and that's all I

1 have to say.

2 Q. Okay. I'll just check my outline.

3 Did you evaluate the elevation of the ash ponds at
4 Will County?

5 A. The pond bottoms?

6 Q. Yes.

7 A. Yes, both the top of the liner that
8 was reported to me as well as the bottom, what
9 would be the bottom of the liner.

10 Q. Can you turn to Exhibit 15C in the
11 stack that I handed out yesterday. Bates page
12 7249. Can you explain what this is, Dr. Kunkel?

13 A. Yes, this is from Patrick's
14 Engineering report on the hydrologic assessment
15 for Will County station and this drawing is an
16 east/west cross section as you can see in the
17 little insert down in the lower left-hand side of
18 the page across pond 1N, one north, and it clearly
19 shows that the bottom of the pond is below the
20 groundwater elevation at the time that this was
21 measured or that this was taken and you can see
22 that the monitoring wells also are in the dolomite
23 limestone rather than in the overlying
24 unconsolidated gravels.

1 Q. Why is this -- did you review this
2 as you're developing your opinions?

3 A. Yes.

4 Q. Why is this significant?

5 A. Well, it's significant because if
6 that pond were drained and -- it was lined and
7 drained, lined with plastic we could have
8 hydrostatic uplift as well as depending on what
9 happens with the groundwater elevations, it could
10 be fairly significant hydrostatic uplift loads on
11 that liner, on the bottom liner and the side
12 slopes.

13 Q. For the site, generally based on
14 information you reviewed, what can you say about
15 the bottoms of these ash ponds relative to
16 groundwater elevations?

17 A. At Will County, the bottoms of the
18 ash ponds are nearly always based on the period
19 that I have from 2010 to 2017 below or
20 underneath -- or beneath the groundwater
21 elevations, groundwater levels.

22 Q. Thank you. Are you aware of any up
23 gradient sources of elevated boron and sulfate?

24 A. No.

1 Q. Are you aware of any offsite sources
2 that could be contributing to the elevated boron
3 and sulfate?

4 A. No.

5 Q. In your opinion, is the groundwater
6 at Will County contaminated by coal ash?

7 A. Yes, it is.

8 Q. What are the onsite sources of
9 elevated boron and sulfate?

10 A. The onsite sources are coal ash
11 either from leaky ponds or placed outside the
12 ponds during construction of the dikes, of the
13 fills -- fill above the bedrock.

14 Q. In that same exhibit we were just
15 looking at Exhibit 15C, can you please turn to
16 page -- Bates page 7252. Can you explain what
17 this shows?

18 A. This is a drillers log for the
19 boring for monitoring well MW-2 and if we can
20 recall MW-2 -- let me just get oriented here.
21 There's MW-2. So MW-2 is located just on the
22 southeast side of ash pond 1N and that log shows
23 coal ash, brown gravelly clay sand, gray silty
24 clay and rubble in the fill above a unit of about

1 3.5 feet or so of black coal cinders, coal dust
2 and clay fill, which is wet, above the limestone
3 bedrock.

4 Q. And did you review this when you
5 were preparing your opinions?

6 A. Yes.

7 Q. Can you explain why this is
8 significant?

9 A. Well, it's significant because this
10 has a major source of -- potential source of coal
11 ash contamination to that bedrock aquifer that is
12 being monitored by the monitoring wells.

13 Q. And can you give us your opinion
14 about the rest of the site?

15 A. The rest of the site is similar and
16 I guess the issue is that because bedrock was
17 fairly near the surface when these ponds were
18 constructed, there was fill placed above the
19 bedrock in -- in many locations in order to form
20 enough dikes. So that those ponds could be --
21 could be there, but the bottoms of the ponds
22 typically sit either on or very close to the
23 bedrock, the bottoms of the ponds.

24 Q. And given what you've just talked

1 about regarding the potential sources of coal ash
2 contamination on site, can you rule either source
3 out?

4 A. No.

5 Q. Can you give us your opinion about
6 when this contamination occurred?

7 A. Well, there was contamination that
8 occurred prior to intensive monitoring by Midwest
9 Gen in 2010 and it's continued now through the
10 monitoring period another seven years.

11 Q. And have you looked at other
12 groundwater quality data for Will County aside
13 from boron and sulfate?

14 A. I did. In my report, I looked at
15 manganese.

16 Q. What did the manganese data show
17 you?

18 A. Manganese showed that also there
19 were concentrations in manganese in the
20 groundwater which were higher than --

21 Q. Let me pause you for a second
22 because it looks like you're looking at the
23 demonstrative. We're looking at the last page of
24 the demonstrative.

1 A. This is Summary Table 3, page 37 of
2 37. So at Will County they're -- manganese also
3 was higher than the groundwater quality
4 standard -- Illinois Class 1 groundwater quality
5 standard and also higher than background for
6 bedrock. And boron had 188 times that -- its
7 concentration was higher than the Class 1
8 groundwater quality standard of two, manganese 120
9 times it was higher than the Illinois Class 1
10 groundwater quality standard and sulfate 119 times
11 very consistent and representative of
12 contamination from coal ash.

13 Q. Thank you. I have just one or two
14 more questions and then I'll be done.

15 Did you produce any other
16 reports for us other than the ones we've been
17 looking at?

18 A. I did.

19 (Document marked as Complainants
20 Exhibit No. 407 for
21 identification.)

22 BY MR. RUSS:

23 Q. Can we turn to Exhibit 407 in the
24 binder. I'm sorry. Yes, 407. Can you describe

1 what this is?

2 A. This is my rebuttal report to the
3 expert report of John Seymour.

4 Q. When did you provide this?

5 A. This is dated December 8th, 2015.

6 MR. RUSS: I move to introduce
7 Exhibit 408 into the record.

8 HEARING OFFICER HALLORAN: 407?

9 MR. RUSS: I'm sorry, yes, 407.

10 MS. NIJMAN: Are there going to be
11 any questions concerning it?

12 HEARING OFFICER HALLORAN: Do you
13 have any questions?

14 MR. RUSS: Can we go off the record
15 for a second?

16 HEARING OFFICER HALLORAN: Yes.

17 (Whereupon, a break was taken
18 after which the following
19 proceedings were had.)

20 HEARING OFFICER HALLORAN: We're
21 back on the record. Mr. Russ?

22 BY MR. RUSS:

23 Q. This report discusses the difference
24 between --

1 MS. NIJMAN: Objection. Leading.

2 HEARING OFFICER HALLORAN:

3 Sustained.

4 BY MR. RUSS:

5 Q. Can you explain what this report
6 discusses?

7 A. Yeah, this report discusses my
8 responses to the expert opinions of John Seymour
9 related to my expert report on groundwater
10 contamination, just the groundwater contamination
11 report, and my expert report on remedy which we're
12 not talking about I think in this hearing. And
13 my -- the idea of this report, again, was to rebut
14 John Seymour's interpretations which as a fellow
15 engineer is always difficult to do, but much of
16 his expert report I found to incorrectly interpret
17 the available data and information that I had --
18 had seen and that was in my report of
19 contamination and that the indicator pollutants
20 that I use are clearly from coal ash.

21 That has been well-documented by
22 EPRI, IEPA, US EPA and I think Seymour had said
23 those are not indicator pollutants of coal ash
24 contamination. And that the concentrations at the

1 four plant sites are much higher than background
2 which we've established and that groundwater at
3 the four sites is likely contaminated by coal ash
4 from one or more sources, either from leaky ponds
5 or from ash on the surface and then I go through
6 and I talk about the individual sites; Joliet 29,
7 Powerton, Waukegan and Will County and I think
8 that John Seymour indicated that he felt the
9 concentrations were not either temporally or
10 spatially consistent and I'm not sure what I know
11 he meant by that for sure, but I have rebutted
12 that by saying, yes, they are temporally
13 consistent.

14 We have a nice time series that
15 show how they behave and spatially I think they're
16 consistent too based on the well logs, where the
17 wells are in relation to the ponds and the
18 waterbodies around the ponds and the
19 concentrations and that -- actions that Midwest
20 might take at this point will not change the fact
21 that the contamination is going to continue
22 because they would have to do some kind of
23 remedial action on the ash that is outside the
24 ponds.

1 Q. Can you turn to page four of this
2 report. There is a heading there that says the
3 leachate test and it continues.

4 A. Mm-hmm.

5 Q. Can you explain very briefly what
6 this section says?

7 A. Yeah, John -- John Seymour claimed
8 that the groundwater contamination at the sites
9 was not the result of ash stored in the ponds and
10 what he did was used the ASTM test to say that
11 while the ASTM 3987, the 1985 test which is what
12 the state stipulates -- stipulated to be used --

13 Q. I'm sorry. Can I pause you for a
14 second?

15 A. Sure.

16 Q. I want to make this clear for the
17 record. Can you turn to Exhibit 409 --

18 A. Yeah.

19 Q. -- in the binder. Can you describe
20 what this is?

21 MS. NIJMAN: Objection. This is the
22 first page off the Internet of an entire document
23 that is probably a 20-page document.

24 MR. RUSS: This is --

1 MS. NIJMAN: I can't cross-examine
2 based on -- it's an abstract. It's the intro to
3 the document. Where is the document?

4 MR. RUSS: Can I explain? This is
5 the full website for this test and I'm not sure --

6 MS. NIJMAN: That is not accurate.

7 MR. RUSS: I'm not asking him to
8 talk about the document. I'm asking him to talk
9 about what is on the website.

10 MS. NIJMAN: Again, I object that I
11 don't have the whole document. There is a PDF
12 symbol on the top of the document it cost \$55.
13 This is just a little Internet summary. I don't
14 know who wrote it. It's not -- it's not an
15 authentic document. It's incomplete.

16 HEARING OFFICER HALLORAN: Well, you
17 know, I think Dr. Kunkel could base any opinion
18 off even inadmissible evidence and you can cross
19 on it and, again, it goes to the weight, not the
20 admissibility. So I would -- I would overrule and
21 you may proceed, Mr. Russ.

22 MR. RUSS: Thank you.

23 BY MR. RUSS:

24 Q. Can you describe what this is,

1 Doctor?

2 A. Yes, this -- the idea of this
3 Exhibit 409 is to show that ASTM 3987-85 which is
4 I guess published by -- most recently by ASTM in
5 2004 it's a standard test method for shake
6 extraction of solid waste with water and right
7 below it in red it says superceded -- or in black
8 it says superceded and then it says click for the
9 active standard. So all I want to show is this
10 test is now out of date and we need to use the
11 2012 version.

12 Q. Can you turn to Exhibit 410 in your
13 binder?

14 A. Mm-hmm.

15 MS. NIJMAN: Same objection to this
16 exhibit, Mr. Hearing Officer.

17 HEARING OFFICER HALLORAN: What
18 exhibit are we on now?

19 MR. RUSS: Four-ten. The next one.

20 MS. NIJMAN: It's also a two-page
21 Internet sheet.

22 HEARING OFFICER HALLORAN: Same
23 ruling. You may proceed. Overruled.

24

1 BY MR. RUSS:

2 Q. Can you describe what this is,
3 Doctor?

4 A. If you had clicked on for active
5 standard back in --

6 MS. NIJMAN: Objection. Now, he is
7 testifying as to the active standard which I don't
8 have.

9 THE WITNESS: That's this, the
10 active standard ASTM 3987-12. That's Exhibit 410.

11 MS. NIJMAN: Correct. But if the
12 witness is going to testify about the active
13 standard that we don't have, I am objecting.

14 MR. RUSS: Can I clarify?

15 HEARING OFFICER HALLORAN: Yes, you
16 may.

17 BY MR. RUSS:

18 Q. Dr. Kunkel, when you said click,
19 what were you referring to clicking on?

20 A. Clicking on this little red thing
21 here on the Internet. It says "Click for active
22 standard."

23 Q. On which exhibit?

24 A. On Exhibit 409. It would have taken

1 you to what is shown on 410. It says active
2 standard.

3 MS. NIJMAN: Again, I --

4 BY THE WITNESS:

5 A. And you would have been able to
6 download that.

7 HEARING OFFICER HALLORAN: Ms.
8 Nijman?

9 MS. NIJMAN: Same objection. I have
10 no way of doing that now. He can say I could have
11 gotten it and I could have done it, but that's not
12 my obligation as the respondent to do that.

13 HEARING OFFICER HALLORAN: Mr. Russ?

14 BY MR. RUSS:

15 Q. Are you -- when you say you clicked,
16 where would it have taken you?

17 A. Well, it would have taken me to 410,
18 but that's not the point. The point is what I
19 list on page 4 of 14 in my report, which is
20 Exhibit 407 page 4 is a summary of that active
21 standard. Now, I reference that standard and I
22 guess if the defendants want to see the document
23 they can see it, but the point is that the
24 procedure now, ASTM's procedure for the shake

1 test, has some caveats in it that weren't in
2 previous -- the previous version and it's
3 important because it says that the standard, the
4 ASTM 3987, is intended as a rapid means of
5 obtaining an extract of solid waste and that would
6 include coal ash, municipal solid waste, hazardous
7 waste. It's a very common test that's used. And
8 the extract may be used to estimate the release of
9 contaminants of solid waste under laboratory
10 conditions described in the ASTM procedure.

11 This procedure is not intended
12 to provide an extract that is representative of
13 actual leachate, okay, produced from the solid
14 waste in the field or produced extracts to be used
15 as a sole basis for engineering design. And,
16 thirdly, 4.3 on that bullet, third, this practice
17 is not intended to simulate site specific leachate
18 conditions and in my report we have been using as
19 best we can site specific leachate for background
20 and actual field data to look at concentrations in
21 the groundwater and it has not been demonstrated
22 by this test that you can simulate actual disposal
23 of site leachate conditions.

24 MR. RUSS: Just to clarify, I don't

1 know if we had a ruling on the objection about the
2 hyperlink. So --

3 HEARING OFFICER HALLORAN: Well, it
4 hasn't been offered yet, but I think Dr. Kunkel
5 can give his opinion on these two.

6 THE WITNESS: Yeah, I have. I just
7 read my opinion that the test that's been used by
8 Midwest to claim that they're not contaminating
9 the groundwater and that the results of
10 concentrations in the groundwater are not the
11 result of ash stored in the lined ponds used the
12 incorrect test. That it -- it's an indicator, but
13 it in no way is intended to simulate site specific
14 leachate.

15 (Documents marked as
16 Complainants Exhibit No.'s
17 409-410 for identification.)

18 MR. RUSS: Thank you. I move to
19 introduce Exhibit's 409 and 410.

20 HEARING OFFICER HALLORAN: Ms.
21 Nijman?

22 MS. NIJMAN: Incomplete, a brief
23 summary and I'm unable to assess the scope of the
24 witness's testimony. Prejudicial.

1 HEARING OFFICER HALLORAN: Sustained
2 on that. I'll take it as an offer of proof. I'll
3 take Exhibit 409 and 410 as an offer of proof.

4 MR. RUSS: Can we have a moment?

5 HEARING OFFICER HALLORAN: Yes, you
6 may. We're off the record.

7 (Whereupon, a break was taken
8 after which the following
9 proceedings were had.)

10 HEARING OFFICER HALLORAN: We're
11 back on the record.

12 MR. RUSS: Can we clarify
13 Dr. Kunkel's testimony will be part of the record?

14 HEARING OFFICER HALLORAN: Yes.

15 MR. RUSS: Okay. Thank you.

16 HEARING OFFICER HALLORAN: But the
17 Exhibit's 409 and 410 is not admitted --

18 MR. RUSS: Okay.

19 HEARING OFFICER HALLORAN: -- are
20 not admitted.

21 MR. RUSS: That's fine. I move to
22 introduce Exhibit 407 to the record Dr. Kunkel's
23 December 8th, 2015, expert report.

24 MS. NIJMAN: Again, to the extent

1 the board wants the expert reports in the record,
2 I don't have an objection.

3 HEARING OFFICER HALLORAN: Thank
4 you, Ms. Nijman. Complainants' Exhibit 407 is
5 admitted.

6 (Document marked as Complainants
7 Exhibit No. 408 for
8 identification.)

9 BY MR. RUSS:

10 Q. Can we now turn to Exhibit 408.
11 It's the next one in the binder.

12 Dr. Kunkel, can you explain what
13 this is?

14 A. This is my rebuttal report to
15 temporal ten -- temporal trend testing result
16 notes by John Seymour dated March 16th, 2016.

17 Q. Can you explain what you were
18 writing this report for?

19 A. Yes, this is -- was a supplemental
20 report that came about during notes that were
21 provided to us by Midwest when John Seymour
22 performed his temporal ten -- trend testing result
23 notes dated 29 February 2016 and were given as an
24 exhibit of his deposition in this case.

1 Q. What were your conclusions related
2 to those tests?

3 A. That I felt that the tests violated
4 commonly, I guess, understood statistical rules
5 that long-term trend tests are much more
6 complicated than simple linear regression analyses
7 and things like that. So my rebuttal indicated
8 that changes in laboratories or laboratory
9 analytical methods and procedures might be an
10 issue if we're looking at statistical trend tests,
11 variations due to seasonal and other cycles, and
12 we know that there are seasonal cycles here in all
13 four sites due to primarily weather conditions,
14 rising and falling ground levels and then data
15 that will be correlated, one data point with
16 another.

17 In other words, the data we took
18 in this quarter would be correlated with the data
19 that we took in the next quarter, et cetera, et
20 cetera. They would be dependent upon each other.
21 So the simple test that Mr. Seymour used wouldn't
22 be valid and I recommended additional tests or
23 different tests, statistical tests which would be
24 acceptable.

1 Q. What were those different
2 statistical tests?

3 A. Well, first of all, they have to be
4 non-parametric tests which means --

5 MS. NIJMAN: I'm just going to
6 object. Where are the recommendations?

7 THE WITNESS: On discussion, on page
8 two of three.

9 MR. RUSS: Yeah.

10 HEARING OFFICER HALLORAN: You may
11 proceed.

12 BY THE WITNESS:

13 A. And the test I recommend is a
14 non-parametric test and a non-parametric test,
15 excuse me, are statistical tests which are
16 independent of the underlying probability
17 distribution which caused the data to occur in the
18 first place and we typically in hydrology have no
19 idea what that underlying probability distribution
20 is.

21 The other problem is we don't
22 know if it's from a normal -- if those samples
23 were from a normal distribution or not and so
24 typically hydrologic data are not normally

1 distributed, they're skewed and so we use
2 non-parametric tests and the one I recommend is
3 the Mann-Kendall Test and I reference Gilbert,
4 Dick Gilbert, Richard Gilbert, who has a very good
5 treatise in his textbook on Mann-Kendall test.
6 There is also a whole myriad of USGS references on
7 statistical testing that also recommends these
8 kinds of non-parametric tests.

9 This -- the Mann-Mandell test
10 was also used at Waukegan by URS to do trend
11 analysis and I agreed with their analysis in
12 Waukegan. So we would be right to use that test
13 at the other sites as well.

14 HEARING OFFICER HALLORAN: Can you
15 speak up?

16 BY THE WITNESS:

17 A. We would be right to use that test
18 at the other sites as well.

19 HEARING OFFICER HALLORAN: Thank
20 you.

21 BY MR. RUSS:

22 Q. The next paragraph talks about an
23 additional criticism, can you explain what that
24 says?

1 A. The linear regression?

2 Q. Yes.

3 A. I've already talked about that a
4 little bit and I said the reason the linear
5 regression probably shouldn't be used in this case
6 is because of the problems associated with
7 seasonal cycles, primarily at this site, possibly
8 changes in detection limits, correlated data, this
9 kind of -- those kinds of things.

10 Q. And I made a mistake. I actually
11 was -- I was thinking about a different section of
12 this.

13 Can you look at the last three
14 or four lines of the second full paragraph on that
15 page.

16 A. One of the most commonly used trend
17 tests, Mann-Kendall?

18 Q. No, the sentence that begins "Even
19 in the data."

20 A. Oh, I'm sorry. The second --

21 Q. Second full paragraph.

22 A. That starts with "For a linear
23 regression technique"?

24 Q. That paragraph, but down near the

1 bottom of the sentence.

2 A. What I wrote is I said even if the
3 data, and I still believe this, were suitable for
4 a linear regression analysis, a T-test must be
5 utilized to test the true slope that the
6 regression line is not different from zero. In
7 other words, we have to actually do a test on the
8 regression slope and test whether it's different
9 from zero or not different from zero if we accept
10 the no hypothesis or not.

11 And so since Seymour,
12 Mr. Seymour, didn't do that my opinion was that
13 comparing the calculated standard error to the
14 calculated slope is not a valid basis for
15 concluding that there is no temporal trend.

16 MR. RUSS: I move to introduce
17 Exhibit 5- -- 407 into the record.

18 HEARING OFFICER HALLORAN: 408?

19 MR. RUSS: Yes, I'm sorry. 408.

20 HEARING OFFICER HALLORAN: Ms.
21 Nijman?

22 MS. NIJMAN: Same limitation. It's
23 not usually permissible, but I understand in this
24 proceeding the board appreciates it. So, no

1 objection.

2 HEARING OFFICER HALLORAN: Thank
3 you. The record will so note. Complainants'
4 Exhibit 408 is admitted.

5 MR. RUSS: Now, I just have one more
6 exhibit to talk about. This is the one we were
7 talking about earlier. It's going to take me a
8 minute to figure out what the exhibit number is,
9 but I'm going to hand out these large format
10 engineering drawings.

11 MS. NIJMAN: It's 100, Abel.

12 MR. RUSS: It's Exhibit 100. Thank
13 you.

14 MS. NIJMAN: You're welcome. Thank
15 you very much.

16 BY MR. RUSS:

17 Q. Doctor, do you remember seeing this
18 drawing?

19 A. Yes.

20 Q. Can you explain what it is?

21 A. This is the drawing that was in the
22 Valdes Engineering report submitted to Midwest and
23 it's an approved construction drawing for Waukegan
24 ash ponds.

1 Q. And does this show the bottom
2 elevation of the ash ponds?

3 A. It does.

4 Q. Where does it show that?

5 A. It shows the bottom finish grade at
6 elevation 5.0 and it's, I guess, right below the
7 center or right in between the two cross sections
8 on the west pond and between the two cross
9 sections on the north pond. It says bottom finish
10 grade elevation 5.0.

11 Q. And what is that five feet relative
12 to?

13 A. According to the notes that are over
14 on the right-hand side, it says "Notes one. The
15 elevations shown here refer to" -- I can't read
16 the exact -- refer something data to convert to
17 mean sea level at 580. I think it's 534. Yeah,
18 580.34 something.

19 Q. That's what I --

20 A. 580.5 is close enough for us for
21 now.

22 Q. So where does that put the bottom of
23 the pond?

24 A. The bottom of the pond would be

1 580.5 plus five would be 585.5 feet above mean sea
2 level.

3 Q. And you were talking earlier about
4 as-built drawings --

5 A. Yes.

6 Q. -- yesterday?

7 A. Yes.

8 Q. You explained what they were.

9 A. Yes.

10 Q. Is this an as-built drawing?

11 A. No, it's not. It clearly says
12 approved for construction, but it doesn't say that
13 the ponds were actually built according to this
14 plan.

15 MR. RUSS: I would like to introduce
16 this as an exhibit. We don't have an exhibit
17 number. Can I make it Exhibit 100.5, half exhibit
18 number right after the exhibit that has the
19 original version of this.

20 (Document marked as Complainants
21 Exhibit No. 100.5 for
22 identification.)

23 MS. NIJMAN: No objection.

24 HEARING OFFICER HALLORAN: Okay.

1 Thank you. Yeah, it's admitted or I'll mark it as
2 Complainants' Exhibit -- what is it -- 100.5.

3 MR. RUSS: One last thing I'd like
4 to clear up. Going back to Exhibit -- I'm sorry.
5 It was that EPRI website Exhibit 403.

6 HEARING OFFICER HALLORAN: Yes.

7 MR. RUSS: I believe you struck his
8 testimony related to this.

9 MS. BUGEL: That was a motion to
10 strike.

11 MR. RUSS: Motion to strike his
12 testimony.

13 MS. NIJMAN: My understanding,
14 Mr. Hearing Officer, is that my notes reflect that
15 you allowed it as an offer of proof only. Same
16 decision as you did with the other website
17 abstracts.

18 HEARING OFFICER HALLORAN: No, I
19 accepted his testimony, but I took -- yeah, but
20 I -- it looks like I was inconsistent on this one,
21 correct. It looks like I took his testimony
22 regarding this as an offer of proof.

23 MS. NIJMAN: Correct, I think that's
24 consistent with what you just did with the other

1 ones.

2 HEARING OFFICER HALLORAN: Well, no,
3 I let his testimony into the record. The
4 documents themselves, the exhibits, I took as an
5 offer of proof.

6 MS. BUGEL: Hearing Officer, if I
7 may jump in, our concern is that the expert's
8 testimony is admissible because the expert may
9 rely on things that aren't in evidence. So we
10 just wanted to make sure our argument that his
11 testimony is admissible is on the record so we
12 preserve our rights and should there be
13 post-hearing motions we simply want to make it
14 clear that his testimony is admissible because
15 experts can rely on things that aren't in
16 evidence.

17 HEARING OFFICER HALLORAN: Thank
18 you, Ms. Bugel, and that's what I ruled in Exhibit
19 407 -- excuse me -- 409 and 410 and I'd like to be
20 consistent because I think that's the correct
21 ruling. So I will change my ruling on
22 Complainants' Exhibit 403 and allow the testimony
23 in -- into evidence and not as an offer of proof,
24 but the document itself is taken as an offer of

1 proof.

2 MR. RUSS: Thank you. And I have no
3 further questions.

4 HEARING OFFICER HALLORAN: Okay.
5 Give me a minute, please.

6 Ms. Nijman, is this a good time
7 to take a break to collect -- well, collect
8 everybody's thoughts --

9 MS. NIJMAN: It is.

10 HEARING OFFICER HALLORAN: -- before
11 cross? Ten -- excuse me. Fifteen, 20 minutes
12 we'll be back. Thank you. We're off the record.

13 (Whereupon, a break was taken
14 after which the following
15 proceedings were had.)

16 HEARING OFFICER HALLORAN: We're
17 back on the record. It is approximately 10:55.
18 Ms. Nijman from Midwest is starting her cross of
19 Dr. Kunkel. Ms. Nijman?

20 MS. NIJMAN: Thank you, Mr. Hearing
21 Officer.

22 C R O S S E X A M I N A T I O N

23 BY MS. NIJMAN

24 Q. Dr. Kunkel, before we really begin,

1 I just want to clarify some of the things you
2 talked about this morning so that I can be clear
3 in my mind as we go forward. Okay?

4 A. Yes.

5 Q. When you were testifying this
6 morning about the Waukegan site, you identified an
7 ash slag storage area, do you recall that?

8 A. Yes.

9 Q. Midwest Gen didn't place ash in that
10 area, correct?

11 A. I don't know.

12 Q. Well, you identified that area based
13 on the ENSR report from 1998, correct?

14 A. Correct.

15 Q. Okay. So that was before Midwest
16 Gen purchased the stations, correct?

17 A. That ash-like storage area was
18 identified as part of a report by ENSR done for
19 Commonwealth Edison, that is correct.

20 Q. And that was before Midwest
21 Generation was there?

22 A. I don't know when Midwest came there
23 exactly.

24 Q. You also talked about -- for several

1 of the sites this morning, you talked about logs
2 that you looked at in berms, do you recall that,
3 berms around the ponds?

4 A. We didn't have logs in berms. We
5 had logs next to berms.

6 Q. Or right at the berms I think you
7 said was --

8 A. The toe of the berm, yes.

9 THE COURT REPORTER: Wait.

10 BY MS. NIJMAN:

11 Q. We need to speak one at a time. And
12 the berms are structural, correct?

13 A. Yes.

14 Q. You also mentioned as to Waukegan
15 when the ponds were relined Mr. Russ was talking
16 about the confusion that you had initially in your
17 report about the 2002 date, you had thought that
18 maybe they were relined in 2002 and then again in
19 2003 and 2004, originally that was your opinion in
20 your first report, correct?

21 A. Correct.

22 Q. And you realized that that was
23 wrong, correct?

24 A. Correct.

1 Q. And, in fact, I identified that
2 error for you during your deposition, correct?

3 A. Yes.

4 Q. Also, on Waukegan, you mentioned two
5 possible sources of coal ash constituents in the
6 groundwater and you did not mention the ponds,
7 correct?

8 A. That was an oversight. The ponds
9 are also a potential source of groundwater
10 contamination.

11 Q. So you're adding that now?

12 A. Yes.

13 Q. And Will County when you spoke about
14 Complainants' Exhibit 36 the data tables from
15 Mr. Frenndt and e-mail from Mr. Frenndt at Patrick
16 to Maria Race, do you remember that document?

17 A. Yes.

18 Q. Those -- that e-mail was from 2011
19 you identified, correct?

20 A. I don't remember. I believe so.

21 Q. And that was based on one set of
22 data only, correct?

23 A. I'm not sure. Patrick collected
24 several quarters of data in 2011. It could have

1 been one, it could have been two.

2 Q. But it was a very preliminary --

3 A. Yes --

4 Q. -- discussion?

5 A. -- it was preliminary.

6 Q. You mentioned several times, quote,
7 high levels of boron or high levels of sulfate.

8 You're defining high as anything
9 above background, is that correct?

10 A. I have two -- two criteria;
11 background and the Illinois Class 1 groundwater
12 quality standards.

13 Q. I understand. Could you -- the
14 question I have, though, is is high for you
15 anything above background?

16 A. It could be either. For me, if
17 there is contamination, it's above background.
18 Background defines contamination for me.

19 Q. Correct. But you use the word high,
20 is high above background?

21 A. It's above background, but it could
22 also be above the Illinois pollution groundwater
23 quality standards.

24 Q. I understand, sir, but I just want

1 an answer to when you use the word high it's above
2 background, correct?

3 A. Yes.

4 Q. Thank you. You also mentioned at
5 Will County if the ponds were lined and drained
6 there could be hydrostatic uplift, do you recall
7 that?

8 A. Yes.

9 Q. You have no knowledge of them ever
10 being drained, correct?

11 A. Certainly. 1N and 1S are currently
12 drained.

13 Q. So because the water is out of them,
14 you're suggesting there could be hydrostatic
15 uplift?

16 A. On the liners, yes.

17 Q. You're aware that there is still
18 poz-o-pac beneath those?

19 A. Absolutely.

20 Q. And you're aware that there is a
21 warning sand layer on top of the liner?

22 A. Yes.

23 Q. And wouldn't that sand layer prevent
24 the uplift?

1 A. No, not necessarily. It depends on
2 how high the water levels get as to the uplift
3 pressures.

4 Q. And you're aware there is at least
5 one foot of water still remaining with the ash in
6 those ponds, correct?

7 A. I'm not aware of that, no.

8 Q. You're not aware of that?

9 A. I'm not aware of that, no.

10 Q. When you were talking this morning
11 about the ASTM standards 3987, do you recall that?

12 A. Mm-hmm.

13 Q. And they're marked as Exhibit 409
14 and 410. You base your opinions as to the test
15 3987 on those two abstracts, correct?

16 A. And my experience using those tests
17 in the past.

18 Q. Your testimony this morning was
19 specific as to words. You read into the testimony
20 words from the abstract, correct? You can look at
21 409 and 410 if you like, but my question is simply
22 you were relying only on those abstracts for the
23 forming of your opinions about the test data?

24 A. No, that's not my only -- I have

1 seen the documents.

2 Q. You have the actual tests?

3 A. Yes, they don't belong to me. They
4 belong to the consulting firm for whom I work.

5 Q. When was the last time you reviewed
6 them?

7 A. I left in 2013. So it's been four
8 years.

9 Q. So when you were talking this
10 morning, though, you were reading from Exhibit
11 410, you were reading from use limitations,
12 remember?

13 A. Yes.

14 Q. And you then compared that to the
15 abstract in Exhibit 409?

16 A. Yes.

17 Q. And you said that the use
18 limitations did not exist in Exhibit 409, the
19 earlier abstract, correct?

20 A. That's correct, but that wasn't the
21 point of the whole exercise.

22 Q. I understand.

23 A. Okay.

24 Q. Let's keep going here on this train

1 because I'm trying to clarify this for you.

2 You based that opinion of those
3 standards and uses on the abstracts that are in
4 front of you, correct?

5 MR. RUSS: Object. Asked and
6 answered.

7 HEARING OFFICER HALLORAN:
8 Overruled.

9 BY THE WITNESS:

10 A. My opinion is based on --

11 BY MS. NIJMAN:

12 Q. Just as to the standards and the
13 uses testimony from this morning, that's all I'm
14 asking about.

15 A. The standards and uses testimony are
16 while the words came out of the abstract, it's
17 certainly something that I agree with and have
18 used tests in the past to show that, in fact, the
19 ASTM test is not applicable to the cases we have
20 here.

21 Q. I understand.

22 A. Okay.

23 Q. And the reason you're saying that is
24 because you were looking at these abstracts which

1 is all we have in front of us right now, all you
2 do have in front of you --

3 MR. RUSS: Object. Not a question.

4 HEARING OFFICER HALLORAN: I'm
5 sorry?

6 MR. RUSS: There is no question
7 there.

8 MS. NIJMAN: I'm working on it.

9 HEARING OFFICER HALLORAN: Ms.
10 Nijman is just trying to qualify, I guess, clarify
11 the question for Dr. Kunkel. You may proceed.

12 BY MS. NIJMAN:

13 Q. I'm trying to simply clarify that
14 the standard and use limitation from the 2012
15 document you said didn't appear in the prior 2004
16 version, correct?

17 A. I don't believe it did.

18 Q. Okay. Well, you, in fact, said it
19 didn't, correct?

20 A. I don't remember. I think so, yeah.

21 Q. That's different testimony. Did the
22 standard and use limitations appear in 2004?

23 A. To the best of my knowledge, it
24 didn't.

1 Q. And that's based on the abstracts
2 you showed today?

3 A. No, that's based on my experience
4 with those two documents in the past.

5 Q. Okay. You gave some testimony
6 about -- about your rebuttal report, Exhibit 407,
7 and actually -- I'm sorry. Exhibit 408, the
8 rebuttal to the temporal testing.

9 Now, you understand that
10 Exhibit -- excuse me -- that the temporal testing
11 notes that were done by Mr. Seymour were in
12 response to your rebuttal report of December 8th,
13 2015, do you recall that?

14 A. That's not my understanding of the
15 notes that Mr. Seymour wrote.

16 Q. Okay. Well, take a look at your
17 exhibit -- I think what has been marked as Exhibit
18 407 in your binder.

19 A. Yeah.

20 Q. At page 10. And do you see in the
21 middle of the page numbers one, two, three and
22 four?

23 A. Oh, 407, but that's not --

24 Q. Exhibit 407.

1 A. All right.

2 Q. This is your report. Your report of
3 December 8th of 2015. It's up on the screen as
4 well if you're having trouble.

5 A. I thought we were talking about
6 Exhibit 4- --

7 Q. We'll get there.

8 A. Okay.

9 Q. I just need to give you a little
10 background.

11 A. Okay.

12 Q. Okay. See those four bullets.
13 Those are from your report and you discussed how
14 you believed concentrations were either increasing
15 or decreasing at various wells, do you see that?

16 A. Yes.

17 Q. And we talked about that in your
18 deposition, I believe?

19 A. Yes.

20 Q. And you based those estimates on an
21 eyeball, right, I think is what you told me?

22 A. Yes.

23 Q. Okay. You didn't do a Mann-Kendall
24 test?

1 A. No.

2 Q. You didn't do a linear regression or
3 standard test? It was on your eyeball?

4 A. Yes.

5 Q. In fact, the demonstratives that you
6 provided us with yesterday and today all those
7 pretty graphs on the demonstratives where you told
8 us whether things were increasing or decreasing --

9 A. Yes.

10 Q. -- those were also based on an
11 eyeball, correct?

12 A. Yes.

13 Q. No Mann-Kendall?

14 A. No.

15 Q. No statistical linear analysis?

16 A. No.

17 Q. Okay. So all of the discussions
18 that you were -- or concerns that you had about
19 Mr. Seymour actually doing a linear analysis would
20 apply doubly given that you just eyeballed,
21 correct?

22 A. I don't understand the question.

23 Q. You would agree, wouldn't you, that
24 the linear analysis done by Mr. Seymour is better

1 than an eyeball, correct?

2 A. I guess I have to qualify that by
3 saying better, but it may lead to acceptance of
4 the no hypothesis and it might be an erroneous
5 conclusion.

6 Q. Similar to your eyeball estimate?

7 A. Not different from my eyeball
8 estimate.

9 Q. Okay. The other thing I wanted to
10 ask about your demonstratives before we go on is
11 you assisted in preparing them, I presume, the
12 demonstrative exhibits?

13 A. I prepared them myself.

14 Q. Okay. And also the table of data
15 that was provided this morning again and the
16 charts, summary charts at the end of the
17 demonstratives you prepared all those?

18 A. No.

19 Q. You did not prepare those?

20 A. I did not prepare them.

21 Q. You assisted in preparing them?

22 A. I reviewed the final document, yeah.

23 Q. So you reviewed and relied on them
24 for your opinions?

1 A. This morning, yes.

2 Q. Your opinions from this morning?

3 A. Yes.

4 Q. But you've reviewed and relied on
5 them before today?

6 A. Not exactly in that form, but, yes,
7 I have. Those are the data from Midwest Gen.

8 Q. Okay.

9 A. And I've relied on that data
10 consistently for all my analyses and opinions.

11 Q. Okay. And so the data in this table
12 marked as pages 1 through 37 is the data that
13 informs the rest of your opinions, correct?

14 A. Yes.

15 Q. Now, I can get started. Now, your
16 CV says you've been working on your own since
17 about 2013, correct?

18 A. Yes.

19 Q. And as I understand it, you work out
20 of your home?

21 A. Yes.

22 Q. And you work -- you have no
23 associates working with you?

24 A. No.

1 Q. Now, in the past, you have worked
2 for several different larger consulting firms,
3 correct?

4 A. Yes.

5 Q. And when you're at those larger
6 environmental consulting firms, when you prepare a
7 report let's say for a client, there is a quality
8 assurance process, correct?

9 A. Yes.

10 Q. And, in fact, that process requires
11 that another engineer or a senior person in that
12 office reviews the work before it goes out the
13 door, correct?

14 A. Yes.

15 Q. And when you're on your own, you
16 don't have that review process, correct?

17 A. Correct.

18 Q. Much of your professional experience
19 is in the mining industry, correct?

20 A. Yes.

21 Q. And you spent, in fact, I think you
22 told me in the deposition we -- we had together
23 that you spent about 60 to 70 percent of your
24 career working on hard rock mining cases, correct?

1 A. Yes.

2 Q. And yesterday you talked about some
3 coal ash -- some recent coal ash experience.

4 Isn't it true that the last time
5 you actually designed a coal ash pond was in the
6 late 1970's?

7 A. Yes.

8 Q. And you are not a professional
9 engineer in the State of Illinois, correct?

10 A. Correct.

11 Q. And you have never taken a property
12 through the Illinois Site Remediation Program?

13 A. No.

14 Q. And you have a limited understanding
15 of what a groundwater management zone does in
16 Illinois?

17 A. Limited, yes.

18 Q. You're not familiar with how it
19 works in Illinois, correct?

20 A. No.

21 Q. And the concept of a CCA is also, in
22 Illinois, not familiar to you, correct?

23 A. Correct.

24 Q. What does CCA stand for? You can

1 say you don't know if you don't know.

2 A. I can't remember exactly. I've
3 certainly read it several times.

4 Q. As to your recent experience in coal
5 ash ponds in your CV, one of the matters that you
6 talked about is the Little Blue Run facility in
7 Pennsylvania, do you recall that?

8 A. West Virginia, Pennsylvania, yes.

9 Q. And that case involved a completely
10 unlined pond, correct?

11 A. Correct.

12 Q. And, in fact, it was an unlined pond
13 for fly ash, correct?

14 A. Correct.

15 Q. In fact, it was probably the largest
16 fly ash pond in the United States unlined,
17 correct?

18 A. Correct.

19 Q. And so there was no liner system for
20 you to assess in that case, correct?

21 A. Correct.

22 Q. Now, the other coal ash case that
23 you had experience with is in Montana you
24 mentioned?

1 A. Yes.

2 Q. That's the, quote, Montana
3 Environmental Information Center, Sierra Club and
4 National Wildlife Federation versus the Montana
5 Department of Environmental Quality and Talen
6 T-A-L-E-N, Montana, that's the case?

7 A. Yes.

8 Q. And Sierra Club is also a plaintiff
9 in that case?

10 A. Yes.

11 Q. Now, Talen Montana is a utility
12 company?

13 A. It's a utility.

14 Q. And yesterday you said you reviewed
15 the as-built documents in the Colstrip case, the
16 Montana case -- let me back up.

17 You called the Montana case also
18 the Colstrip case, correct?

19 A. Correct.

20 Q. So yesterday you said you reviewed
21 as-built drawings in that case?

22 A. Yes.

23 Q. And that that was very important to
24 review the as-builts, correct?

1 A. Yes.

2 Q. They're the final construction
3 drawings of a project?

4 A. Yes.

5 Q. And they would show how a project
6 was actually built is what you said?

7 A. Yes.

8 Q. Now, there are times that the
9 as-built drawings would then differ from the
10 design or not for construction drawings, correct?

11 A. Correct.

12 Q. And things in construction get
13 changed, correct?

14 A. Correct.

15 Q. And you said anyone reviewing
16 drawings should review the as-builts to get an
17 accurate picture of what a project looks like,
18 correct?

19 A. Of what was constructed actually was
20 constructed for the project, yes.

21 Q. Now, in the Montana case, you gave
22 many of the same opinions there that you gave in
23 this case, correct?

24 A. Correct.

1 Q. And you opined that their ash ponds
2 likely leaked just like in this case?

3 A. Correct.

4 Q. And you said there could be liner
5 construction defects there just like in this case,
6 correct?

7 A. Yes.

8 Q. And you said there could be tears
9 and liner failures that couldn't be seen just like
10 in this case, correct?

11 A. Yes.

12 Q. And you were deposed in that case,
13 do you recall that?

14 A. Yes.

15 Q. And do you recall the deposition was
16 on -- you may not recall the specific date. It
17 was on September 21st of 2015.

18 A. Yes.

19 Q. So that deposition was after your
20 report was filed in this case, correct?

21 A. Yes.

22 Q. Your report -- your first report in
23 this case was July of '15, you were deposed in the
24 Talen case, in the Montana case, in September of

1 2015?

2 A. Correct.

3 Q. Now, you've opined in the Montana
4 case that hydrostatic uplift would occur at the
5 Talen Energy ponds, do you recall that --

6 A. Yes.

7 Q. -- testimony? And you've also
8 opined in this case that hydrostatic uplift would
9 occur, is that correct?

10 A. Could occur, yes.

11 Q. Could occur. You don't know?

12 A. It's very complex. I'd have to have
13 more information on the specific pond.

14 Q. Okay. So it's very pond-specific
15 as --

16 A. Yes.

17 Q. -- to whether hydrostatic -- I'm
18 sorry. You have to wait.

19 It's very pond specific as to
20 whether hydrostatic uplift could occur, correct?

21 A. Yes.

22 Q. And when you were deposed -- when I
23 deposed you, you said -- actually, this is in your
24 report. Your July '15 report says it and we

1 talked about it at the deposition. Let's go
2 backwards.

3 In your July 2015 report, you
4 said that the reason you think hydrostatic uplift
5 could occur for Midwest Generation ponds is
6 because of your personal experience at the
7 Colstrip case?

8 A. That's one reason plus education and
9 experience with other ponds.

10 Q. Well, let's look at your report.
11 Your report is at Exhibit -- the July 1st, 2015,
12 report. This is Exhibit 401 and if you turn to
13 page ten of the report and the last full
14 paragraph. I may have pulled out the wrong
15 report, but let's look -- we talked about it again
16 at your deposition.

17 Do you recall you were
18 deposed -- I deposed you in March of 2016, right?

19 A. Yes.

20 Q. And, of course, like any deposition
21 you swore to tell the truth at that deposition?
22 Yes?

23 A. Yes.

24 Q. And in your deposition, I asked you

1 for your basis for your statement that there was a
2 plastic liner failure at the Talen facility?

3 A. Yes.

4 Q. And you referred me to the expert
5 report in that case, correct?

6 A. I'm not -- I don't understand the
7 question. Are we talking about hydrostatic uplift
8 failure?

9 Q. Yes.

10 A. Okay. There was a hydrostatic
11 uplift failure.

12 Q. At Talen?

13 A. At Talen. And it was in my Talen
14 report which you have and in my deposition, Talen
15 deposition, that you also have.

16 Q. Okay. Good. We have the -- as you
17 mentioned, we have the Talen report and the Talen
18 deposition.

19 Now, ultimately when you were
20 deposed in the Talen case, there wasn't actually
21 any evidence of hydrostatic uplift, correct?

22 A. Wrong. Incorrect. It was
23 well-documented that that pond failed due to
24 hydrostatic uplift by Talen and then that pond was

1 taken out of service.

2 Q. Okay. I'm going to refer you to
3 Complainants' Bates 53578, which is your
4 deposition in the Colstrip case.

5 HEARING OFFICER HALLORAN: Thank
6 you. What exhibit is this or no exhibit?

7 MS. NIJMAN: Yeah.

8 HEARING OFFICER HALLORAN: Thank
9 you.

10 MS. NIJMAN: As cross.

11 BY MS. NIJMAN:

12 Q. So at page 29 of the deposition
13 pages. We also have it up on the screen for you.
14 So starting at line 18 it says -- and that would
15 be by the attorney in that case.

16 Q. I'm sorry. I may have
17 misunderstood a minute ago. I thought -- did you
18 tell me that you reviewed documents showing
19 hydrostatic uplift at one of the impoundments near
20 the plant site?

21 Answer -- and that would be by
22 you, Dr. Kunkel.

23 A. Yes. Yes.

24 Q. Which document is that?

1 A. I'll have to go through and
2 see. It may be in one of the plant site reports
3 since I concentrated primarily on just the three
4 ponds for their construction, but there were a lot
5 of other information in those reports I
6 reviewed -- three site reports.

7 Q. Was this location where you
8 think you saw hydrostatic uplift at the plant
9 site, was that one of the three ponds you
10 analyzed?

11 A. I don't believe so, no.

12 Q. Was it a clay lined pond?

13 A. I don't know.

14 Q. Did it have a synthetic
15 liner?

16 A. I don't think so.

17 Q. So it had some sort of an
18 earthen liner?

19 A. I'm not sure. It was prior
20 to any lining probably of any of the ponds at the
21 plant site, but since the water table tends to be
22 high at the plant site after synthetic liners are
23 placed, it's important to recognize high water
24 tables don't agree well with plastic liners.

1 Q. Specifically -- and
2 specifically if you can't find the document right
3 now, what do you remember this document saying
4 about hydrostatic uplift causing problems at the
5 plant site impoundment?

6 A. I don't know that it ever
7 said it caused plant problems. What it did is it
8 said something to the effect of groundwater table
9 is above the pond level and that is a hydrostatic
10 uplift condition. So there was no mention by
11 Talen that it actually caused liner failure or how
12 long it lasted or anything like that, it was a
13 single observation.

14 Q. So the document you saw
15 simply said the groundwater table was higher than
16 the surface of the pond?

17 A. Yes.

18 So, you see, the Colstrip
19 situation you remember that incorrectly?

20 A. No, I haven't. I think somewhere in
21 my report and in this document we talk about that
22 specific pond and the attorney asked me "But that
23 pond was taken out of service after the liner
24 failed" and I said "Yes." It's somewhere in here.

1 I would have to go through it and find it.

2 Q. Well, what we have in front of us is
3 the report that you filed for Colstrip and we have
4 the deposition and in the deposition you said you
5 found no document other than the fact that the
6 groundwater elevation was higher there.

7 A. That isn't what I remember of the
8 documents. I remember that there was a failure
9 and that pond was taken out of service and that is
10 part of the transcript with Holland & Hart
11 somewhere in here.

12 Q. I look forward to hearing from that,
13 about that from you because it's not in the
14 transcript, sir. What's in the transcript is what
15 I read to you. So it appears your memory may be
16 confused on that point.

17 MR. RUSS: Object.

18 HEARING OFFICER HALLORAN:

19 Sustained.

20 BY MS. NIJMAN:

21 Q. You testified that hydrostatic
22 uplift would occur if a pond is empty or there is
23 not enough weight on it, correct?

24 A. Correct.

1 Q. And, in fact, the existence of a
2 heavy liner like poz-o-pac could prevent
3 hydrostatic uplift, correct?

4 A. Possibly, yes.

5 Q. In the Colstrip case, they didn't
6 have any poz-o-pac, correct?

7 A. They did not.

8 Q. Now, yesterday you testified about
9 the only pond at Powerton that does not have
10 poz-o-pac and that was the ash settling secondary
11 basin, do you remember that testimony?

12 A. Yes.

13 Q. You looked at drawings to say that
14 there could be hydrostatic uplift there?

15 A. Yes.

16 Q. Now, that basin, that's a finishing
17 pond, correct?

18 A. Yes.

19 Q. And that means it would take just a
20 de minimis amount of ash, correct?

21 A. I don't know how they use the
22 finishing pond.

23 Q. You don't?

24 A. No.

1 Q. You testified yesterday we were
2 talking about Exhibit 33, which was a secondary
3 ash basin permit application.

4 Can you take a look at Exhibit
5 33 in front of you and specifically you looked at
6 the drawings on Bates page 9728.

7 HEARING OFFICER HALLORAN: I'm
8 sorry, Ms. Nijman. What was that, Exhibit 33?

9 MS. NIJMAN: Exhibit 33. Bates page
10 9728.

11 HEARING OFFICER HALLORAN: Thank
12 you.

13 BY MS. NIJMAN:

14 Q. You recognize --

15 A. Yes.

16 Q. -- that document? Yes. You talked
17 about it yesterday, do you remember?

18 A. Yes.

19 Q. Now, that's a not for construction
20 drawing, correct?

21 A. It says not for construction, yes.
22 Right at the bottom.

23 Q. And, again, we discussed the fact
24 that you need to look at as-builts, right, you'd

1 prefer to look at an as-built?

2 A. Yes.

3 Q. Okay. So when you looked at this
4 document, you talked about the elevations and
5 concluded that there could be hydrostatic uplift,
6 but you didn't know for sure, is that correct?

7 A. Yes.

8 Q. And you have not reviewed the
9 as-built drawings for the secondary ash settling
10 basin, is that correct?

11 A. No.

12 MR. RUSS: Object.

13 HEARING OFFICER HALLORAN: Yes,
14 Mr. Russ?

15 MR. RUSS: I don't believe you've
16 established that this is not an as-built drawing.

17 MS. NIJMAN: He just said it wasn't.
18 It's a not for construction drawing.

19 HEARING OFFICER HALLORAN: That's
20 what I remember.

21 MR. RUSS: But that's not not
22 as-built if you understand what I'm saying.

23 MS. NIJMAN: No.

24 MR. RUSS: Not for construction does

1 not mean that --

2 MS. NIJMAN: Is there an objection?

3 HEARING OFFICER HALLORAN: Mr. Russ,
4 you have redirect. You can rehabilitate if
5 necessary. Continue, please.

6 THE COURT REPORTER: What was the
7 answer on that?

8 BY MS. NIJMAN:

9 Q. Have you reviewed the as-built
10 drawings for the secondary ash station?

11 A. No.

12 Q. So I'm going to show you Midwest Gen
13 Bates 34158, which is a construction package for
14 the secondary ash settling basin liner replacement
15 and it goes through -- I can't read the last
16 page -- Midwest Gen Bates 34267.

17 So I've prepared both packages
18 so you can see the entire package, but I also have
19 large copies of the drawings because I'm not going
20 to reference any part of the package other than
21 the drawings, but this is to give you context.

22 MS. GALE: Mr. Hearing Officer,
23 these are the drawings on the back of that.

24 HEARING OFFICER HALLORAN: Oh, thank

1 you.

2 BY MS. NIJMAN:

3 Q. So these are drawings. So, first,
4 take a look at -- we're just going to refer to the
5 drawings at the back and so start -- so the first
6 drawing you have is Bates number 34261 and it's
7 called title sheet.

8 A. Yes.

9 Q. Can you open that one, please?

10 A. Okay.

11 Q. So on the title sheet, this shows
12 that there is a list of six drawings in this
13 package, correct?

14 A. Correct.

15 Q. And you see those funny little
16 bubbles on this?

17 A. The clouds, yes.

18 Q. Yeah. Okay. If you would read
19 under the first cloud, what does that say?

20 A. Liner subgrade preparation.

21 Q. I'm sorry?

22 A. Under the first liner subgrade
23 preparation?

24 Q. In the first cloud.

1 A. In the first cloud?

2 Q. Yes.

3 A. Underdrain subgrade elevations.

4 Q. And then under the second -- inside
5 the second cloud, what is in there?

6 A. Liner subgrade cross sections.

7 Q. Okay. And then if you turn to the
8 right, it defines what the little cloud means,
9 what does that say?

10 A. Those are changes that were made to
11 the drawings.

12 Q. So as you were saying before you can
13 have a construction or a design drawing, but then
14 it gets changed when the pond is actually built,
15 correct?

16 A. Correct.

17 Q. So these are the construction
18 drawings, correct?

19 A. They say they were issued for
20 construction and issued for bid, yes.

21 Q. Where do they say that?

22 A. Down here in the title block and
23 they give the dates.

24 Q. Issued for construction, correct,

1 that's what you're referring to?

2 A. Yes.

3 Q. Now, one of those change sheets was
4 the underdrain subgrade elevations and the
5 second -- correct?

6 A. Yes.

7 Q. And the second change you mentioned
8 was the liner subgrade cross sections?

9 A. Correct.

10 Q. And those then were changes from the
11 drawings you looked at in Exhibit 33, correct?

12 A. I don't -- I'm not sure.

13 Q. Well, let's keep going. So if you
14 turn to the underdrain subgrade elevation drawing,
15 that's at Bates 34263.

16 A. Okay.

17 Q. Now, if you look at the drawing in
18 the legend, there is a little symbol for riprap up
19 on the top right, do you see that, riprap?

20 A. Yes.

21 Q. And if you look at the drawing,
22 there is riprap placed all around the sides of the
23 basin, correct?

24 A. Yes.

1 Q. And riprap is used to drain water,
2 correct, one of its purposes?

3 A. Typically not. It's used for
4 erosion protection.

5 Q. Okay. Well, take a look in the
6 bottom right corner of this drawing. There is an
7 excavated sump hole, correct?

8 A. Yes.

9 Q. And a sump is for collecting water,
10 correct?

11 A. Correct.

12 Q. So now if you go to the drawing
13 that's Bates labeled 34265, the liner subgrade
14 cross sections, this depicts the cross sections of
15 the -- of an underdrain system, correct?

16 A. Yes, it appears to be correct.

17 Q. So this is the second -- I'm looking
18 at the title.

19 Secondary ash settling basin
20 liner replacement liner subgrade cross sections,
21 do you see that?

22 A. Yes.

23 Q. Okay. And looking at the top cross
24 section first, the east to west or the west to

1 east. So first you see the riprap, correct?

2 A. Yes.

3 Q. And then you see on the outside at
4 the base of the pond there are one -- there is
5 one-inch diameter open graded stone, correct?

6 A. Correct.

7 Q. And looking at the cross section
8 there are six four-inch diameter collection pipe
9 laterals, correct?

10 A. Yes.

11 Q. And above the riprap and the
12 one-inch diameter stone there is a layer of sand,
13 correct?

14 A. Correct.

15 Q. And above the sand is the
16 geomembrane, correct?

17 A. Correct.

18 Q. And then if you look at the south to
19 north cross section, the second one, that shows
20 the same layer, correct?

21 A. Correct.

22 Q. So according to this construction
23 drawing, the secondary ash settling basin subgrade
24 is riprap on all sides, correct?

1 A. Correct.

2 Q. One-inch diameter open graded stone,
3 correct?

4 A. Correct.

5 Q. Six four-inch diameter pipes with
6 open graded stone?

7 A. Correct.

8 Q. A layer of sand?

9 A. Correct.

10 Q. Covered that by a geomembrane?

11 A. Yes.

12 Q. So that is showing, is it not, an
13 engineered underdrain system beneath the HDPE
14 liner at the secondary ash basin?

15 A. It is.

16 Q. Now, thinking about how this basin
17 is oriented, the Illinois River is to the north,
18 correct?

19 A. Correct.

20 Q. And so that would make sense that
21 the six four-inch pipes are oriented to drain to
22 the north, correct?

23 A. Correct.

24 Q. And the purpose of the underdrain

1 system to quickly move water away from the HDPE
2 liner?

3 A. Groundwater, yes.

4 Q. So that protects the liner, correct?

5 A. Correct.

6 Q. And so this -- isn't it true that
7 this system is specifically designed to prevent
8 the uplift you were talking about?

9 A. It is.

10 Q. Now, I think we discussed a few
11 minutes ago that -- well, all three ponds at
12 Joliet have poz-o-pac beneath them, correct?

13 A. I believe that's correct, yes.

14 Q. And it's about 12 inches of
15 poz-o-pac, do you recall?

16 A. If I remember correctly, when they
17 were lined with HDPE part of the poz-o-pac was
18 removed.

19 Q. Correct. And then 12 inches
20 remained?

21 A. Remained, that's correct.

22 Q. Let's take a look at the
23 demonstratives that we had sent for the Joliet
24 site.

1 MS. NIJMAN: We provided these.
2 They were previously produced, but we have another
3 copy.

4 MS. GALE: Here you go, Mr. Hearing
5 Officer.

6 HEARING OFFICER HALLORAN: Thank
7 you.

8 BY MS. NIJMAN:

9 Q. So looking at the close up, the
10 third page or the second page, I believe.

11 MR. RUSS: Can I object?

12 HEARING OFFICER HALLORAN: Sure.

13 MR. RUSS: I don't believe
14 Dr. Kunkel has had a chance to look at these until
15 right now.

16 HEARING OFFICER HALLORAN: Ms.
17 Nijman?

18 MS. NIJMAN: That's fine. I'm just
19 going to ask him questions about it.

20 HEARING OFFICER HALLORAN: Do you
21 want to take a moment, Dr. Kunkel --

22 THE WITNESS: Yeah, please.

23 HEARING OFFICER HALLORAN: -- and
24 review these?

1 MR. RUSS: I have an objection while
2 Dr. Kunkel is reviewing these. There is a
3 photograph on the demonstrative on the screen that
4 implies that the core sample is taken from Joliet
5 and I don't believe that it is. It hasn't been
6 established that it was.

7 MS. NIJMAN: It's not the
8 implication. It's simply showing what poz-o-pac
9 looks like.

10 MR. RUSS: I just think the exhibit
11 clearly implies that that's related to that site
12 and I don't think it is.

13 MS. NIJMAN: I won't --

14 HEARING OFFICER HALLORAN: Excuse
15 me. On your redirect, you can qualify, clarify,
16 make clearer your point. Thank you.

17 BY MS. NIJMAN:

18 Q. Have you had a chance to look at the
19 Joliet drawings?

20 A. Yes.

21 Q. Okay. So if you look at the second
22 slide -- look at the second slide. So you see in
23 the cross section this is for Joliet ponds one and
24 two, do you see there is 12 inches of poz-o-pac?

1 A. Yes.

2 Q. There is a bottom geotextile
3 cushion?

4 A. Yes.

5 Q. Then there is an HPD liner of 60 mil
6 thick, correct?

7 A. Yes.

8 Q. And then there is another top
9 cushion of geotextile cushion, correct?

10 A. Yes.

11 Q. Then there is 12 inches of sand,
12 correct?

13 A. Yes.

14 Q. And then there is a warning layer of
15 six inches of crushed limestone, correct?

16 A. Yes.

17 Q. And to your understanding, is that
18 your -- is that your understanding of how these
19 ponds were relined?

20 A. Yes.

21 Q. Now, you see at the bottom there is
22 a line for the average groundwater and obviously
23 the average groundwater elevation differed from
24 pond one to pond two and I will also inform you to

1 make sure that the record is clear that the
2 elevations if you take them all the way out to
3 2017 as you did this morning varied slightly.

4 So I will posit to you and we'll
5 use it going forward as a hypothetical, I'll posit
6 to you that the average groundwater elevation from
7 2010 through 2017 for pond one is 505.77, which is
8 actually lower than what is stated here and for
9 pond two 505.05 -- 65. It is 505.65. My
10 correction. So slightly higher, but not
11 substantially different. So in looking at this
12 drawing, the average groundwater elevation is well
13 below the pond liner, correct?

14 A. I don't know because I don't know
15 what the elevation of the pond liner is.

16 Q. Well, you testified to that this
17 morning?

18 A. Can you refresh my memory of what it
19 is, the pond liner?

20 Q. I can.

21 MR. RUSS: I have to object again.
22 We weren't talking about Joliet 29 this morning.

23 HEARING OFFICER HALLORAN: Ms.
24 Nijman?

1 MS. NIJMAN: Then that's my mistake.
2 Then it was yesterday. Thank you.

3 BY MS. NIJMAN:

4 Q. So from yesterday, thank you,
5 Mr. Russ, the bottom elevation of pond one is 516
6 feet?

7 A. I don't remember that I ever
8 testified to any of those numbers. They may have
9 been in my report, but I don't remember testifying
10 to any of those numbers.

11 Q. Okay. Do you disagree that the
12 bottom elevation is at 516 feet?

13 A. No.

14 Q. Okay. So given that the bottom
15 elevation is at 516 feet and the average
16 groundwater elevation is about 506 feet, it's well
17 below, correct, at Joliet?

18 A. The average is well below, yes.

19 Q. Yes. And that's an average from
20 2010 through 2017, correct?

21 A. I have never had those data for --
22 for the Joliet -- oh, this is the groundwater, not
23 the --

24 Q. The groundwater data, yes.

1 A. The trouble with the groundwater
2 data, Mr. Hearing Officer, is that they were taken
3 quarterly. So there are a lot of days in in
4 between those quarterly samples when the river
5 could have risen, the groundwater could have
6 risen, but we have no data for those time periods.

7 Q. So even though we have been sampling
8 for elevations for over seven years, you're
9 suggesting something could have happened between
10 all those samples?

11 A. I am.

12 Q. Now, let's go to the drawing for the
13 Powerton -- the other Powerton basins that you
14 didn't talk about yesterday or this morning, I
15 don't remember which, so the fourth -- fifth
16 slide -- so this is the ash bypass basin, metal
17 cleaning basin and ash surge basin, which are all
18 constructed similarly.

19 Do you have that in front of
20 you?

21 A. Yes, I do.

22 Q. And those ponds basins all have
23 poz-o-pac on the bottom, correct?

24 A. Correct.

1 Q. And they all have sand and a warning
2 layer on top of the liner, correct?

3 A. Correct.

4 Q. And there is a geotextile cushion
5 below the HDPE and a top geotextile cushion above
6 the HDPE, correct?

7 A. Correct.

8 Q. So I'm looking up the bottom
9 elevations for you. The ash bypass basin bottom
10 elevation is 452 feet.

11 MR. RUSS: Objection. That's not
12 shown on this diagram. I'm not sure where those
13 numbers are coming from.

14 HEARING OFFICER HALLORAN: Ms.
15 Nijman?

16 MS. NIJMAN: At this -- I'm
17 obtaining those numbers because the witness
18 testified that he didn't remember the numbers that
19 he testified to this morning for Joliet. So I was
20 trying to help him.

21 MR. RUSS: I understand, but I don't
22 know where you're getting your numbers.

23 BY MS. NIJMAN:

24 Q. Okay. I'm going to ask you to

1 assume for the purpose of this question that the
2 bottom elevation of the ash surge basin is 452
3 feet. Okay?

4 A. Yes.

5 Q. And I'm going to ask you to also
6 look at the average groundwater elevations on this
7 drawing.

8 MR. RUSS: I also want to object to
9 the drawing because it doesn't provide any frame
10 of reference to the groundwater elevations and the
11 pond bottom elevations. Although there is a
12 visual implication of a distance between them this
13 doesn't state the elevation of the pond.

14 HEARING OFFICER HALLORAN: Again,
15 you have redirect and you can flesh it out then,
16 Mr. Russ. Thank you.

17 BY MS. NIJMAN:

18 Q. You see the scale in feet on the
19 left-hand side on this drawing?

20 A. Horizontal scale, yes.

21 Q. So that gives you distance, correct?

22 A. Not vertical distance, just
23 horizontal distance.

24 Q. Understood. And look to the right,

1 do you see four -- two blue lines on the right
2 side of the drawing?

3 A. I do.

4 Q. And those are indicating the
5 groundwater elevations?

6 A. Yes, I see that.

7 Q. So the pond bottom at 452 feet is
8 well above the groundwater average elevation,
9 correct, at the ash bypass basin, metal cleaning
10 basin and ash surge basin --

11 HEARING OFFICER HALLORAN: You have
12 to speak up, Ms. Nijman.

13 THE COURT REPORTER: Ash bi- --

14 MS. NIJMAN: Ash bypass basin, metal
15 cleaning basin and ash surge basin.

16 MR. RUSS: Before you answer, I
17 object. Compound. Vague.

18 HEARING OFFICER HALLORAN: If he can
19 answer and is able, you may proceed.

20 BY THE WITNESS:

21 A. I guess my problem, Mr. Hearing
22 Officer, is I'm not sure what average groundwater
23 elevation has to do with the bottom of the ponds.
24 I certainly as an engineer wouldn't be interested

1 in the average.

2 BY MS. NIJMAN:

3 Q. Well, you, in fact, looked at -- you
4 testified this morning as to the elevation of the
5 groundwater, correct?

6 A. Not this morning. Yesterday.

7 Q. Okay.

8 A. And I'm not sure we talked about
9 specific numbers.

10 Q. Well, you looked at charts and you
11 summarized what the elevation data was and you
12 gave highs and lows and said it's somewhere in
13 there. So we took that average.

14 MR. RUSS: Object. Misstates.

15 BY THE WITNESS:

16 A. I'm not sure I understand what the
17 average really represents. If you're trying to
18 say that average -- that the distance between the
19 average water -- groundwater surface elevation and
20 the bottom of the ponds --

21 BY MS. NIJMAN:

22 Q. Yes.

23 A. -- meets the EPA coal regs, that's
24 not what the coal regs say in my opinion.

1 Q. I didn't ask you that.

2 A. I understand that.

3 Q. I'm -- I understand you -- I not
4 asking you to compare this information to the CCR
5 requirements. I am asking you to look at whether
6 the average groundwater elevation based on this
7 drawing is below the bottom of the pond at 452
8 feet?

9 A. It is, but what I showed in my
10 report is that the groundwater elevations could be
11 a lot higher at times between when those quarterly
12 groundwater data were taken and that's my whole
13 issue is that the groundwater could go up and down
14 drastically in response to the Illinois River. So
15 this average is an average of quarterly data which
16 may not be representative of a true average of the
17 groundwater at the site. That's my big issue.

18 Q. Okay. So, again, even though there
19 is elevation data for over seven years on a
20 quarterly basis, you're afraid that somewhere in
21 between something else might have happened?

22 A. And it should have happened based on
23 the Illinois River data that I have, its
24 elevation.

1 Q. Let me go back to Joliet for a
2 second on that point.

3 Isn't it true that right near
4 the Joliet station on the Des Plaines -- Des
5 Plaines River is a lock system?

6 A. Yes.

7 Q. And the lock system is controlled by
8 the Corps of Engineers?

9 A. Yes.

10 Q. And, in fact, that greatly controls
11 the elevation of the Des Plaines River, correct?

12 A. Not necessarily greatly. When there
13 are very high flows.

14 Q. You have no evidence that there has
15 been a higher flow of -- or a higher elevation at
16 the Des Plaines River at the Joliet site, correct?

17 A. Higher than --

18 Q. Higher than what was listed in the
19 elevations of average groundwater elevations.

20 A. I do indirectly. I don't have water
21 level measurements, but I have discharge
22 measurements at the USGS gauging station.

23 Q. No. You told me you had no USGS --

24 A. No, I said --

1 Q. -- information for Joliet.

2 A. -- I didn't have any USGS river
3 stage data, but I do have flow data and when the
4 flow goes from a few thousand CFS to 10,000 CFS I
5 would assume the water level in the stream rises
6 as well in order to pass that flow.

7 Q. And where is this flow data?

8 A. This is upstream above the lock.

9 Q. Above the lock?

10 A. Upstream from the lock. So the
11 indirect evidence is that when the -- when the
12 discharges in the river go up, at that point they
13 also go up downstream. The Corps doesn't let the
14 water just -- try to store all that water. It
15 would be impossible to store it behind the lock.

16 Q. This is -- okay. I'm trying to
17 understand your opinions because --

18 A. Yeah.

19 Q. -- I'm trying to understand how you
20 know what -- without data, what those levels are,
21 what those river levels are?

22 A. I don't know exactly what the river
23 levels are, but in my report I alluded to the fact
24 that there is a gauging station upstream and that

1 I was going to use and I did use in my report
2 stream flow as a proxy for water level.

3 In other words, if the stream
4 flow increased, the water level had to increase.
5 I don't know by how much, but it had to. This is
6 simple conservation of mass in the Des Plaines
7 River.

8 Q. So you're making an assumption as to
9 the levels -- the height levels, the elevations of
10 the Des Plaines Rivers?

11 A. No, I'm not making an assumption of
12 the high levels. All I'm making -- all I'm saying
13 is that if the flow discharge increases, the water
14 level elevation has to increase. And I don't know
15 by how much because I don't have a rating curve at
16 that point. All I know it has to go up, it has to
17 go higher. That coupled with the information
18 that -- that Rich Gnat gave where we had erosional
19 features along the bank of the Des Plaines River
20 said the water level in the Des Plaines got at
21 least that high and we have actual data points
22 along that --

23 Q. Okay. Can --

24 A. -- point.

1 MR. RUSS: Object. Interrupting the
2 witness.

3 BY MS. NIJMAN:

4 Q. I'd like to refocus because now
5 you're on a whole different topic. So --

6 MR. RUSS: My objection still
7 stands. He was completing his answer.

8 HEARING OFFICER HALLORAN:
9 Overruled.

10 BY MS. NIJMAN:

11 Q. So let me ask again because your --
12 your answer had a big if in it. You used the word
13 if. If this happens, if the river level goes up,
14 so you don't know, correct?

15 A. No, that's not correct. If the
16 discharge increases --

17 Q. If.

18 A. -- the water level has to go up.
19 When the discharge increases, the water level has
20 to go up. When the discharge increases.

21 Q. So you are basing your opinion at
22 Joliet as to the river levels on the USGS
23 discharge data?

24 A. I'm not -- I'm not saying that I

1 know what the river levels are. All I know is
2 that when the discharge increases in the stream --
3 in any stream, the water level goes up unless
4 there is, you know, within reason.

5 Q. All I'm trying to get -- clarify is
6 that you don't know, correct?

7 MR. RUSS: Objection. Asked and
8 answered.

9 HEARING OFFICER HALLORAN: I agree.
10 Sustained. I've heard it six times.

11 MS. NIJMAN: Okay. Good.

12 HEARING OFFICER HALLORAN: Thanks.

13 BY MS. NIJMAN:

14 Q. Now, as to Waukegan in your July
15 2015 report you initially opined that there was
16 likely hydrostatic uplift at Waukegan, correct?

17 A. That was based on erroneous bottom
18 elevations of the pond provided by Patrick.

19 Q. Okay. So your July '15 report was
20 wrong in that regard?

21 A. No, based on the data I had, there
22 would have been hydrostatic uplift, but I had
23 incorrect bottom -- pond bottom elevations.

24 Q. I understand. I'm just trying to

1 say --

2 A. It wasn't --

3 Q. Let me finish. The board is going
4 to look at your reports and is going to need to
5 understand that there are errors in it. So I
6 would like to just clarify that that, in fact, is
7 an error in your initial report that --

8 A. I don't consider it to be an error.
9 I consider it to be data given to me at the time
10 that was incorrect and I used it, you know, in an
11 engineering sense assuming that it was correct
12 because it was provided by Midwest and I wouldn't
13 think that Midwest would give me incorrect
14 information.

15 Q. Well, you have all the information
16 available to you and you relied on a certain
17 report for your opinion about Waukegan and you
18 determined that there was likely hydrostatic
19 uplift, but you have now corrected that opinion,
20 is that a fair statement?

21 A. Yes.

22 Q. Thank you. I have a couple of
23 follow-up questions on that Montana Colstrip case
24 we were talking about.

1 You also opined in that case
2 that there were liner tears from dredging,
3 correct?

4 A. I don't remember. These were fly
5 ash ponds that were never dredged that I was
6 looking at.

7 Q. Okay. Take a look at the deposition
8 from that Colstrip case. On page 34, if you
9 look -- are you there?

10 A. I don't have it. Thirty-three pages
11 is all I have.

12 Q. It's these pages --

13 A. I see. I'm sorry.

14 Q. -- the way it's copied.

15 A. Okay.

16 Q. So on page 34 lines starting at line
17 4 it says -- this is the attorney, the Talen
18 attorney asking you

19 Q. The next thing under this
20 bullet point you mentioned is liner damage during
21 ash dredging, what do you mean by that?

22 A. Well, typically the pond ash
23 bottoms in particular fill up and they are dredged
24 and then the bottom ash is disposed somewhere. It

1 isn't clear from the reports that I saw exactly
2 where, but I would assume that Talen does not
3 dredge hydraulically, that they actually bring
4 equipment into the pond, into the ash -- bottom
5 ash ponds and scoop out the ash. In my experience
6 on other projects, that leads to liner damage.

7 Do you see that?

8 A. I see that.

9 Q. So does that refresh your
10 recollection that --

11 A. It does, but I didn't look at any of
12 the bottom ash ponds. So this was a little aside,
13 I guess, with the attorney.

14 Q. Well, he was reading from your
15 report, the next thing under this bullet of your
16 report.

17 A. These were general comments in my
18 report that said that dredging can cause liner
19 tears.

20 Q. Okay. That's all I was asking.

21 A. It really had nothing to do with the
22 three ponds that I was looking at, which were the
23 fly ash ponds. I mean, specifically. It was a
24 general --

1 Q. All I asked was your opinion in that
2 case was that dredging causes --

3 A. Yes.

4 Q. -- liner damage?

5 A. Yes, it does.

6 Q. Now, you recall it.

7 A. Yes, I do.

8 Q. Okay. And you said that was based
9 on your assumption, you used the word assumption
10 here "I assume that"?

11 A. But that's because it's standard
12 practice.

13 Q. Okay. So let me -- let me continue
14 reading from this deposition a little bit. If you
15 look -- I'm going to start at the bottom of page
16 34, line 23.

17 Q. Did you review any documents
18 that discuss ash dredging at those two ponds?

19 A. No.

20 Q. Did you review any documents
21 that talk about dredging in any of the ponds?

22 A. No.

23 Q. If dredging does occur, is
24 it fair to say you likewise didn't review any

1 documents that talked about how Talen goes about
2 that dredging?

3 A. That's correct.

4 Q. Or about how Montana Power
5 or PPL before Talen went about that dredging if it
6 occurred?

7 A. That's correct.

8 Q. You don't know whether
9 equipment was ever on these locations?

10 A. No.

11 Q. That's an assumption --

12 A. Not for sure, yeah.

13 Q. That's an assumption you're
14 making?

15 A. That's an assumption on my
16 part.

17 So you are just assuming that
18 dredging causes damage in the Talen case?

19 A. I think that it's well-known in the
20 industry that dredging has a high potential -- if
21 it's mechanical dredging with heavy equipment,
22 that has a potential for causing liner tears.

23 Q. So that's an assumption you make in
24 your opinions?

1 A. That would be the conservative
2 assumption to make, yes.

3 Q. Look at this deposition one more
4 time on page 38 on line three.

5 Q. And that's a fundamental
6 basis for your opinions, isn't it, that you are
7 assuming these things happen all the time and just
8 weren't documented?

9 A. Possibly, yes. Uh-huh.
10 Do you see that?

11 A. Yes.

12 Q. And so that's what you're saying
13 here as well --

14 A. Yes.

15 Q. -- that you're assuming these things
16 happened?

17 A. Yes.

18 Q. Now, you've made an assumption in
19 this case, the Midwest Gen case, that heavy
20 equipment was used in the Midwest Gen ponds,
21 correct?

22 A. Yes.

23 Q. And you recall that Lafarge is the
24 contractor who performs that ash removal?

1 A. At least some -- some of the ponds,
2 yes.

3 Q. Now, you have no basis to assume
4 that Lafarge used poor practices, do you?

5 HEARING OFFICER HALLORAN: Can you
6 speak up, please?

7 MS. NIJMAN: I'm sorry. I'm turned
8 this way.

9 BY MS. NIJMAN:

10 Q. You have no basis to assume that
11 Lafarge uses poor practices in dredging, do you?

12 A. Only based on the testimony by -- by
13 Rebecca Maddox.

14 Q. What was that?

15 A. Well, she sat in this chair and said
16 that she thought that the dredging caused liner
17 tears that she witnessed. I believe that's
18 correct.

19 Q. Do you mean the liner -- the single
20 liner tear --

21 A. Yes.

22 Q. -- correct? The one that was up at
23 the top of the ramp, that liner tear?

24 A. Yes.

1 Q. So that's your basis to assume that
2 Lafarge is using poor practices?

3 A. You know, I don't know whether it's
4 poor practices, careless operator error, things
5 like that. But I think that any time you have
6 heavy equipment in a pond we wouldn't allow
7 equipment to go into our ponds to do anything.
8 It's just not good engineering process to have any
9 kind of equipment around plastic. It's just not
10 good practice in my opinion.

11 Q. So you're making an assumption in
12 this case that Lafarge is using poor practices?

13 MR. RUSS: Object. Misstates.

14 HEARING OFFICER HALLORAN: Could you
15 rephrase that?

16 BY MS. NIJMAN:

17 Q. Isn't it true that you have assumed,
18 in this case, that Lafarge is using poor dredging
19 practices?

20 MR. RUSS: Object. Asked and
21 answered.

22 HEARING OFFICER HALLORAN: He can
23 answer if he's able.

24

1 BY THE WITNESS:

2 A. My experience with contractors is
3 they all make mistakes.

4 BY MS. NIJMAN:

5 Q. Okay.

6 A. Whether that's poor practice or just
7 a mistake, the operator has a bad day, but it
8 happens.

9 Q. I appreciate that answer. I want to
10 show you when you were deposed, when I deposed
11 you, I want to remind you what you said to me then

12 A. You know, I think if one
13 reads through the documents that were provided
14 that removal -- or the dredging of the ash with a
15 backhoe is very dangerous and if the equipment is
16 running around on the bottom of the ponds, that's
17 not an acceptable way to dredge ash.

18 Q. Right. And I'm asking
19 what's the basis for saying that that happened at
20 Powerton?

21 A. I assume that your two
22 contractors either -- that serve all four power
23 plants -- I mean, two -- one serves two and the
24 other serves two.

1 Q. So you're assuming that
2 that's what Lafarge --

3 A. Yes.

4 Q. -- did, that Lafarge uses
5 poor --

6 A. Yes.

7 Q. -- practices?

8 A. Yes.

9 MR. RUSS: Objection. Improper
10 impeachment. Different question, different site.

11 HEARING OFFICER HALLORAN: What site
12 are we on now? That was Powerton, I think, or was
13 that the four sites?

14 MS. NIJMAN: The reference he made
15 was to use of Lafarge and all -- or its other
16 contractor in all four sites and that's why I
17 raised it.

18 HEARING OFFICER HALLORAN: You know,
19 again, that's why we have redirect in this and you
20 can flesh that out and make clear in the record
21 your objection. Overruled.

22 BY MS. NIJMAN:

23 Q. I want to clarify something about
24 the reports that you've issued in this case.

1 You've identified this morning and yesterday three
2 different reports, correct?

3 A. Yes.

4 Q. Now, since your deposition in March
5 of 2016, you were provided with some additional
6 groundwater data, some monitoring data, taking us
7 through second quarter of 2017, correct?

8 A. Yes.

9 Q. And you used that additional
10 monitoring data to update the opinions that you've
11 been given today and yesterday?

12 A. My testimony, yes.

13 Q. Mm-hmm. And you provided your
14 testimony with knowledge of that additional data,
15 correct?

16 A. Yes.

17 Q. But other than the additional
18 groundwater data, your opinions are set out in the
19 series of reports you issued, correct?

20 A. Correct.

21 Q. And in your deposition of March of
22 2016, you told me that the reports contained your
23 opinions for the case?

24 A. Yes.

1 Q. And your reports rely on several US
2 EPA documents, right?

3 A. Yes.

4 Q. Including the US EPA CCR rules?

5 A. Yes.

6 Q. Now, the reason I'm confused about
7 your reports is I actually have a lot of other
8 reports from you. So let's do this
9 chronologically.

10 You identified the report, your
11 first report, and that's Exhibit 401, that's dated
12 July of 2015, correct?

13 MR. RUSS: Objection. Misstates
14 testimony.

15 HEARING OFFICER HALLORAN: I'm
16 sorry. Ms. Russ -- Mr. Russ. Sorry.

17 MR. RUSS: That's okay.

18 BY MS. NIJMAN:

19 Q. I'm sorry. I shouldn't have called
20 it your first report. You did an initial report
21 that's not part of this case. Your first report
22 for the Midwest Gen facilities that is part of
23 this case is Exhibit 401, correct?

24 A. Correct.

1 Q. Okay. Then you prepared a rebuttal
2 report that you identified as Exhibit 407 in this
3 case, right, and that's in your binder?

4 A. Mm-hmm, yes.

5 Q. Then you also submitted a
6 supplemental rebuttal report dated March of 2016,
7 do you recall that?

8 A. Yes.

9 Q. You didn't identify that in your
10 direct testimony, why is that?

11 A. I wasn't asked about it.

12 Q. Okay. And do you recall why you
13 submitted this supplemental report to me? Let me
14 say it this way.

15 Specifically, the supplemental
16 report refers to a couple of citations to support
17 your opinions, is that right?

18 A. Citations? I'm not sure.
19 References in the report?

20 Q. Yes.

21 A. There's a page and a half of
22 references. I'm not sure.

23 Q. I'm sorry. If you look at the
24 things that are red lined in this document, and

1 this is the way that it was provided to me, you'll
2 see that there are a number of little red line
3 additions that added some references to support
4 your opinions, do you see that?

5 A. No.

6 Q. Okay. Look at page eight.

7 A. Yes.

8 Q. Do you see that the added -- there
9 are some Bates numbers added, do you see that?

10 A. Yes.

11 Q. So those are additional supports for
12 your opinion?

13 A. Yes.

14 Q. On page nine, you added some
15 additional citations for your opinions?

16 A. Bates numbers, yes.

17 Q. Other than those changes, does this
18 appear to be the same as your December 8th, 2015,
19 report?

20 A. It does, yes.

21 Q. Now, I also received an e-mail
22 dated -- so on the same date as this supplemental
23 report of March 9th you sent an e-mail to your
24 counsel, this is Comp 51722 Bates number, do you

1 recognize that e-mail?

2 A. Yes.

3 Q. So you say there "Attached Bates
4 49254. Did not show uneven subgrade and was
5 eliminated from the supplemental report," correct?

6 A. Correct.

7 Q. So you took that citation out of the
8 supplemental report?

9 A. Apparently, yes.

10 Q. Okay. So then you identified
11 another rebuttal report that you talked about
12 already in Exhibit 408 in your binder, right?

13 A. Yes.

14 Q. Okay. And then we had the
15 deposition based on those various reports. Now,
16 do you recall in the deposition on March 17th,
17 2016, that we went through a lot of the citations
18 in your July '15 report that were the basis of
19 your opinions, we talked through a whole bunch of
20 them, do you remember that?

21 A. Yes.

22 Q. And we kept finding that the
23 documents you cited in your July '15 report did
24 not support your statements and opinions, do you

1 recall that?

2 A. Yes.

3 Q. And, in fact, you cited to
4 photographs that you said supported your
5 statements and then we looked at the photographs
6 and it had nothing to do with your statement,
7 correct?

8 A. I don't remember. I think that's
9 correct, yes.

10 Q. And you cited to documents and when
11 we went to those documents, they didn't support
12 your opinions, correct?

13 A. Not quite true. Those were
14 documents that -- the original document had a set
15 of Bates numbers and I didn't have the appendices
16 so I asked for a new document and that document
17 had different Bates numbers and so those Bates
18 numbers from the original document that didn't
19 have the appendices was left in the report. Well,
20 actually, yes, the citation in the report is
21 correct. It's just the Bates numbers in my
22 citations at the end of my July 1st, 2015,
23 report -- the Bates numbers are incorrect. The
24 document is correct and I can cite an example if

1 you like.

2 Q. Well, no. I'm not quite sure what
3 any of that means what you just said. I got a
4 little confused. I asked the question you cited
5 to documents in your report and when we went to
6 those documents they didn't support your opinions,
7 correct?

8 A. No, the documents do support my
9 opinions and if you're specifically referring to
10 the ENSR documents, it was the Bates numbers that
11 you utilized for the report. I used the title of
12 the document and the full document which had all
13 the appendices. Those Bates numbers were added
14 later and they were the incorrect Bates numbers.
15 So you're correct in that respect.

16 Q. Okay. I am correct?

17 A. Yes.

18 Q. Okay.

19 A. The Bates numbers were incorrect,
20 but the document was correct that I used.

21 Q. Okay. I'm still not getting an
22 answer. You're talking about one specific
23 situation?

24 A. But that was the majority of the

1 problems that you had with my report, with the
2 Bates numbers in my report is that the Bates
3 numbers that were at the end of the references in
4 my report were the incorrect Bates numbers.

5 Q. It wasn't just the end of the
6 references, though, it was throughout your report,
7 correct?

8 A. Those were very minor, a couple of
9 photographs that they were incorrect Bates numbers
10 and I apologize for that.

11 Q. Well, the problem is in looking
12 at -- isn't it correct in looking at your July
13 2015 report and comparing it to the Bates numbers
14 that are listed there, we cannot state that any of
15 those Bates numbers support the opinion, is that
16 correct?

17 A. My opinion is my opinion.

18 Q. I'm asking about the support for
19 your opinions is not documented in your report,
20 correct --

21 MR. RUSS: I object.

22 BY MS. NIJMAN:

23 Q. -- not documented correctly in your
24 report?

1 HEARING OFFICER HALLORAN: There's
2 an objection.

3 MR. RUSS: It misstates. It's also
4 vague. It doesn't help -- we don't know which
5 citation you're talking about. You're making a
6 broad generalization about all of his references.

7 MS. NIJMAN: Well, the problem is --
8 if you recall this from the -- let me --

9 HEARING OFFICER HALLORAN:
10 Overruled.

11 MS. NIJMAN: Thank you.

12 BY MS. NIJMAN:

13 Q. During the deposition, you recall
14 that we walked through many different errors --

15 MR. RUSS: Object to the --

16 BY MS. NIJMAN:

17 Q. -- do you recall that?

18 A. I don't know that there were that
19 many.

20 HEARING OFFICER HALLORAN: Excuse
21 me. There is an objection out there. Mr. Russ?

22 MR. RUSS: Object to many. Vague.

23 HEARING OFFICER HALLORAN:
24 Overruled. Dr. Kunkel was answering.

1 BY THE WITNESS:

2 A. Yeah. I don't -- I don't think
3 there were many. I don't understand what many is.
4 There were several perhaps. They certainly don't
5 detract from my opinions in the report or the
6 accuracy of the report in my opinion.

7 BY MS. NIJMAN:

8 Q. But, again, our problem has been we
9 don't have support for any of your opinions.

10 MR. RUSS: Object. That's not a
11 question.

12 HEARING OFFICER HALLORAN:

13 Sustained.

14 BY MS. NIJMAN:

15 Q. Now, I think it's fair to say that
16 your July 2015 report does not contain accurate
17 citations to support for your opinions --

18 MR. RUSS: Object --

19 BY MS. NIJMAN:

20 Q. -- correct?

21 MR. RUSS: -- again.

22 HEARING OFFICER HALLORAN: Mr. Russ?

23 MR. RUSS: That misstates prior
24 testimony. She is making a generalization about

1 the whole report. That's clearly not what he was
2 testifying to.

3 HEARING OFFICER HALLORAN: Yeah,
4 it's a little vague and a generalization and I
5 think Dr. Kunkel answered the best he could.

6 BY MS. NIJMAN:

7 Q. Do you recall saying to me at the
8 deposition "I don't know what happened here. I
9 just don't make mistakes like this," do you recall
10 saying this to me? Because we had gone through a
11 lot of mistakes.

12 A. I remember saying that, yes, I do
13 clearly.

14 Q. Because you were getting frustrated
15 about the mistakes, correct?

16 A. They were not my mistakes. That's
17 why I was getting frustrated.

18 Q. Well, I don't know whose mistakes
19 they were, but we were both frustrated about the
20 number of mistakes, correct?

21 A. Correct. No one more than I.

22 Q. Yeah. Well, again, the problem
23 being it made it very difficult to understand your
24 opinions.

1 Now, after the opinion, you
2 provided me with corrections, right?

3 A. I believe so, yes.

4 Q. So, first, you sent me some of the
5 corrections to the citations in your reference
6 section, that's what you were just talking about
7 with the ENSR reports?

8 A. Exactly, yes.

9 Q. So let me show you that. So this is
10 an e-mail dated March 21st, 2016, Comp No. 53522
11 and you'll see that there is two e-mails. They're
12 both dated March 21st, 2016, they're both from you
13 to your counsel, they -- oh, shoot. Hold on. I
14 have given out -- I think you may have a different
15 Bates -- what's the Bates on the document you
16 have?

17 A. 53523 and 53525.

18 Q. And so that's my question to you, is
19 there appears to be two of the same document --

20 A. Yes.

21 Q. -- and yet they were e-mailed
22 separately, can you tell me are they the same?

23 A. They are the same.

24 Q. So 53525 and 53523 are identical?

1 A. As far as I can tell, yes.

2 Q. So this was the first effort after
3 the deposition of you correcting some of the
4 citations in your report, correct?

5 A. Correct.

6 Q. So then you were asked to follow-up
7 on some additional items I asked you for during
8 your deposition, right?

9 A. Yes.

10 Q. Showing you Comp 53528. This is an
11 e-mail from Lindsay Dubin, one of the attorneys
12 for the complainants, to you dated Monday, March
13 28th, 2016, titled Follow-Up Items From Jim Kunkel
14 Depo and there is a list of 14 different items
15 that I had asked you to follow-up from your
16 deposition, do you recall that?

17 A. Yes.

18 Q. And these are -- these are the
19 examples of information that was missing from your
20 July 2015 report, correct?

21 A. I don't know that it was missing.

22 Q. Well, let's look at them then.
23 Number one says contamination report page four.
24 Correct citation. So you had an incorrect

1 citation in your report and that needed to be
2 fixed? Number two. Contamination report page
3 nine, check the cited Bates range for correct
4 citation for HDPE being placed on poz-o-pac and
5 attached to concrete discharge. We can read
6 through all of these if you like, but they are
7 all -- based on your report, they were issues that
8 we had raised in your deposition that were
9 missing, correct or incorrect, or they were wrong?

10 A. No. You know, I don't -- I don't
11 necessarily agree with that generalization. The
12 citations to me are my references in the back of
13 the report and except for what you gave me here
14 on -- on Bates 53523 and 525 the real problem had
15 to do with Bates numbers, not with the citation --
16 the reference that I used. I don't use Bates
17 numbers, I use references and the Bates numbers
18 were added by another person and they got them
19 incorrect, but the references are correct and
20 they're the basis for my opinion.

21 Q. I understand, but you're -- again,
22 the question I'm asking you is we looked at your
23 2015 report together.

24 In that report, you would make a

1 sentence, like a sentence on number two,
2 contamination report page nine, you would then in
3 your report that you signed, it would then
4 reference a specific document as support for your
5 statement, correct?

6 A. Document, yes.

7 Q. Okay. And then when we would go to
8 look at that document it wasn't the document you
9 thought it was, correct?

10 A. No, that's not correct. It was the
11 document I thought it was. The problem was that
12 it had different Bates numbers than the document I
13 used, but it was still -- the title of the
14 document was still the same if I remember
15 correctly for the majority of these.

16 Q. But that was the problem with your
17 report, right, is that you didn't give titles to
18 documents, you just gave a number. So --

19 MR. RUSS: Object. Object.

20 HEARING OFFICER HALLORAN: Mr. Russ?

21 MR. RUSS: It misstates his
22 testimony and it mischaracterizes the report.
23 There may have been instances, but the implication
24 is that his whole report cites to Bates page

1 ranges and that's not the case.

2 HEARING OFFICER HALLORAN:

3 Sustained.

4 BY MS. NIJMAN:

5 Q. Let's look at your report Exhibit
6 401.

7 HEARING OFFICER HALLORAN: I'm
8 thinking about five minutes we'll take a lunch.

9 MS. NIJMAN: Okay.

10 BY MS. NIJMAN:

11 Q. I'm sorry. Page nine of your report
12 and I'm just reading from this e-mail that asks
13 you to follow-up on contamination report page
14 nine. Okay?

15 A. Yes.

16 Q. So in the middle of this paragraph
17 on coal ash management, you have the sentence
18 "When all three Joliet 29 ash ponds were relined
19 with HDPE, the plastic was placed on top of the
20 existing poz-o-pac liner after its partial
21 removal. Plastic was placed directly on the side
22 slope poz-o-pac and attached to the ash pond
23 concrete discharge structures" and you see then
24 there is a parenthesis and a Bates number of a

1 document, do you see that?

2 A. Yes.

3 Q. And when in the deposition we went
4 to that document, that had nothing to do with
5 poz-o-pac lining, correct?

6 A. You know, I don't know, but the
7 statement, the sentence, is correct as far as I
8 know. That's what I understood.

9 Q. Correct. And you referenced,
10 though, something -- I know it's what you
11 understood, but your support wasn't there. You
12 made an assumption about that, correct?

13 MR. RUSS: Object. That's not what
14 he said.

15 HEARING OFFICER HALLORAN: I can't
16 remember what he said. He may answer if he's
17 able.

18 THE WITNESS: I can't answer.

19 HEARING OFFICER HALLORAN: Okay.
20 Thank you, sir.

21 MS. NIJMAN: This might be a good
22 time to just break.

23 HEARING OFFICER HALLORAN: Okay.
24 Let's come back about 1:30. We're off the record.

1 Thank you.

2 (Whereupon, a break was taken
3 after which the following
4 proceedings were had.)

5 HEARING OFFICER HALLORAN: All
6 right. We're back on the record, back from lunch.
7 It's approximately 1:30. Dr. Kunkel is still up
8 on cross of Ms. Nijman.

9 MS. NIJMAN: Thank you.

10 BY MS. NIJMAN:

11 Q. Let me show you this is Citizens
12 Group's response to Midwest Gen's Third Request to
13 Produce Documents.

14 Dr. Kunkel, have you ever seen
15 this document before?

16 A. I'm not sure.

17 HEARING OFFICER HALLORAN: Do you
18 know what date this was filed? Nevermind,
19 Ms. Nijman. Sorry.

20 MS. NIJMAN: For the record, May
21 23rd, 2016.

22 HEARING OFFICER HALLORAN: Sorry.

23 MS. NIJMAN: No problem.

24

1 BY MS. NIJMAN:

2 Q. Well, in -- before lunch, we had
3 shown you a document asking for certain types of
4 information to back up your July 2015 report and
5 your rebuttal report and this document was
6 provided to us in partial response, do you recall
7 assisting your attorneys in preparing -- or the
8 attorneys for the complainants in preparing
9 responses to the requests that we saw in the
10 e-mail right before lunch?

11 A. Yes.

12 Q. If you would turn to page six of
13 this document.

14 In the request number two, your
15 report had included a table of leachate
16 concentrations, that was table two from your
17 report identified, and you relied on that report
18 for your opinion of the constituents on coal ash,
19 do you recall that?

20 A. Yes, I do.

21 Q. Okay. And you had a citation to a
22 Kosson, K-O-S-S-O-N, 2009, do you recall that?

23 A. Yes.

24 Q. And when we looked at the Kosson

1 report in your deposition, we saw it didn't
2 actually have the information that you said?

3 A. Yes.

4 Q. So in this exhibit, this response to
5 number two, you're providing me with the correct
6 document, correct, or your counsel is providing me
7 or the complainants?

8 A. The spreadsheets, is that what
9 you're talking about? Yes.

10 Q. Okay. I'm looking at request number
11 three. You had stated in your report that the
12 surrounding land use of the Waukegan station was
13 undeveloped land to the north and we discussed in
14 our -- in the deposition that was not accurate and
15 I asked you what document you would rely upon so
16 you now provided a document you relied upon,
17 correct?

18 A. Correct.

19 Q. Now, it's true to the north of the
20 Waukegan station for Midwest Gen is the Johns
21 Manville plant and super fund site, correct?

22 A. Yes, I believe so.

23 Q. As to request number four in your
24 rebuttal report of December 8th, 2015, you had

1 stated that Mr. Seymour claims that groundwater
2 contamination is from up gradient, offsite sources
3 entering the site and you gave me a citation to
4 Mr. Seymour's report and when we looked at
5 Mr. Seymour's report we couldn't find that and so
6 you provided me with this response to number four,
7 correct?

8 A. Yes.

9 Q. And if we look at the first bullet
10 in the response, it says -- this is where you're
11 quoting from Mr. Seymour's report. You say --
12 you're quoting the statement "Thus, it is my
13 opinion that the recent groundwater impacts are
14 not a result of the ash currently stored in the
15 ponds at the site, but instead are more likely
16 than not a result of historic uses at the sites
17 and the surrounding industrial companies and
18 conditions."

19 So Mr. Seymour never stated, in
20 fact, that all constituents were coming from
21 offsite, did he?

22 MR. RUSS: Object. That's not what
23 the request states either.

24 HEARING OFFICER HALLORAN: Okay. On

1 redirect, you can bring that up. Just take a
2 note. You may answer if you're able.

3 BY THE WITNESS:

4 A. I'm not sure what the intent of John
5 Seymour's bullet one quote is whether he meant to
6 imply that nothing was coming on from up gradient.
7 It doesn't -- it doesn't strike me that way.

8 BY MS. NIJMAN:

9 Q. Right. Because he says historical
10 uses at the sites, right?

11 A. And surrounding industrial companies
12 and conditions. Whatever that means. I'm not
13 sure what that means.

14 Q. Okay. So it doesn't really -- that
15 doesn't support your statement of -- of --

16 A. It might. It might.

17 Q. Okay. Again, I'm just looking for
18 the support for the statement in your report and
19 this is what was provided to me.

20 A. I don't think I quoted John Seymour.
21 I think that my interpretation of what he was
22 saying is that contaminants were coming from
23 off -- offsite.

24 Q. Right. And when I asked you the

1 basis for that interpretation --

2 A. This is it.

3 Q. This is it. Okay.

4 A. Yes.

5 Q. So after all this, I then received
6 another correction to your reports. Do you
7 recognize this document?

8 A. No.

9 Q. Well, you signed it, Mr. Kunkel.
10 MR. RUSS: Objection. I don't see a
11 signature.

12 THE WITNESS: At the end.

13 MR. RUSS: I'm sorry.

14 BY MS. NIJMAN:

15 Q. It's a sworn certification signed by
16 James R. Kunkel, is that you?

17 A. Yes, I remember seeing this document
18 and signing it, yes.

19 Q. And do you see the attachment?

20 A. Yes.

21 Q. These appear to be the answers to
22 all the follow-up questions I had from the
23 deposition requesting support for your opinions --

24 A. Okay.

1 Q. -- is that correct?

2 A. Yes.

3 Q. So as I tried to understand and go
4 through all this in order to determine if a
5 statement made in your reports is supported, I
6 have to look at all the various documents that
7 we've just gone through this morning, correct?

8 A. Yes.

9 Q. And we would also have to review
10 your deposition because of the number of things we
11 went through in the deposition as to citations,
12 correct?

13 A. Yes.

14 Q. So looking at this sworn
15 certification in your response to number two, I
16 asked you for support for your assertion that,
17 quote, plastic was placed directly on the side
18 slope poz-o-pac and attached to the ash pond
19 concrete discharge structures, do you recall
20 saying that in -- in your report?

21 A. Yes.

22 Q. Okay. And so you provided me here
23 with a document to support that statement,
24 correct?

1 A. I'm not sure what document you're
2 referring to.

3 Q. Well, it says it will -- it has a
4 Bates on number two. There is now a document
5 giving me an answer as to what the basis was for
6 your statement.

7 A. 28034?

8 Q. Correct. Midwest Gen 28034.

9 A. Okay. I guess I apologize. Your
10 reference to citation is much different than mine
11 in the scientific sense.

12 Q. I understand.

13 A. And I get confused for sure.

14 Q. Now, you -- let's look at your
15 report, your July 2015 report, if we look at page
16 nine of the report.

17 HEARING OFFICER HALLORAN: I should
18 know this by heart, but what report?

19 MS. GALE: 401.

20 MS. NIJMAN: 401.

21 HEARING OFFICER HALLORAN: Thank
22 you.

23 BY MS. NIJMAN:

24 Q. In the middle of the paragraph, coal

1 ash management.

2 A. Yes.

3 Q. There is a sentence that starts
4 "When all three Joliet 29 ash ponds were relined
5 with HDPE, the plastic was placed on top of the
6 existing poz-o-pac liner after its partial
7 removal" and then it goes on "Plastic was placed
8 directly on the side slope poz-o-pac and attached
9 to the ash pond concrete discharge structures" and
10 then you and I talked about this earlier this
11 morning, right?

12 A. Yes.

13 Q. Now, in your sworn certification,
14 the response to the support for this statement was
15 now document 28034. So looking at 28034 I believe
16 this is actually an exhibit in the case now, but I
17 could not connect it up.

18 So if you look at Bates 28034,
19 that's the back page.

20 A. Yes.

21 Q. Now, you were here when Mr. Lux was
22 testifying, correct?

23 A. Yes.

24 Q. And you heard Mr. Lux talk about

1 this photo and tell you this is geotextile,
2 correct?

3 A. That was his opinion, yes. He was
4 there.

5 Q. So this doesn't show plastic on the
6 poz-o-pac, does it?

7 A. But that's a fine, fine point
8 because the plastic goes right over the top of the
9 geotextile. Come on. That's not a -- it's close
10 enough.

11 Q. Well, your statement in your report
12 is plastic was placed directly on the poz-o-pac
13 using the word directly which concerned you
14 because of potential harm to the liner. So I ask
15 you again this is not plastic on the poz-o-pac, is
16 it?

17 A. And I don't know that by looking at
18 the photo except that Christopher Lux testified to
19 it, but this is what I'll say. I was led to
20 understand from the documents I reviewed and from
21 the drawings that plastic went on the poz-o-pac,
22 the fact that there is a geotextile under it and
23 the poz-o-pac is rough does not take
24 responsibility away from the engineer to make sure

1 that that poz-o-pac is not poking through into the
2 liner.

3 Q. And you have no documents to support
4 your statement that the poz-o-pac was rough?

5 A. I have 50 years of engineering
6 experience with liners.

7 Q. Sir, that's not what I asked you.
8 You have no documents to support that the
9 poz-o-pac was rough, do you?

10 A. Only photographs.

11 Q. Okay. And we'll get to that. You
12 have no -- isn't it true that the poz-o-pac was
13 certified smooth by the installers of the liners?

14 A. I don't understand smooth.

15 Q. Okay.

16 A. To amend that, I don't see smooth in
17 this photograph.

18 Q. I'm not asking about the photograph.
19 I'm asking about you are aware that when the
20 liners at Joliet were installed, there were
21 professional, third-party consultants who
22 certified -- a professional engineer in the State
23 of Illinois who certified that the poz-o-pac was
24 smooth and acceptable for the liner, are you aware

1 of that?

2 A. No, I'm not aware of that.

3 Q. So showing you a packet of
4 documents.

5 HEARING OFFICER HALLORAN: I'm
6 sorry. Showing --

7 MS. NIJMAN: A packet of documents
8 entitled construction documentation transmittal
9 ash impoundment one and two liner replacement.

10 HEARING OFFICER HALLORAN: Thank
11 you.

12 BY MS. NIJMAN:

13 Q. This is Exhibit 1 -- this is -- I
14 see, the prior one. So the Bates numbers on this
15 document are 49362, Midwest Gen 49362 to --

16 HEARING OFFICER HALLORAN: Is this
17 an exhibit already, Ms. Nijman?

18 MS. GALE: No.

19 MS. NIJMAN: Not yet. I don't
20 believe so.

21 HEARING OFFICER HALLORAN: I don't
22 have a copy, but I'll just wing it for now if you
23 don't have an extra one.

24 MS. NIJMAN: I don't right now, but

1 I will give this to you in just one moment.

2 HEARING OFFICER HALLORAN: Thank
3 you.

4 BY MS. NIJMAN:

5 Q. If you would turn to page 49459.
6 Have you seen this construction packet before?

7 A. No.

8 Q. No one has provided it to you before
9 for your review?

10 A. Not that I'm aware of.

11 Q. So you've made opinions about these
12 ponds at Joliet without ever having seen the
13 construction affirmation documents?

14 A. That's pretty much correct because
15 what I utilized was something different, the
16 drawings in the back which don't exactly show the
17 same thing as what these show.

18 Q. I'm a little dumbfounded that some
19 materials like this were not part of your review.
20 Did you turn to the page that I --

21 A. Yes.

22 Q. -- referenced you?

23 A. Yes.

24 Q. And that is the certification,

1 correct, showing that the liners -- or the
2 poz-o-pac was acceptable for the HDPE liner
3 installation?

4 A. It's a -- it's a visually inspected
5 subgrade surface that is certified for
6 installation of geosynthetic materials.

7 Q. And, Dr. Kunkel, you --

8 A. I'm not sure what that means.

9 Q. You're not sure what the
10 certification of the subgrade is?

11 A. Yes, that's correct. It doesn't say
12 anything about smooth. It doesn't say -- it just
13 says that it's certified that it's acceptable
14 for -- for installation of geosynthetic materials.
15 That's what it says and that's fine. I'll have to
16 trust the engineer who did it.

17 Q. Right. Because you weren't there?

18 A. I wasn't there, correct.

19 Q. And these are professional
20 installers, correct?

21 A. I assume so, yes. Mm-hmm.

22 MR. RUSS: I'm sorry. Can you
23 restate the page?

24 MS. NIJMAN: 49459.

1 MR. RUSS: Thank you.

2 MS. NIJMAN: Sure.

3 BY MS. NIJMAN:

4 Q. Now, you state in your reports that
5 you were concerned -- you said it just now. You
6 were concerned about the geotextile and that
7 the -- I'm sorry. This is from your supplemental
8 report in March of 2016.

9 MR. RUSS: Is that an exhibit?

10 MS. NIJMAN: Yes, it's your exhibit.

11 MR. RUSS: Do you remember -- 408, I
12 think.

13 MS. NIJMAN: Yes, supplemental
14 report is March 9th. It's the one I just provided
15 to you, the March 9th supplemental.

16 MR. RUSS: Oh, I'm sorry. That's
17 not one we did.

18 MS. NIJMAN: Correct. It's not an
19 exhibit.

20 MR. RUSS: Okay.

21 MS. NIJMAN: It's the additional
22 citations.

23 MR. RUSS: Right. Thanks.

24

1 BY MS. NIJMAN:

2 Q. Now, you state on page eight that
3 you're still concerned about the HDPE because the
4 geotextile might not be enough to protect the
5 HDPE, is that correct?

6 A. Yeah, if there are rocks or if there
7 is roughness from the poz-o-pac and if I remember
8 correctly some of the poz-o-pac was removed with a
9 jackhammer type instrument or equipment and that
10 leaves a fairly rough surface.

11 Q. But, again, that was certified
12 acceptable in some fashion so you don't really
13 know what --

14 A. I --

15 Q. -- if it was rough, do you?

16 A. I don't know that and I don't even
17 know that it was poz-o-pac. I think it just says
18 the surface. I didn't know whether -- I can't
19 tell from this whether it's a soil surface or
20 poz-o-pac or what it is.

21 Q. Well, we can walk through the field
22 notes of all those documents and you'll see
23 exactly what was done and the review of the
24 poz-o-pac, would you like to do that?

1 A. No, I don't think that's necessary.
2 You know, if you want to impune my opinions,
3 that's fine and I'm willing to accept that, but I
4 didn't see any construction documents. What I saw
5 were pre-construction drawings and the details on
6 those drawings didn't show exactly what the
7 subbase was. In fact, it didn't even show
8 poz-o-pac I think on some of the construction
9 drawings.

10 Q. Mm-hmm.

11 A. That was part of my problem. So I
12 was opining in my report --

13 Q. Based on the limited amount of
14 information?

15 A. Based on what I knew that that's
16 what happened or that's what I was instructed and
17 I apologize if -- if I didn't know that. I -- I
18 did the best I could with what I had.

19 Q. Thank you. If you turn to page 18
20 of the supplemental report -- excuse me. Eight of
21 14 of the supplemental report of March 9th. In
22 the second full paragraph, are you there, sir?

23 A. Yes.

24 Q. You discuss -- we're still talking

1 about this geotextile and you discuss an article
2 by Schroeder and others?

3 A. Yes.

4 Q. Now, that's also referred to as the
5 HELP, H-E-L-P, article, is that --

6 A. Hydrologic Evaluation of Landfill
7 Performance. It's called HELP, yes.

8 Q. And you use that as a basis for your
9 concern about the installation, but if I
10 understand you correctly now that you have the
11 construction documents you no longer hold this
12 opinion about the installation concern?

13 A. Well, only -- only because an
14 engineer is certified, but I'm still -- I'm still
15 not sure that the engineer was certifying soil or
16 poz-o-pac.

17 Q. Well, again, we can go through all
18 the field notes and you can see exactly what they
19 did because that's what their job is. Okay.

20 A. Okay. But if you can explain to me
21 what you're after here. If it's poz-o-pac, then
22 it's poz-o-pac. That's fine.

23 Q. Yeah. Right now I want to get at
24 this Schroeder article because you used the

1 Schroeder article to -- tell me if I am
2 misunderstanding it -- to support your claim that
3 liners leak, right?

4 A. That's one. All liners leak.
5 There's no doubt about that.

6 Q. And this is the article that
7 supports that statement, is that correct?

8 A. No. No. That all liners leak? No.
9 Schroeder is a -- that's a design manual for use
10 of the HELP model which is a very conservative EPA
11 model that I've used plus numerical models as
12 well, this is an analytical model, to assess the
13 amount of leachate that will go through a liner
14 placed in a landfill or a pond, coal ash pond.

15 Q. Right. And Schroeder wrote that
16 article in 1994, correct?

17 A. Yes.

18 Q. Now, Schroeder also didn't consider
19 leak detection test in his article or his
20 analysis, did he?

21 A. That's not the purpose of his
22 report.

23 Q. I understand. I'm just saying it's
24 not part of his analysis.

1 A. I don't know what you mean by his
2 analysis. His analysis had nothing to do with
3 leak detection systems or anything. His is a
4 design -- design guidelines.

5 Q. Well, let's try it this way. Isn't
6 it true that by conducting leak detection surveys
7 after installation, leaks would be detected before
8 the ponds are put in use, any leaks from the
9 installation process would be detected?

10 A. Yeah, only to the extent that that
11 represents a liner, which is unloaded, in other
12 words, it has no water in the pond or ash or
13 anything like that, that would be true, that you
14 would then attest the integrity of the seams,
15 defects in construction. That's what leak
16 detection does, yes.

17 Q. But the leak detection surveys take
18 place after the warning layer is placed, the sand
19 layer, I'm sorry, correct?

20 A. But that's a minimal amount of
21 impact on the liner and if nobody is out driving
22 around on it, which they shouldn't be, then you
23 would expect that the leak detection test which I
24 think in all the cases here show that the seams

1 were in pretty good shape, there were a few little
2 spots that were repaired and I agree with all
3 that.

4 Q. Okay.

5 A. The leak detection test should
6 always be done. There's no doubt about it. It
7 doesn't mean the liner won't leak tomorrow or the
8 next day or once water is in the pond or ash.

9 Q. But we have -- we don't know that?
10 I mean --

11 A. We pretty much know that from our
12 experience with -- with HDPE liners. They all
13 leak eventually.

14 Q. Eventually. Okay.

15 A. Yeah.

16 Q. So aren't they warranted for 50
17 years?

18 A. I have no idea. I don't believe
19 that any liner manufacturer warrants the placement
20 of the liner for 50 years. The material itself,
21 yes. HDPE, 50 years. The seams, that's a
22 construction issue.

23 Q. But you agree then that the leak
24 detection surveys are the most accurate way to

1 address any potential problems with the liner, the
2 line --

3 A. Immediately after construction.
4 Absolutely. Absolutely.

5 THE COURT REPORTER: I didn't get
6 the end of your question.

7 HEARING OFFICER HALLORAN: Yeah, we
8 have to slow down. Thanks.

9 BY MS. NIJMAN:

10 Q. A liner installation.

11 A. Immediately after construction leak
12 detection surveys should be done to assess the
13 integrity of the installation to make sure there
14 are no installation defects that are obvious.

15 Q. And as you said, that was done here?

16 A. Yes.

17 Q. Okay. Looking back at your
18 certification for a moment. So I asked you on
19 number seven to provide me with -- are you here?
20 Are you back on the certification?

21 A. This?

22 MR. RUSS: This one.

23 BY THE WITNESS:

24 A. I've got it.

1 BY MS. NIJMAN:

2 Q. So on number seven, I asked you to
3 provide me with the citation to a document
4 supporting the statement that, quote, written
5 documentation available from MWG on Will County
6 ash pond reconstruction, retirement and
7 maintenance in 2012 and 2013 indicates that the
8 ash ponds leaked until 2013 and likely continued
9 to leak due to poor liner construction and
10 maintenance, close quote, and that is from page 30
11 of your 2015 report, right? Do you remember I
12 asked you --

13 A. Yes.

14 Q. -- your support for that statement?

15 A. Yes.

16 Q. So this sworn certification from you
17 cites me to -- sends me a document. So I look at
18 the document, do you recognize this document
19 Midwest Gen Bates 48612?

20 A. Yes.

21 Q. And this is a memo actually that
22 Ms. Maddox talked about when she was here,
23 correct?

24 A. Yes.

1 Q. And this is dated 2008, correct?

2 A. Yes, September --

3 Q. And --

4 A. -- 3rd.

5 Q. -- it has nothing to do with 2012 or
6 2013, does it?

7 A. It predates 2012 and 2013, yes.

8 Q. And as you see from her questions
9 and you heard from her testimony, there is no
10 statement in this document that leaks occurred or
11 that there was poor ash pond construction,
12 retirement and maintenance as you state, correct?

13 A. I need to reread the document. The
14 answer to your question is correct.

15 Q. Thank you. Now, your initial report
16 of July '15 you also said that the Powerton site
17 was impacted by mercury as one of the constituents
18 of concern, do you recall that?

19 A. Yes.

20 Q. And we discussed in your deposition
21 that that was an error, correct?

22 A. Yeah, I took that from the notice of
23 violation or one of the documents that was
24 submitted to the state.

1 Q. And I see from the various tables
2 that you've provided, you no longer believe
3 mercury is an issue, correct?

4 A. I don't, no.

5 Q. Now, believe it or not there were
6 some things we did agree to during your
7 deposition.

8 A. Refresh my memory, please.

9 Q. All right. Here we go. You would
10 agree that the chemical composition of coal ash is
11 determined by the chemistry of the source coal and
12 the combustion process?

13 A. Yes.

14 Q. That's what you said at your
15 deposition?

16 A. Yes.

17 Q. And you would agree that the source
18 coal for the four Midwest Gen stations has
19 remained the same over its operation period?

20 A. It has with the exception that I did
21 hear testimony here that there may have been some
22 Illinois coal mixed in with the coal from one of
23 the plants and I can't remember which one and I
24 can't remember whether it was Chris Lux or --

1 anyway. Basically, you're burning --

2 Q. Same coal?

3 A. -- Powder River Basin coal from
4 Wyoming.

5 Q. And you agree that the combustion
6 processes have remained the same at the four
7 stations?

8 A. I don't know that for sure, but I
9 assume they have, yes.

10 Q. And you would agree that extensive
11 testing has shown that coal ash rarely, if ever,
12 exceeds hazardous waste criteria?

13 A. Yeah, based on the famous -- not
14 famous. Based on the ASTM test for hazardous
15 waste, that's true.

16 Q. And you would agree that when it's
17 available, you want to use data specific to your
18 own site?

19 A. Yes.

20 Q. And you would agree that -- and I
21 think you've said this to your -- to Mr. Russ.

22 In giving your opinions in this
23 case, you could not determine when groundwater
24 impact might have occurred at the stations?

1 MR. RUSS: Misstates. Objection.

2 BY THE WITNESS:

3 A. I don't understand the question.

4 HEARING OFFICER HALLORAN:

5 Overruled.

6 BY THE WITNESS:

7 A. I don't understand what you mean by
8 when.

9 BY MS. NIJMAN:

10 Q. Well, you've been asked several
11 times I think and I thought you made it quite
12 clear that you could not determine when impact to
13 groundwater occurred --

14 MR. RUSS: Object.

15 BY MS. NIJMAN:

16 Q. -- at the stations?

17 HEARING OFFICER HALLORAN: Yes,
18 Mr. Russ?

19 MR. RUSS: Completely misstates what
20 happened.

21 HEARING OFFICER HALLORAN: Well, you
22 know, I can't remember and, again, that's why we
23 have redirect. So if Dr. Kunkel can answer, go
24 ahead, sir.

1 BY MS. NIJMAN:

2 Q. So let me ask it a different way.
3 Okay. Isn't it true that you cannot determine
4 when groundwater contamination might have occurred
5 at the stations?

6 A. In general, that's true. First
7 occurred or --

8 Q. Correct.

9 A. First occurred? You mean when
10 groundwater contamination first occurred at the
11 stations?

12 Q. Or --

13 A. It's occurring now. We can document
14 that.

15 Q. I understand. Let's say prior to
16 2010 when monitoring started, you cannot determine
17 when groundwater impact may have occurred?

18 A. I cannot.

19 MR. RUSS: I object again. There is
20 a disconnect between what counsel is asking and
21 what he is saying and --

22 HEARING OFFICER HALLORAN: Okay.

23 MR. RUSS: The form of the question.

24 HEARING OFFICER HALLORAN:

1 Overruled. We can clear that up on redirect next
2 year.

3 BY MS. NIJMAN:

4 Q. You would also agree there are no
5 potable wells near any of the stations?

6 A. According to the Patrick reports
7 that I saw, I think Patrick was charged with doing
8 the potable well surveys within a certain radius
9 of the sites and I believe that's correct that
10 there were no -- there are none.

11 Q. In fact, you confirmed that for me
12 during your deposition as well?

13 A. I did, yes.

14 Q. And you would agree that the
15 facilities do not have the possibility to impact
16 offsite drinking water, correct?

17 A. I'm not sure I can answer that
18 positively. It depends on what the source of
19 drinking water is. Groundwater?

20 Q. Would you like to look at your
21 deposition again because that's the exact question
22 I asked you and you answered yes?

23 A. Yes.

24 Q. Okay. So let's look at your

1 deposition then. You would like to see it?

2 A. No.

3 Q. So you agree that the facilities do
4 not have the possibility to impact offsite
5 drinking water, correct?

6 A. If we're talking about wells, that's
7 correct. Yeah, groundwater.

8 Q. Yesterday you stated that you chose
9 boron, manganese and sulfate as your indicators of
10 coal ash, correct?

11 A. Yes.

12 Q. And you said several times yesterday
13 I believe that you would want to see those three
14 indicators together, correct?

15 A. If those -- if those three occur in
16 high concentrations together, it's
17 well-established by EPA, EPRI, the State of
18 Illinois that those three occurring in high
19 concentrations together are the result of coal ash
20 contamination.

21 Q. I very much appreciate your answer,
22 but I asked you actually a very -- and you
23 answered it, but you could have answered it with a
24 yes. So if we could try to move this along.

1 A. The answer is yes.

2 Q. Thank you. You also said yesterday
3 that manganese was still one of your indicator
4 parameters, correct?

5 A. Correct.

6 Q. And you said that's because US EPA
7 has determined it's an indicator, correct?

8 A. IEPA.

9 Q. No.

10 A. US EPA as well.

11 Q. I think you said several. You said
12 IEPA, US EPA, EPRI, right?

13 A. There is lots of possible indicators
14 and I think IEPA was the one that wanted the
15 mercury included.

16 Q. I'm sorry. We're talking about
17 manganese.

18 A. Manganese, yes.

19 Q. And yesterday I believe you said it
20 was -- so let me back up.

21 So now you're saying US EPA
22 doesn't want manganese?

23 A. No, I'm not saying they don't want
24 it. I'm just saying that wasn't I think a high

1 priority on their list of constituents. Neither
2 was it on the EPRI list.

3 Q. Okay. I guess that's a little bit
4 different than what you said yesterday. Now --

5 MR. RUSS: Objection.

6 HEARING OFFICER HALLORAN:

7 Sustained.

8 BY MS. NIJMAN:

9 Q. -- you provided some testimony
10 yesterday about the US EPA's CCR rule, do you
11 remember that?

12 A. Yes.

13 Q. Let's go to the CCR rule since you
14 quote from it. It's tab 406 in the binder. If
15 you could turn to page 21405.

16 A. Okay.

17 Q. 21404. I'm sorry.

18 A. Okay.

19 Q. And in the third column on the
20 right-hand side about halfway down the page it
21 states "Aluminum, copper, iron, manganese and
22 sulfate have been removed because they lack
23 maximum contaminant levels and were not shown to
24 be constituents of concern based on either the

1 risk assessment conducted for this rule or the
2 damage cases," do you see that?

3 A. Yes.

4 Q. So are you aware that the US EPA
5 actually has removed manganese as an indicator
6 parameter for coal ash?

7 MR. RUSS: Object. This does not
8 talk about indicator parameters here.

9 BY MS. NIJMAN:

10 Q. Are you aware that US --

11 HEARING OFFICER HALLORAN:

12 Overruled.

13 BY THE WITNESS:

14 A. I'm aware now, yes.

15 BY MS. NIJMAN:

16 Q. You weren't aware until now?

17 A. Well, it's still -- now, I included
18 manganese I think it was clear in my report
19 because IEPA for these four sites was interested
20 in manganese. As part of the rulemaking for
21 Illinois, they recommended boron, manganese and
22 sulfate.

23 Q. So if you would turn to your
24 rebuttal report dated December 8th, which is

1 Exhibit 407. And on page two of that report this
2 is in your binder I believe Exhibit 407. I'm
3 sorry. Your binder.

4 A. Well, this is the rebuttal -- this
5 is the rebuttal report as well.

6 Q. Okay. You can use that one, too.

7 A. Yeah.

8 Q. Page two of the rebuttal report, the
9 supplemental report it says it as well, first line
10 says "I chose the correct indicator parameters
11 which are those accepted by other experts and
12 regulators, Kosson and others 2009, EPRI 2012,
13 IEPA 2013, US EPA 2015" and then if you go to your
14 references how you define US EPA 2015, that's the
15 CCR rule, correct?

16 A. Let me look. And IEPA is the
17 technical support document.

18 Q. Yes, I understand, but I'm asking
19 you about US EPA. You cite to US EPA as support.

20 A. But that's for all three. I have
21 other references for those three constituents.

22 Q. Okay.

23 A. One of which is IEPA.

24 Q. I understand that. I'm asking you

1 about the CCR rule. The CCR rule --

2 A. Well, I didn't use the CCR rule for
3 manganese.

4 Q. Okay.

5 A. Boron and sulfate is what I used it
6 for.

7 Q. I see. So that was a little
8 confusing from your report.

9 A. The references are there. IEPA 2013
10 was for manganese.

11 Q. I see. So each of these citations
12 was for a different indicator, is that what you're
13 saying?

14 A. Not necessarily. Not necessarily.
15 There's duplicates. IEPA also has boron and
16 sulfate. EPA just has boron -- IEPA has boron,
17 manganese, sulfate and EPA has boron and sulfate.
18 I just lumped them all together --

19 Q. I see.

20 A. -- which is acceptable in my
21 opinion.

22 Q. Are you aware that in the CCR rule
23 US EPA determined that manganese was not shown to
24 be of concern based on the risk assessment they

1 conducted for the rule?

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

3 Q. Were you aware of that prior to now?

4 A. I don't think it disqualifies
5 manganese.

6 Q. Sir, I didn't ask you that.

7 MR. RUSS: I object. I think he can
8 answer however he wants.

9 HEARING OFFICER HALLORAN: It's a
10 yes or no.

11 BY MS. NIJMAN:

12 Q. I need an answer to the question and
13 it's a yes or no question, please. Were you
14 aware?

15 A. Yes, I was aware.

16 Q. You're familiar with the term redox
17 conditions, correct?

18 A. Yes.

19 Q. What does that mean?

20 A. That is oxidation reduction
21 conditions, which -- yeah.

22 Q. And isn't it true that manganese is
23 sensitive to redox conditions in groundwater?

24 A. It is.

1 Q. And as a result manganese would
2 generally be a poor indicator of coal ash
3 leachate?

4 A. It depends on the pH of the
5 groundwater.

6 Q. When we were talking about the CCR
7 rule, there was something I forgot to ask you.

8 You're aware that a petition for
9 reconsideration was filed concerning the CCR rule?

10 A. I don't know what that is. No, I'm
11 not aware.

12 Q. And you weren't involved in the
13 drafting of the CCR rules, were you?

14 A. No.

15 Q. You've also mentioned that you
16 cannot distinguish between whether a potential
17 source for groundwater impact at the stations is
18 the pond or the ash areas?

19 A. Correct.

20 Q. And, in fact, I think in the
21 deposition you told me it would be impossible to
22 distinguish between the potential sources, do you
23 recall that?

24 A. That's a fair statement, yes.

1 Q. Now, we talked about the fact that
2 there are berms around the ponds, correct?

3 A. Yes.

4 Q. And that there is structural ash in
5 those berms?

6 A. I believe that's correct, yes.

7 Q. You're familiar with the term
8 hydraulic head?

9 A. Yes.

10 Q. Are you aware that US EPA in its CCR
11 rule determined not to include old ash landfills
12 in the CCR rules?

13 A. I'm not sure I understand that.

14 Q. Well, the CCR rules do not apply to
15 ash landfill areas, correct?

16 A. Yes.

17 MR. RUSS: Object.

18 HEARING OFFICER HALLORAN: I'm
19 sorry. Hold on. Mr. Russ has an objection.

20 MR. RUSS: The question contained an
21 inaccuracy.

22 HEARING OFFICER HALLORAN: Is that
23 true, Ms. Nijman? Can you rephrase and see what
24 happens?

1 MS. NIJMAN: Let's just turn to the
2 exhibit because that will clarify it for Mr. Russ.

3 MR. RUSS: You said all landfills.

4 MS. NIJMAN: I said old ash
5 landfills.

6 MR. RUSS: You did. And then your
7 second question you said landfills.

8 MS. NIJMAN: Ash landfills.

9 MR. RUSS: That's not accurate.

10 HEARING OFFICER HALLORAN: I'm
11 having a hard time hearing you, Ms. Nijman, as
12 well.

13 MS. NIJMAN: I'm sorry.

14 HEARING OFFICER HALLORAN: I
15 understand the logistics.

16 MS. NIJMAN: Yeah, it's difficult.
17 I'm trying.

18 BY MS. NIJMAN:

19 Q. At tab 406 again of your binder if
20 you would turn to page 21342. Again, in the third
21 column on the right-hand side there is a sentence
22 that begins "Similarly, the requirements of this
23 rule do not apply to inactive CCR landfills --
24 which are CCR landfills that do not accept waste

1 after the effective date of the regulations. The
2 agency is not aware of any damage cases associated
3 with inactive CCR landfills and as noted the risks
4 of release from such units are significantly lower
5 than CCR surface impoundments or active CCR
6 landfills. In the absence of this type of
7 evidence and consistent with the proposal, the
8 agency has decided not to cover these units in the
9 final rule."

10 You were familiar with that
11 provision?

12 A. Yeah, I don't consider the ash
13 disposal areas at the four sites as landfills.
14 They weren't designed as landfills. They were
15 simply coal ash mixed with soils that were used as
16 construction material or ash simply dumped on the
17 surface and then later removed, but maybe the
18 removal wasn't complete. So I don't consider it
19 to be a designed landfill in the engineering
20 sense.

21 Q. Do you believe that US EPA in this
22 statement when they refer to inactive CCR
23 landfills, do you believe they're talking about
24 designed landfills?

1 A. I do. Yes, I do. I mean --

2 Q. What is your basis for that?

3 A. A landfill --

4 Q. Sir, what is your basis for that?

5 A. As an engineer, a landfill to me is
6 very specific. It's some place that is
7 intentionally used for final disposal and it's an
8 engineered facility. In other words, some
9 engineer went out and some contractor actually
10 built the facility and said "We will put ash
11 here."

12 Q. And are you aware of whether that's
13 how US EPA is defining it in the CCR rules?

14 A. No, I have no idea.

15 Q. You're not aware. Thank you.

16 A. All engineers --

17 THE COURT REPORTER: Hold on. I'm
18 two questions --

19 HEARING OFFICER HALLORAN: Okay.
20 Okay. He's two questions --

21 THE COURT REPORTER: Are you aware
22 of how US EPA --

23 BY MS. NIJMAN:

24 Q. Defines an inactive landfill.

1 Answer was "I have no idea."

2 A. I don't think I know how EPA defines
3 it. I know how I define it --

4 Q. Thank you.

5 A. -- and most other engineers.

6 Q. Now, would you turn to page 213 --
7 sorry. We'll have to come back to it because I
8 can't find the second page I wanted to show you.
9 So it was on the page we were already on, page
10 21342. In the second column, the middle column
11 there is a discussion on inactive CCR surface
12 impoundments and I'd like to draw your attention
13 to the statement "As discussed in the proposal,
14 the risks associated with inactive CCR surface
15 impoundments do not differ significantly from the
16 risks associated with active CCR surface
17 impoundments. Much of the risk from these units
18 is driven by the hydraulic head imposed by
19 impounded units," would you agree with that
20 statement?

21 A. May I read it?

22 Q. Of course.

23 A. I don't know exactly where it is on
24 this page here.

1 Q. I'm sorry.

2 HEARING OFFICER HALLORAN: Three
3 quarters of the way down.

4 BY MS. NIJMAN:

5 Q. Starting here.

6 A. Yes, I agree with that statement.

7 Q. And then if you go further down
8 starting at the new paragraph. "The sole
9 exception is for inactive CCR impoundments that
10 have completed dewatering and capping operations,"
11 do you see that?

12 A. Yes.

13 Q. Okay. "EPA considers these units to
14 be analogous to inactive CCR landfills, which are
15 not subject to the final rule."

16 Do you know why US EPA would
17 determine that a dewatered impoundment would not
18 have a risk of -- as they've stated here the risks
19 associated with active impoundments?

20 A. Well, it's not only dewatered. It's
21 capped. So it's essentially a closed facility I
22 guess under EPA's definitions.

23 Q. And it's -- sorry.

24 A. I'm sorry. So all they're saying is

1 that there are additional time restrictions and
2 things likes that, but, again, when they talk
3 about CCR landfills I'm sure EPA means an
4 engineered landfill just like a CCR impoundment.

5 Q. You're making that assumption?

6 A. Yes, I am. And I think it is a
7 correct assumption.

8 Q. Now, yesterday when you were talking
9 about the CCR rules I think you said, correct me
10 if I'm wrong because I'm just going by my notes,
11 you said that the damage cases, you know, in the
12 statement we talked about before it said US EPA is
13 not aware -- decided not to cover inactive
14 landfills because they are not aware of any damage
15 cases associated with inactive CCR landfills and
16 you said damage cases meant situations where
17 someone has claimed money damage?

18 A. I don't believe I said that. I
19 think that was said by counsel.

20 Q. Okay. Because that's not how the
21 CCR rules defines damage, correct?

22 A. No.

23 Q. How does it define damage?

24 A. I don't know exactly, but I know

1 it's not just monetary damages or claims.

2 Q. Now, the CCR rule wasn't adopted
3 until 2015, right?

4 A. Correct.

5 Q. And nowhere in the CCR rules does it
6 say they were adopting an industry standard for
7 pond liners, correct?

8 A. You'll have to explain industry
9 standard to me.

10 Q. Well, yesterday there was some
11 testimony between you and Mr. Russ about the fact
12 that the CCR rule could have been adopting an
13 industry standard for ponds and I'm asking you
14 where in the rule does it say that?

15 A. It probably doesn't say it anywhere
16 in the rule, but try to permit a pond.

17 Q. Let me ask you the next question
18 because that was the one question I asked you.
19 Taking these one at a time.

20 So yesterday when you answered
21 that question, you said "Well, some states have
22 standards, some don't," right?

23 A. Correct.

24 Q. Okay. Illinois did not have

1 regulatory standards for ash ponds prior to the
2 CCR rules, correct?

3 A. I don't know that for sure.

4 Q. Okay. In fact, you're aware that
5 Illinois EPA specifically approved the liner
6 systems that were installed by Midwest Gen,
7 correct?

8 A. I don't know that either, but --

9 Q. Well, you've seen the EPA issued
10 construction permits for the liners, correct?

11 A. I don't believe so, no.

12 Q. I'm afraid you've not seen all the
13 documents relevant to this case, sir.

14 A. There is over 60,000 pages and I
15 haven't seen all 60,000 for sure.

16 Q. Okay. Well, each of the permits --
17 excuse me -- each of the ponds when it was relined
18 need to have a construction permit, correct?

19 A. I -- a construction permit, but --
20 yeah, from IEPA.

21 Q. And that permit outlined how the
22 pond was to be rebuilt?

23 A. You know, I don't know.

24 Q. You don't know.

1 A. You're asking me questions I have no
2 idea --

3 Q. Okay.

4 A. -- what IEPA requires.

5 Q. Fair enough. So you've never seen
6 any of the permits relating to the relining?

7 A. No.

8 Q. Okay. Sir, I'm back on the CCR
9 rules for one more moment. Referencing you to
10 page 21469.

11 A. Yes.

12 Q. At the bottom of the page in the
13 middle column begins a definition of a CCR
14 landfill and recall we were just talking about
15 inactive CCR landfills. This definition does not
16 include an engineered landfill, correct?

17 A. That is what I read.

18 Q. Let me read it.

19 A. Read it, please.

20 Q. "CCR landfill or landfill means an
21 area of land or an excavation that receives CCR
22 and which is not a surface impoundment and
23 underground injection well, salt dome formation,
24 salt bed formation, an underground or surface coal

1 mine or a cave. For the purposes of this subpart,
2 a CCR landfill also includes sand and gravel pits
3 and quarries that receive CCR, CCR piles and any
4 practice that does not meet the definition of a
5 beneficial use of CCR."

6 So reading that definition, sir,
7 your assessment that it had to be an engineered
8 landfill isn't correct, isn't that true?

9 A. To some extent however --

10 Q. Sir --

11 A. -- the ash that is at the sites is
12 mixed and used as fill and construction materials
13 and that's --

14 Q. Structural fill?

15 A. Structural fill, yeah. Well, I
16 don't know structural fill, just fill.

17 Q. And you don't think that's included
18 in this definition?

19 A. No, because this talks about piles,
20 quarries like you have at Joliet.

21 Q. An area of land or excavation that
22 receives CCR?

23 A. Right. Well, those didn't --
24 weren't an area of excavation that received CCR.

1 Q. Do you know that, sir?

2 A. CCR -- yes, CCR is in the fill
3 material so it wasn't an area that was receiving
4 CCR as a method of disposal of a CCR. It was
5 simply mixed in with fill material.

6 Q. So the only areas of old ash that
7 you are concerned about at the stations is the
8 areas that are mixed in with fill material?

9 MR. RUSS: Objection. Objection.

10 HEARING OFFICER HALLORAN: Your
11 objection, Mr. Russ?

12 MR. RUSS: That's misstating his
13 testimony in a large way. I don't know how
14 else --

15 HEARING OFFICER HALLORAN: Can you
16 rephrase, please?

17 MS. NIJMAN: I wasn't attempting to
18 restate testimony. I was asking a question.

19 BY MS. NIJMAN:

20 Q. The question is if you believe that
21 the old ash areas or old ash at the facilities is
22 mixed with fill, are those the areas you're
23 concerned about that somehow don't -- aren't
24 covered by the CCR rule? I'm very confused about

1 your definitions.

2 A. Well --

3 MR. RUSS: I'll object to the
4 question. It's compound and unclear. Vague.

5 HEARING OFFICER HALLORAN: He can
6 answer if he's able.

7 BY THE WITNESS:

8 A. Well, I've testified by referring to
9 the drillers log that there's ash outside the
10 ponds. That ash is clearly not in any kind of a
11 pile or a disposal area, an excavation, it's just
12 there because it was mixed in with -- to use as
13 fill around the ponds or under the ponds or --

14 Q. Berms.

15 A. Berms, things like that and I don't
16 think -- my reading of this that is not covered by
17 the CCR rule.

18 Q. What about the Joliet areas that you
19 testified about?

20 A. That could clearly be under the rule
21 considered to be an old ash disposal area.
22 However, it doesn't mean it's not causing
23 contamination to groundwater.

24 Q. So that would be covered under this

1 definition?

2 MR. RUSS: I'm going to object to
3 asking for legal conclusion from --

4 HEARING OFFICER HALLORAN: That's
5 permitted. Overruled.

6 MS. NIJMAN: Thank you.

7 BY MS. NIJMAN:

8 Q. Let's look at Complainants' Exhibit
9 260 and try to pull it out. It should be
10 somewhere in front of you. 260.0.

11 MR. RUSS: O.

12 BY MS. NIJMAN:

13 Q. Group O of complainants. This is
14 second quarter 2017 Powerton groundwater
15 monitoring report.

16 A. Yeah, it's here somewhere in this
17 stack.

18 Q. It was there before.

19 HEARING OFFICER HALLORAN: What page
20 are we on?

21 THE WITNESS: There it is.

22 MS. NIJMAN: I haven't gotten that
23 far.

24 HEARING OFFICER HALLORAN: I'm

1 sorry. First time I'm ahead of you.

2 THE WITNESS: I found it. Well,
3 there is a clip here. It came off. Yes, I have
4 it.

5 BY MS. NIJMAN:

6 Q. Great. Looking at page Midwest Gen
7 Bates 62535.

8 A. Yes.

9 Q. And for the record we are looking at
10 the quarterly groundwater monitoring report
11 Powerton Generating Station July 5th, 2017,
12 Complainants' Exhibit 260.O.

13 MR. RUSS: What page are we looking
14 at?

15 MS. NIJMAN: It's 6 -- 62540, the
16 drawing. Contour map 62540.

17 BY MS. NIJMAN:

18 Q. Now, this is the contour map for the
19 gravelly sand unit, correct?

20 A. Yes.

21 Q. And it shows the former ash basin
22 area, do you see that?

23 A. Yes.

24 Q. And that's drawn both below and

1 above the rail line there, do you see that?

2 A. Yes.

3 Q. And your map I think you had it as
4 one large area, correct, the maps that you showed
5 in your demonstratives?

6 A. I think it was one of these
7 drawings --

8 Q. Okay.

9 A. -- by KPRG.

10 Q. Okay.

11 A. It was that drawing. Well, similar
12 to that. It was -- yeah, that but with different
13 contours.

14 Q. Now, I believe you testified, and
15 again I'm going by memory so tell me if I'm
16 incorrect, that monitoring wells -- well, do you
17 recall yesterday testifying about the monitoring
18 wells that are around this former ash basin?

19 A. Yes, I do.

20 Q. Okay. And MW-2, 3, 4 and 5 would
21 all be down gradient of that former ash basin?

22 A. Yes, under normal conditions they
23 would be.

24 Q. And that's because if you look at

1 the contour lines the lines are going towards
2 those wells, correct?

3 A. I'm not sure which unit. I guess
4 those are completed in the gravelly sand unit.

5 Q. That's right.

6 A. Okay. Yes.

7 Q. Okay. And MW-1 I guess you'd say
8 is, what, side gradient?

9 A. Yeah, cross gradient.

10 Q. Okay. So let's go to the tables in
11 the report at MW 62545.

12 Now, this table shows the last
13 eight quarters of groundwater sampling, correct?

14 A. Yes.

15 Q. From 5/11/2015 to 5/3/2017.

16 A. Yes.

17 Q. And starting with monitoring well
18 one on page Bates 42545 let's look at boron, one
19 of your -- one of the indicator parameters that
20 you've testified about.

21 Now, looking at the last eight
22 quarters at no time are the boron levels above the
23 Class 1 standard of two, correct?

24 A. Correct.

1 Q. And, in fact, the last three
2 quarters, November 2016, February 2017 and May
3 2017, were all even below the background levels
4 that you applied, correct?

5 A. Correct.

6 Q. Let's look at manganese on this same
7 page. The manganese Class 1 standard in Illinois
8 is 0.15. For the past eight quarters from May
9 2015 through May 2017, manganese in MW-1 is below
10 the Class 1 standard of 0.15, correct?

11 A. Correct.

12 Q. And, in fact, all but two of the
13 samples are actually non-detect, correct?

14 A. Correct.

15 Q. Let's look at sulfate. Again, the
16 last eight quarters. Sulfate in MW-1 is below the
17 Class 1 standard of 400 milligrams per liter,
18 correct?

19 A. Correct.

20 Q. Let's look at MW-2 next page. This
21 is on Bates page Midwest Gen 62546. Again,
22 looking at boron, for the past eight quarters
23 concentration of boron in MW-2 is below the Class
24 1 standard, correct?

1 A. Correct.

2 Q. In fact, two of the last four
3 results are below your background that you have
4 applied, correct?

5 A. Correct.

6 Q. Let's look to manganese. Class 1
7 standard for manganese being 0.15, for the past
8 eight quarters manganese in MW-2 is below the
9 Class 1 standard, correct?

10 A. Correct.

11 Q. In fact, all but two of the samples
12 are non-detect?

13 A. Correct.

14 Q. Look at sulfate. Concentration of
15 sulfate in MW-2 is below the Class 1 standard
16 consistently, correct?

17 A. Correct.

18 Q. Let's go to MW-3. Next page. Bates
19 62547. For the past eight quarters from May 2015
20 through '17, boron in MW-3 is all below the Class
21 1 standard, correct?

22 A. Correct.

23 Q. Manganese past eight quarters
24 concentration of manganese in MW-3 is below the

1 Class 1 standard, correct?

2 A. Correct.

3 Q. In fact, all but two of the samples
4 are non-detect, correct?

5 A. Correct.

6 Q. Sulfate. For the past eight
7 quarters, concentration of sulfate in MW-3 is
8 below the Class 1 standard, correct?

9 A. Correct.

10 Q. Let's go to next page MW-4. This is
11 now Midwest Gen Bates 62548 for monitoring well
12 sample MW-04. If we look at boron, past eight
13 quarters concentration of boron is all below the
14 Class 1 standard, correct?

15 A. Yes.

16 Q. Look at the line for manganese, past
17 eight quarters concentration of manganese in MW-4
18 is below the Class 1 standard, correct?

19 A. Yes.

20 Q. Three of the quarters are
21 non-detect, correct?

22 A. Correct.

23 Q. For sulfate, past eight quarters
24 concentration of sulfate at MW-4 is below the

1 Class 1 standard, correct?

2 A. Correct.

3 Q. One more. MW-5. This is Bates page

4 62549. Looking at boron past eight quarters

5 concentration of boron in MW-5 is all below the

6 Class 1 standard, correct?

7 A. Correct.

8 Q. Looking at the line for manganese.

9 For the past eight quarters, concentration of
10 manganese are all below the Class 1 standard,
11 correct?

12 A. Correct.

13 Q. And same for sulfate, all below the
14 Class 1 standard, correct?

15 A. Correct.

16 Q. So in the review of the past eight
17 quarters of groundwater monitoring results for the
18 wells that we've identified as down gradient of
19 the former ash basin, none of those wells have
20 concentrations above the Class 1 standards,
21 correct?

22 A. Correct.

23 Q. Okay.

24 MS. NIJMAN: I don't know what

1 you're thinking as far as timing of an afternoon
2 break.

3 HEARING OFFICER HALLORAN: 3:00-ish.

4 MS. NIJMAN: Okay.

5 BY MS. NIJMAN:

6 Q. Now, you opined -- I honestly don't
7 remember if it was this morning or yesterday, but
8 in your testimony at some point you stated that
9 you did not believe that the Tannery or the
10 General Boiler property, and correct me if I'm
11 wrong, are contributing to contamination --
12 groundwater contamination at the sites, correct?
13 Was that your testimony?

14 A. Yes.

15 Q. Okay.

16 A. Well, not exactly. I think I did
17 testify that I felt that there was -- were
18 contaminants coming onto the property from the
19 General Boiler state and the Tannery site, but
20 they weren't necessarily related to coal ash
21 contamination.

22 Q. Because you are referring to the
23 arsenic plume?

24 A. Or TDS in general, possibly other

1 constituents which I didn't look at in detail.

2 Q. Okay. Now, do you recall when I
3 deposed you you told me that you had no
4 information about any old ash on the Tannery
5 property --

6 A. That's correct.

7 Q. -- do you recall that? You
8 mentioned that there is a historic ash area.

9 MS. NIJMAN: Can we get the map of
10 Waukegan with the historic areas on it.

11 BY MS. NIJMAN:

12 Q. You did tell me that there was an
13 old ash area to the north of the Tannery property,
14 right?

15 A. No, I wouldn't have been interested
16 in anything north of the Tannery property because
17 that doesn't impact.

18 Q. I understand. But -- you didn't
19 think it was impacting, but you said it existed?

20 A. I don't remember that I said that.
21 I don't think I ever --

22 Q. I'm going to show you a deposition
23 transcript. I don't think I made this up.

24 MR. RUSS: Is it the same -- I'm

1 sorry. This is the Colstrip deposition. Thank
2 you.

3 MS. NIJMAN: You're welcome.

4 BY MS. NIJMAN:

5 Q. Looking at page 146 of your
6 deposition transcript. So starting at line 7 I
7 asked you

8 Q. And given that the prior
9 owner of the Tannery was a coal company, isn't it
10 likely that there is historic ash on that
11 property?

12 A. On the Tannery site?

13 Q. Uh-huh.

14 A. There could be, but we
15 don't -- I don't have any information that
16 indicates there was ash on the Tannery site. I
17 have information there was ash north of the
18 Tannery site and maybe north of the General Water
19 site. I think you meant General Boiler site.
20 Because I don't think I had well logs at the
21 Tannery site, but it's inconsequential to my
22 conclusions.

23 A. Correct.

24 Q. So does that refresh your

1 recollection that you mentioned an ash area to the
2 north of the Tannery site?

3 A. Yes.

4 Q. I'd like to show you a document
5 that's been produced in this case. I don't know
6 if you've seen it or not. Midwest Gen 51281.

7 HEARING OFFICER HALLORAN: 51261?

8 MS. NIJMAN: Yes. Sorry. My own
9 typo.

10 BY MS. NIJMAN:

11 Q. Do you recall seeing this document
12 at all?

13 A. I have seen it, yes.

14 Q. Okay. Now, for the record, this is
15 dated September 4th, 2012, on Midwest Gen Bates
16 51261 through 51296 and it is a supplemental
17 response letter to the violation notice issued by
18 Illinois EPA for the Waukegan Generating Station,
19 would you agree with that?

20 A. Yes.

21 Q. Now, if you look at 51281.

22 A. Yes.

23 Q. In the second full paragraph
24 starting "In 1998 and 1999, further environmental

1 analysis were performed on portions of this
2 property and it was confirmed that the northern
3 section contained arsenic above the remediation
4 benchmarks in a fly ash fill area because, quote,
5 the remedial objectives and/or remedial action for
6 the fly ash area had yet to be developed, close
7 quote, the cleanup possibilities for this area
8 could not be determined."

9 Were you aware there was a fly
10 ash fill area on that property?

11 A. On the --

12 Q. On the Tannery property.

13 A. No.

14 Q. Okay. Now, you would also agree
15 that there is at least some component of
16 groundwater from the General Boiler property that
17 flows onto the Midwest Gen property, correct?

18 A. Correct.

19 Q. And, in fact, monitoring from the
20 General Boiler property shows exceedances of
21 manganese, correct?

22 A. Correct.

23 Q. So, in fact, manganese from the
24 General Boiler property is impacting the Midwest

1 Gen property, correct?

2 A. Yes.

3 Q. Are you familiar with the term ELUC,
4 E-L-U-C?

5 A. I am.

6 Q. What does that mean?

7 A. Environmental land use whatever the
8 C stands for.

9 Q. Control.

10 A. Control. I'm sorry. You're right.

11 Q. It's all right. Have you ever
12 worked on putting an ELUC in place in Illinois?

13 A. No.

14 Q. Now, are you aware that the owner of
15 the Tannery property has established an ELUC on
16 the Midwest Gen property?

17 A. Yes, I am.

18 Q. And, in fact, you've identified the
19 ELUC wells in several of your maps, correct?

20 A. Correct.

21 Q. Now, what is -- is it fair to say
22 that the purpose of an ELUC is to ensure there is
23 no access to groundwater, correct?

24 A. Yes.

1 Q. And you're aware that you -- well,
2 you may not be aware.

3 In Illinois, are you aware that
4 ELUC's get established based on either evidence of
5 an actual impact to property or based on a model
6 that shows where contamination might occur?

7 A. I believe you. I don't know how
8 they're established.

9 MS. NIJMAN: Let's -- can we show
10 the Waukegan map with the ELUC, the ELUC from the
11 Tannery property.

12 BY MS. NIJMAN:

13 Q. Okay. So please correct me if I'm
14 wrong, the Tannery property reaches from I believe
15 the north end of the Midwest Gen property to the
16 west of the Midwest Gen property, Tannery property
17 goes all the way down to the south of the Midwest
18 Gen property, correct?

19 A. Yes, I believe so.

20 Q. So it's completely to the west. And
21 then this open space here is what we have been
22 calling the General Boiler property, correct?

23 A. Correct.

24 Q. This is the area of the ELUC that

1 the Tannery property obtained over the Midwest Gen
2 site as the area for the ELUC, correct?

3 A. Yes.

4 Q. And so that would be the area that
5 they either had evidence of impact or a model
6 showing evidence that impact would occur, correct?

7 A. Yes.

8 Q. Would you look at your supplemental
9 report dated December 8th. Tell me which one you
10 just pulled out.

11 Did you pull out the second
12 supplemental report --

13 A. Yes.

14 Q. -- the March 9th one?

15 A. March 9th.

16 Q. Okay. Let me find the right page.
17 On page three of that report, there is a statement
18 the last full paragraph on the page.

19 A. Yes.

20 Q. We're talking about Waukegan here
21 and the Tannery property and you say "This is
22 highly unlikely for three reasons. First reason
23 is the groundwater flow away from the Tannery
24 site, not towards the coal ash ponds."

1 HEARING OFFICER HALLORAN: Can you
2 speak up a little, please. Thank you, Ms. Nijman.

3 MS. NIJMAN: Sorry. I keep turning
4 the wrong way from you.

5 BY MS. NIJMAN:

6 Q. I'm interested in number two which
7 says "The concentrations of boron in the MW-10
8 through MW-14 (MW-13 is inactive) ELUC monitoring
9 wells are the direct result of these wells having
10 their screens completed in coal ash," do you see
11 that statement?

12 A. Yes.

13 Q. So you're discussing the ELUC wells
14 having screens completed in coal ash, correct?

15 A. That's what the report says, yes.

16 Q. But, in fact, you have never seen
17 boring logs for those monitoring wells, have you?

18 A. I've seen boring logs next to those
19 monitoring wells.

20 Q. Which boring logs, which wells are
21 you talking about?

22 A. I'm talking about the ENSR wells B1,
23 whatever they are, B4, B --

24 Q. Well, those are on the Tannery

1 property, correct?

2 A. Those are right next to the ELUC
3 wells. I could point them out to you.

4 Q. Okay. Which map would you like to
5 use?

6 MR. RUSS: I don't know.

7 BY MS. NIJMAN:

8 Q. One of your reports?

9 A. Yes.

10 MR. RUSS: I can help you try to
11 find it, but we have to start with your report.

12 THE WITNESS: Yeah, that's what I'm
13 after.

14 MR. RUSS: So in your first report.

15 HEARING OFFICER HALLORAN: Let's go
16 off the record for a little bit.

17 (Whereupon, a break was taken
18 after which the following
19 proceedings were had.)

20 HEARING OFFICER HALLORAN: Let's
21 take a break now for about 15 minutes.

22 (Whereupon, a break was taken
23 after which the following
24 proceedings were had.)

1 HEARING OFFICER HALLORAN: We're
2 back on the record. Mr. Russ, you wanted some
3 housekeeping matters attended to?

4 MR. RUSS: Yes. Thank you. Just
5 to -- earlier in the proceeding, I can't remember
6 exactly when, Monday we had quarterly groundwater
7 monitoring results for the first quarter of 2012
8 from Powerton and we had originally tried to
9 introduce a version that had not been amended and
10 we said we would replace it with the amended
11 version.

12 MR. BUGEL: We're not replacing it.
13 We're adding.

14 MR. RUSS: Adding.

15 MR. BUGEL: Yes.

16 MR. RUSS: I'm sorry. This is a --
17 this would be Exhibit 24.5E. These aren't all
18 marked.

19 MS. NIJMAN: They're all --

20 MR. RUSS: It's the one that -- the
21 exhibit that it amended was 24E and so the amended
22 version is going to be 24.5E.

23 MR. BUGEL: Yes.

24 MR. RUSS: Okay. I'll show you

1 copies.

2 MS. NIJMAN: Sorry. Do you have a
3 copy? Sorry. You're just marking it.

4 MR. RUSS: Yes.

5 MS. NIJMAN: Got it.

6 MR. RUSS: I move to introduce
7 Exhibit 24.5E.

8 (Document marked as Complainants
9 Exhibit No. 24.5E for
10 identification.)

11 HEARING OFFICER HALLORAN: Any
12 objection?

13 MS. NIJMAN: No objection.

14 HEARING OFFICER HALLORAN: Okay.
15 Complainants' Exhibit 24.5E is admitted.

16 MR. RUSS: And the other thing is I
17 neglected to move to admit the demonstrative
18 exhibits from Dr. Kunkel's direct. So I move to
19 admit demonstrative exhibits at the back of the
20 binder.

21 HEARING OFFICER HALLORAN: Ms.
22 Nijman? I know there is at least one in here.

23 MS. NIJMAN: No objection, your
24 Honor.

1 HEARING OFFICER HALLORAN: Okay.

2 Thank you. Mr. Russ's motion to enter the
3 demonstrative in the back of this binder --

4 MR. RUSS: Do you want to give it an
5 exhibit number?

6 HEARING OFFICER HALLORAN: Yes,
7 let's do that.

8 MR. RUSS: It would be -- going with
9 the numbering in the binder, I believe it would be
10 Exhibit 411.

11 HEARING OFFICER HALLORAN: All
12 right. I'm marking it as Complainants' Exhibit,
13 demonstrative exhibit, Exhibit 411 and that's
14 admitted.

15 MR. RUSS: Thank you. That's all I
16 have.

17 HEARING OFFICER HALLORAN: Can you
18 give me a second, please. Okay. I'm ready.

19 BY MS. NIJMAN:

20 Q. Dr. Kunkel, during the break, I
21 referenced for you Figure 16 of your July 2015
22 report, do you have that in front of you?

23 A. Yes.

24 Q. And Figure 16 you were saying you

1 could see the wells that explain your statement in
2 your report of December 8th, 2015?

3 A. No, not exactly.

4 Q. Okay. What -- what did you need to
5 see to --

6 A. What I'm referring to is companion
7 bore holes that are right next to those wells in
8 the ENSR environmental site assessment report in
9 Waukegan.

10 Q. So you're saying that there are
11 companion bore holes next to the ELUC wells?

12 A. Yes, or where the ELUC wells are.
13 They're called MW-11 and MW-12 and the -- in the
14 ENSR and I assume those are the same MW wells.

15 Q. Okay. And any others?

16 A. Well, those aren't the bore holes.
17 Those are just the wells that I show here 11, 12,
18 13 doesn't exist anymore, 14 unfortunately isn't
19 shown, but there is a B14 which is right near
20 MW-14. It's called B14 and these are bore holes
21 and why that ELUC well isn't shown I don't know,
22 but the bore hole is right where the --

23 Q. Okay. I'm getting very confused.

24 Tell me what bore holes you rely on to state that

1 there is ash in MW-11.

2 A. B1. ENSR --

3 Q. What hole --

4 A. -- bore hole B1.

5 Q. Thank you. What bore hole do you
6 rely on to state there is ash in MW-10?

7 A. I'm going to rely on B14. It isn't
8 really ash. It's coal, but it weathers the same
9 as ash and because it's wet at the time they did
10 the bore hole the oxidation of the coal gives off
11 the same constituents as ash. It's just a bigger
12 particle. Think of it as a very large ash
13 particle instead of a smaller ash particle.

14 Q. Are you saying it wouldn't behave
15 differently?

16 A. It probably won't behave
17 differently. It will weather -- the surface of
18 the coal will weather and give off boron,
19 manganese, sulfate.

20 Q. So, I'm sorry. Tell me again for
21 MW-10 the --

22 A. B14.

23 Q. B14. And how close is that to
24 MW-10?

1 A. To MW-10. It's either near 10 or
2 near 14, but they're pretty close together,
3 within, you know, 20 or 30 feet it would appear.
4 I can't tell. I have to scale it.

5 Q. So you're saying B14 is within 20 to
6 30 feet of --

7 A. Well, I don't know. I'm just saying
8 B14 is near MW-11 and 12. That's the best I can
9 say. Okay. B1 is near -- is plotted right
10 next -- or right near MW-11 and, again, this is
11 the result of a plot on a map and so we know it's
12 close.

13 Q. But you don't know how close?

14 A. Of course I don't know how close.

15 Q. Well, isn't there a standard
16 where --

17 A. No.

18 Q. Excuse me, sir. I'm asking a
19 question.

20 HEARING OFFICER HALLORAN: Sir,
21 Dr. Kunkel.

22 BY MS. NIJMAN:

23 Q. Sir, let me ask the question and
24 then you can decide how you'd like to answer it.

1 Doesn't a well need to be within
2 a certain distance of another well before you can
3 assume that it contains the same material?

4 A. No, and these are not wells -- one
5 is a well, one is a boring, is a bore hole.

6 Q. Understood.

7 A. Yeah.

8 Q. Don't they still need to be within a
9 certain distance before you can assume they are
10 the same material?

11 A. No.

12 Q. You're aware of that in the State of
13 Illinois, aren't you?

14 A. I'm not aware of that in the State
15 of Illinois --

16 Q. Thank you.

17 A. -- but in my professional practice
18 indicates that if you have a boring close to a
19 well, then it probably represents what is at the
20 well is equally --

21 Q. And you believe -- sorry.

22 A. -- or close. Yes, I do believe
23 that.

24 Q. I'm waiting to ask a question. You

1 believe that you can judge how close it is?

2 A. I can't judge how close it is by
3 their plots.

4 Q. Okay. And what is the bore hole
5 that is next to MW-15?

6 A. Oh, MW-15. There is not one near
7 MW-15, but we have other borings down in that area
8 or other wells.

9 Q. Like what?

10 A. MW-12 is the next one.

11 Q. What is near MW-15 that shows you
12 there is ash there?

13 A. We don't have one at MW-15, okay,
14 but we do at 12, MW-12.

15 Q. What is near MW-12?

16 A. B15. The answer is boring 15.

17 Q. So I need to ask you. You're
18 looking at Figure 5 of the ENSR Phase Two --

19 A. Yes.

20 Q. -- Environmental Assessment Comp
21 Exhibit 19D, 19D. And if you look at the table on
22 the right, there is a note here that says "Note.
23 All dimensions and locations are approximate," do
24 you see that?

1 A. Correct.

2 Q. I'd like to go back to your
3 statement in your report on page three of your
4 report that said "Concentrations of boron in MW-10
5 through 14 ELUC wells are the direct result of
6 these wells having their screens completed in the
7 coal ash."

8 So my initial question to you
9 was you do not have boring logs for those wells,
10 do you?

11 A. No, I don't, but I have --

12 Q. Sir, please. I'm sorry. It's late
13 in the day. We just need the yes. You do not
14 have boring logs for those wells, correct?

15 A. Correct.

16 Q. Thank you. I'm going to switch
17 gears a little bit and go to your demonstrative
18 exhibits.

19 Specifically, the table you've
20 been referring to at the back, the very end of
21 your demonstratives, do you have it in front of
22 you?

23 A. Yes.

24 Q. Now, as I understand this when you

1 have totaled these numbers up you've included any
2 monitoring well result from up gradient monitoring
3 wells, correct? In other words, you haven't
4 distinguished whether they're up gradient or down
5 gradient, it's just all the wells, correct?

6 A. Correct.

7 Q. And you said these tables are based
8 on the data that precedes it, correct?

9 A. Correct.

10 Q. The data includes exceedances or
11 above the Class 1 standards since we're not using
12 the nasty E word. If you look on page 12, for
13 instance, do you see -- sorry. I'll wait for you
14 to get there.

15 A. I'm there.

16 Q. You say that there's a series on
17 line 590 at Powerton, there's a series of
18 constituents listed for nitrogen and nitrate, do
19 you see that?

20 A. Yes.

21 Q. And how are those related to coal
22 ash?

23 A. How are they related to coal ash?

24 Q. Those aren't one of the parameters

1 the Federal Register, for instance, the CCR rules,
2 requires monitoring for coal ash, correct?

3 A. Correct.

4 Q. And there were a couple others that
5 surprised me. There are references here to
6 vanadium?

7 A. Yes.

8 Q. Vanadium is not required to be
9 monitored under these coal ash rules, the federal
10 coal ash rules either, correct?

11 A. That's correct.

12 Q. So there is constituents in here
13 that aren't at all consistent with coal ash, are
14 they?

15 A. I think vanadium is a possible
16 contaminant to coal ash. It's just not required
17 by EPA to be monitored because it's usually in
18 very low concentrations.

19 Q. What about the nitrogen?

20 A. Nitrate -- I don't -- nitrogen --
21 it's nitrate nitrogen, not nitrogen nitrate. It's
22 nitrate nitrogen which is the reduced form of
23 nitrogen, NO₂.

24 Q. Okay.

1 A. It's nitrogen nitrate, but that's
2 what it means. It's the NO2 form, not the NO3
3 form as far as I can tell.

4 Q. These are your tables, correct?

5 A. These are tables that were block
6 copied from the data, correct. I think we brought
7 copies. I didn't prepare these tables.

8 Q. You said you relied on them and they
9 informed your decisions?

10 A. I reviewed them and I relied on them
11 as they tabulated the numbers, the total value --
12 the total number of values that were greater than
13 the Illinois Class 1 water quality standard.

14 Q. Mm-hmm. And you've included
15 nitrogen nitrate?

16 A. Somebody else did the analysis and
17 put them in the database.

18 Q. So you would agree that that
19 nitrogen nitrate is likely not a coal related --

20 A. No, I don't agree with that. I
21 think it probably is something that would come
22 from coal ash.

23 Q. So, in your opinion, everything on
24 page 1 through 37 would come from coal ash?

1 A. It could.

2 Q. It could?

3 A. I don't know why it would be listed
4 on this table if it wasn't something that someone
5 had measured.

6 Q. Well, for instance --

7 A. Was it measured by -- by Midwest?

8 Q. I don't know where this table comes
9 from, sir.

10 A. I don't know either.

11 Q. You don't either, you said?

12 A. I didn't prepare it, no. I didn't
13 prepare the table.

14 Q. You testified you relied on the
15 table.

16 A. I testified that I reviewed the
17 table and then I am relying on the values on
18 table -- Summary Table 3 for boron, manganese and
19 sulfate. It's the only three values that I've
20 relied on.

21 Q. Okay. So none of the rest of this
22 you've relied on?

23 A. No.

24 Q. And you've already testified I

1 believe that Summary Tables 3, 2 and 1 are based
2 on pages 1 through 37?

3 A. That's my understanding, yes.

4 Q. And so you counted up the
5 violation, the situations or the instances above
6 Class 1 standards. So Table 3, the final table,
7 does not account for any wells that are within the
8 groundwater management zone, is that correct?

9 A. The groundwater management zone at
10 which site?

11 Q. At -- three of the facilities have
12 groundwater management zones, correct?

13 A. Correct.

14 Q. Do you know which facilities they
15 are?

16 A. Yeah, I think they're Joliet,
17 Waukegan and Powerton, I believe, right?

18 Q. It's Joliet, Will County and
19 Powerton have groundwater management zones.

20 A. Sorry.

21 Q. That's fine. And are those
22 groundwater management zones you're aware -- I
23 believe you've been informed that groundwater
24 management zones, meaning the Class 1 standards,

1 do not apply.

2 So I'm questioning does Summary
3 Table 3 contain totals for all of the wells that
4 are within the groundwater management zone?

5 A. Yes.

6 Q. Even though the standard does not
7 apply to those wells?

8 A. Yes.

9 Q. Okay. Now, it's true, is it not,
10 then that the number of results greater than the
11 Illinois Class 1 standard listed on these tables
12 is simply based on the number of times Midwest Gen
13 sampled, correct?

14 A. It's only from the Midwest Gen
15 quarterly -- quarterly data, yes.

16 Q. But you counted up each time Midwest
17 Generation sampled and determined any constituent
18 above Class 1 standards and put them in this
19 table, correct?

20 A. Can I point you to a page in the
21 document here? I'll show you how we did it.

22 Q. Sure.

23 A. If you go to page 1 of 37.

24 Q. Mm-hmm.

1 A. These are the results and there are
2 one, two, three, four, five, six, seven columns
3 and the columns we're interested in are the one
4 marked value in milligrams per liter and standard,
5 okay, and all -- all we did was we used an Excel
6 spreadsheet and we counted the number of times
7 that the standard in milligrams per liter was
8 greater than the value and that was a one, counted
9 as a one and we went right down the list and
10 picked out all the values for all the constituents
11 which you can do in Excel, you just do that search
12 and -- and the Excel program counted those and put
13 them in this table.

14 Q. But here is the problem I'm having.
15 The number of exceedances is a function then of
16 the sampling frequency, correct?

17 A. Yeah, obviously.

18 Q. In other words, if I had gone out
19 there and sampled every day, you would have found
20 12 millionths alleged results above the Illinois
21 Class 1 standard?

22 A. But I don't understand what that has
23 to do with anything.

24 Q. I'm just saying that you're

1 essentially punishing Midwest Gen by this table by
2 just counting the number of times that they --

3 MR. RUSS: I'm going to object.

4 HEARING OFFICER HALLORAN:

5 Sustained. Withdraw the question. Please
6 rephrase that.

7 BY MS. NIJMAN:

8 Q. You are showing in this table solely
9 based on the number of times sampled that there
10 are, quote, results greater than Class 1, correct,
11 based on the sampling frequency, correct?

12 A. Yes.

13 Q. So if Midwest Gen had only sampled
14 annually --

15 A. Yes.

16 Q. -- we'd have a much lower number,
17 correct?

18 A. Yes.

19 Q. Now, if this table then is counting
20 the data points that are above the Class 1
21 standard, what I'm going to try to do is put a
22 little perspective on that number.

23 So this is measured as I
24 understand it from fourth quarter 2010 through

1 second quarter 2017, correct?

2 A. Correct.

3 Q. That's 27 rounds of sampling?

4 A. Not at every well. I mean --

5 Q. There is a couple that are
6 different. We'll get into that.

7 A. Okay.

8 Q. But it's 27 rounds.

9 A. It's 27, yes, sampling times.

10 Q. Mm-hmm. So at Joliet 29 there are
11 11 wells --

12 A. Mm-hmm.

13 Q. -- times 27 rounds --

14 A. Mm-hmm.

15 Q. -- that's 297 data points?

16 A. Correct.

17 Q. At Powerton, we have 15 wells that
18 were taken 27 times and one well taken 19 rounds,
19 that's what you were saying, there are some wells
20 that are different, does that sound correct at
21 Powerton?

22 A. Yes.

23 Q. Okay. So that gives us 424 data
24 points. At Waukegan, we have five wells that were

1 sampled 27 times and we have two wells that were
2 sampled 19 times. So that gives us 173 data
3 points, does that sound right?

4 A. Yes.

5 Q. Then at Will County we have 10 wells
6 sampled 27 rounds, that's 270 data points. So
7 ultimately we have 1,164 data points, does that
8 sound right?

9 A. At all four sites?

10 Q. Yes, all together. Because that's
11 what you've done here. You've combined them all?

12 A. Yes.

13 Q. Okay. Now, we have 13 parameters on
14 your list here, right?

15 A. Yes.

16 Q. Okay. So if I take that number
17 times 13, I come up with 15,132 data points total.
18 Okay? You can check my math. 15,132 data points.
19 So this table shows a total of 1,808 data points
20 that have a result above the Class 1 standard out
21 of 15,132 data points. That's about 11 percent if
22 I'm doing the math correctly in my head.

23 A. Yes.

24 Q. And, to confirm, the CCR data is not

1 in these tables, correct?

2 A. I don't believe so, no.

3 Q. Would you like to stop? Are you
4 okay?

5 A. No, I'm just --

6 Q. You looked like you might have had
7 the same headache --

8 A. I have no idea where you're going
9 with this. So I'm a little glazed over.

10 HEARING OFFICER HALLORAN: We just
11 have about 20, 25 more minutes --

12 THE WITNESS: I'm fine. Believe me
13 I'm fine.

14 HEARING OFFICER HALLORAN: -- then
15 I'm going to call it a day.

16 THE WITNESS: I just don't -- so I
17 understand what's going on.

18 BY MS. NIJMAN:

19 Q. I'd like to refer in your
20 demonstratives to the tables that you have -- the
21 graphs that you put together for Joliet and the
22 rest of this document is not numbered so I can't
23 give you a page number. Somewhere around the
24 fifth or sixth page in.

1 A. I can find my well number in Joliet.

2 Q. So you presented these graphs
3 yesterday about Joliet 29 and you went through
4 each graph and you said whether there was an
5 increasing trend or a decreasing trend, correct?

6 A. Just an eyeball, yes.

7 Q. Right. We --

8 A. We went over that.

9 Q. Right. Exactly. And those were
10 your visuals, your eyeball, and that you didn't do
11 a statistical analysis, correct?

12 A. Correct.

13 Q. Now, on your graphs that you
14 presented, you compared constituents to
15 background, correct?

16 A. Correct.

17 Q. And so even though -- and the other
18 thing I'm curious about with these graphs is that
19 the scale seems to change from graph to graph,
20 correct?

21 A. Correct.

22 Q. So that was so you could show it all
23 on one page, correct?

24 A. No, that was so I could show a

1 realistic range of concentrations at the given
2 well. Because if I plotted them all at the same
3 scale, say all the sulfates were 1 to 15,000
4 because I had one well that had 15,000, then all
5 of these would plot as a straight line and it
6 wouldn't be as meaningful I didn't think anyway to
7 the board as what I had done here. So, yes, each
8 plot has its own --

9 Q. Scale.

10 A. -- ordinate. Abscissas are the
11 same. Ordinates are different.

12 Q. Right. So you have to be very
13 careful when you look at the graphs to make sure
14 you're looking at the right scale?

15 A. It's incumbent upon the reader to
16 understand what the concentration scale is. Some
17 of them go from 0 to 0.4. Some of them go from 0
18 to 40.

19 Q. Right. So, in fact, on some of
20 these graphs, you don't even -- you can't even
21 plot the Class 1 standard because it's way off the
22 scale, correct?

23 A. Well, I can plot it.

24 Q. Well, but it's way off the graph as

1 you have presented it?

2 A. It is in some cases, yes.

3 Q. Okay. So I went through your
4 documents and I did that. I tried to even out the
5 scale. So here is your first well for boron at
6 Joliet 29 and here is the photograph you provided.
7 Here is the Class 1 standard. You also told me it
8 was decreasing. Let's look at the next one.

9 MR. RUSS: I have to object to that.
10 I don't know what's going on.

11 HEARING OFFICER HALLORAN: I'm
12 sorry?

13 MR. RUSS: I don't know what she did
14 to his charts. I don't understand. We can't
15 verify that that's accurate.

16 HEARING OFFICER HALLORAN: Ms.
17 Nijman?

18 MS. NIJMAN: As a demonstrative,
19 I've taken Mr. Kunkel's papers and placed the
20 Class 1 standard on them. That's all. It's
21 his -- that's why I put it here. I based it on
22 exactly what he did.

23 MR. RUSS: I can withdraw my
24 objection, but can you just explain a little bit

1 more? I don't totally understand.

2 MS. NIJMAN: I guess I'm not
3 really -- is there an objection?

4 HEARING OFFICER HALLORAN: Yes,
5 there is.

6 MS. NIJMAN: Okay. So am I speaking
7 then to the witness or you?

8 HEARING OFFICER HALLORAN: To me,
9 the record, the board, the witness maybe and
10 Mr. Abel --

11 MS. NIJMAN: And the objection is?

12 HEARING OFFICER HALLORAN: I mean,
13 Mr. Russ. I'm sorry.

14 MS. NIJMAN: And the objection is?

15 HEARING OFFICER HALLORAN: He -- he
16 mentioned he didn't know what it was. I guess,
17 you know, foundation, I don't know, authenticity.
18 Just explain what the heck you did.

19 MS. NIJMAN: Okay. And I'm trying
20 to do that.

21 BY MS. NIJMAN:

22 Q. So let's go back to the first ones.
23 That's the graph that is presented in your
24 demonstratives, correct, Mr. Kunkel?

1 A. Yes.

2 Q. So here it is. Is that it in your
3 demonstratives? It's identical. See, identical.

4 A. No, I don't doubt because you had
5 the spreadsheets.

6 Q. Yeah.

7 A. Absolutely.

8 Q. So what I've done is simply increase
9 it on the same level and I can provide you a copy
10 to see closer.

11 MR. RUSS: Can I look at the screen?

12 HEARING OFFICER HALLORAN: Yes, you
13 may stand up, Mr. Russ, and look at the screen.

14 MS. GALE: Abel, I have a copy, too,
15 if you'd like. Mr. Hearing Officer, would you
16 like one?

17 HEARING OFFICER HALLORAN: Sure.

18 Thank you.

19 MR. RUSS: I'm sorry. I just have
20 to look. I want to make sure these are the same.
21 Okay. I get it. I get it. Thank you for
22 explaining.

23 MS. NIJMAN: You're welcome.

24 MR. RUSS: Withdraw my objection.

1 HEARING OFFICER HALLORAN: Thank
2 you, Mr. Russ. You may proceed.

3 BY MS. NIJMAN:

4 Q. So turning to the next slide, still
5 for boron, you told me it was decreasing, you
6 compared it to background, you compared it to the
7 Class 1 standard, it's way up here, it's off the
8 scale.

9 Turning to the next one for
10 boron MW-3 you told me there was a slight
11 increase. Again, looking at the Class 1 standard
12 way up off the scale.

13 Looking at MW-4, you told me
14 there it was going to be a slight decrease.

15 MR. RUSS: I have another objection.
16 Sorry to do this. She is narrating. It's not a
17 question.

18 HEARING OFFICER HALLORAN: Yeah,
19 let's make it in the form of questions,
20 Ms. Nijman.

21 MS. NIJMAN: Sure.

22 HEARING OFFICER HALLORAN: Thank
23 you.

24 MS. NIJMAN: I was trying to move it

1 faster at the late hour, but I'm happy to do it
2 one at a time.

3 BY MS. NIJMAN:

4 Q. Let's go to MW-4. So, Dr. Kunkel,
5 you see that this is your graph as you proposed
6 it, correct?

7 A. Yes.

8 Q. And you see that as we discussed the
9 Class 1 standard for boron is way up here at the
10 top of the graph, correct?

11 A. Correct.

12 Q. So none of these standards for
13 Joliet are above the Class 1 standard, correct?

14 A. Correct.

15 Q. Let's go to the next one. MW-5 you
16 said yesterday not increasing or decreasing. You
17 have your background down here I think at 0.18.
18 None of these are above the Class 1 standard,
19 correct? Next one.

20 THE COURT REPORTER: Was there an
21 answer? Was there an answer?

22 BY THE WITNESS:

23 A. Correct. Yeah, I don't
24 particularly -- do I have to answer correct and

1 yes? I mean, I agree.

2 HEARING OFFICER HALLORAN: You have
3 to say yes or correct just for the transcript.

4 THE WITNESS: Okay. I do.

5 BY MS. NIJMAN:

6 Q. I tried, Dr. Kunkel. I tried to do
7 them all at once.

8 A. Well, we went through these
9 yesterday and I think you agree with what I'm
10 saying there and I did explicitly say that --

11 Q. I'm sorry. There is not a --

12 A. At Joliet --

13 Q. -- question pending.

14 HEARING OFFICER HALLORAN: I'm
15 sorry. One person at a time.

16 MS. NIJMAN: There is not a question
17 pending.

18 HEARING OFFICER HALLORAN: Doctor,
19 wait until a question is pending.

20 BY MS. NIJMAN:

21 Q. MW-6 you told me generally
22 decreasing and the standard -- everything is below
23 the Class 1 standard, correct?

24 A. Correct.

1 Q. MW-7, same, everything is below the
2 Class 1 standard, correct?

3 A. Right.

4 Q. This one I think you skipped
5 yesterday. It looks -- well, how would you
6 describe this? Flat?

7 A. I didn't mean to skip MW-8, but I
8 think we went through that on one of the tables
9 where we looked at boron and sulfate and they were
10 either below or right at the --

11 Q. Background?

12 A. -- background, yes.

13 Q. The background you've applied?

14 A. Yes.

15 Q. But way below the Class 1 standard?

16 A. Clearly.

17 Q. MW-9 same, correct --

18 A. Correct.

19 Q. -- below the Class 1? Number 10,
20 same, correct? Yes?

21 A. These are just for boron, correct?

22 Q. Yes, right now --

23 A. Okay.

24 Q. -- we're just on boron. MW-11 you

1 said not increasing or decreasing. A historic
2 flip this one right at the standard, all below the
3 standard in the last few quarters, correct?

4 A. Correct.

5 Q. This one was not described because
6 you had periodic data, is that --

7 A. Well, MW-1 is the same for boron as
8 it is for sulfate in terms of the detection limit
9 or the detects or the sampling samples --

10 Q. Right.

11 A. -- number of samples. It should be
12 the same.

13 Q. You didn't give a description as to
14 increasing, decreasing, flat?

15 A. I couldn't, no.

16 Q. That's what I meant.

17 A. Yes.

18 Q. Thank you. All above -- all below
19 the Class 1 standard, correct --

20 A. Correct.

21 Q. -- for sulfate now we're looking at?
22 MW-2, same, looking at the standard for sulfate at
23 400 we're seeing everything way below Class 1
24 standard, correct?

1 A. Correct.

2 Q. MW-3 you told me it was decreasing.

3 Everything is way below Class 1 standard, correct?

4 MR. RUSS: Can I just object to way?

5 The word way. Vague.

6 HEARING OFFICER HALLORAN:

7 Sustained.

8 BY MS. NIJMAN:

9 Q. MW-4 you told me it was decreasing.

10 Actually, I shouldn't say you told me. You

11 testified. You were telling your counsel.

12 A. I did.

13 Q. You said it was decreasing and again
14 below the sulfate standard of 400, correct?

15 A. Correct.

16 Q. MW-5 you said was not increasing or
17 decreasing based on your eyeball view of it, but
18 again below the sulfate level Class 1 standard for
19 Illinois, correct?

20 A. Correct.

21 Q. MW-6 for sulfate, not increasing or
22 decreasing below the Class 1 standard, correct?

23 A. Correct.

24 Q. MW-7 not increasing or decreasing,

1 but, again, below 400 the Class 1 standard,
2 correct?

3 A. Correct.

4 Q. MW-8 you said it's basically at
5 background below Class 1 standard for sulfate with
6 a couple blips, but you said at background?

7 A. Correct.

8 Q. MW-9 I think was so low so the
9 standard of 400 for sulfate you start your graph
10 at 0 to 2000 so I can't even see 400. It's way
11 down here. And you didn't describe for MW-9
12 sulfate. So --

13 MR. RUSS: Can I object to that,
14 too? I think he did describe it. He might not
15 have said the words you have been using on the
16 other wells.

17 HEARING OFFICER HALLORAN: If he can
18 answer, he is able because I don't remember. I'd
19 be lying if I said I did.

20 BY THE WITNESS:

21 A. You know, I don't remember whether I
22 described it or not, but clearly many of the data
23 points are either at or above the Illinois Class 1
24 groundwater standard of 400 milligrams per liter

1 of sulfate.

2 BY MS. NIJMAN:

3 Q. At one well MW-9?

4 A. One well.

5 Q. Did you ever see it anywhere else at
6 Joliet?

7 A. Well, there is a possibility that --
8 that 10 and 11 tend to be fairly high as well.

9 Q. Let's look at MW-10 for sulfate.
10 Again, you told me it was decreasing and sulfate
11 standard is 400 milligrams per liter and we're
12 below the Class 1 standard, correct?

13 A. Correct.

14 Q. And 11 you mentioned -- let's go to
15 11. You told me -- you testified it was not
16 increasing or decreasing. Your background level
17 is down here at 50, the Class 1 standard at 400
18 and they're all below the Class 1 standard,
19 correct?

20 A. Correct.

21 Q. So when I total these up for boron,
22 you got 11 total graphs, six of the 11 are
23 decreasing, three of the 11 you said flat and only
24 one you said was increasing, correct?

1 A. For boron.

2 Q. And for sulfate you said there is
3 one at background, one not described, four that
4 are flat, three that are decreasing, does that
5 sound right?

6 A. Yes.

7 MS. NIJMAN: Mr. Hearing Officer,
8 without getting into a whole new area --

9 HEARING OFFICER HALLORAN: I think
10 it's a good time to get off the record for a
11 second. We can talk. Thanks.

12 (Whereupon, a break was taken
13 after which the following
14 proceedings were had.)

15 HEARING OFFICER HALLORAN: We're
16 back on the record. So it's approximately 3:55 on
17 October 27th, 2017. This hearing will be
18 continued. We haven't set a date yet. It will be
19 hopefully sometime in January 2018. I have a
20 conflict until then. We've decided to have a
21 status conference on this matter November 14th at
22 11:30 a.m. We're on -- I'm thinking the first day
23 of hearing October 23rd will be available online
24 November 1st. Did I forget anything? That's it.

1 This is sad to see you one last day before the new
2 year, but, anyway, thank you so much. It's been
3 fun, it's been professional, it's been civil and
4 it's been a long week and thank you so much.

5 MR. BUGEL: Thank you.

6 MS. GALE: Thank you, sir.

7 MS. NIJMAN: Thank you for your
8 attention.

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

1 STATE OF ILLINOIS)
2) SS.
3 COUNTY OF COOK)
4

5 I, Steven Brickey, Certified Shorthand
6 Reporter, do hereby certify that I reported in
7 shorthand the proceedings had at the trial
8 aforesaid, and that the foregoing is a true,
9 complete and correct transcript of the proceedings
10 of said trial as appears from my stenographic
11 notes so taken and transcribed under my personal
12 direction.

13 Witness my official signature in and for
14 Cook County, Illinois, on this _____ day of
15 _____, A.D., 2017.

16
17
18
19
20
21
22
23
24

STEVEN BRICKEY, CSR
8 West Monroe Street
Suite 2007
Chicago, Illinois 60603
Phone: (312) 419-9292
CSR No. 084-004675

A	173:24 191:9	109:11	34:18,20	142:13
A-N-I-S-O-T-...	243:15	agree 31:20	anisotropy 34:2	applicable 79:19
34:14	action 51:23	79:17 83:23	34:9,10	application
A.D 256:15	215:5	96:24 125:9	annually 237:14	100:3
a.m 1:16 5:10	actions 51:19	149:11 173:2	answer 76:1	applied 207:4
254:22	active 54:9 55:4	173:23 177:6	95:21 102:7	208:4 249:13
AA 17:7	55:7,10,12,21	177:10,17	118:16,19	apply 24:4 83:20
abandoned	56:1,20 192:5	178:5,10,16,20	124:7,12	190:14 191:23
38:17 39:4,8	194:16 195:19	181:4,14 182:3	133:23 134:9	235:1,7
Abel 2:10 21:24	actual 57:13,20	194:19 195:6	142:22 152:16	appreciate
24:17 66:11	57:22 78:2	214:19 215:14	152:18 157:2	134:9 182:21
244:10 245:14	123:21 217:5	232:18,20	160:5 176:14	appreciates
able 56:5 118:19	added 139:3,8,9	248:1,9	179:23 181:17	65:24
133:23 152:17	139:14 142:13	agreed 63:11	182:21 183:1	approved 18:15
157:2 202:6	149:18	ahead 179:24	188:8,12 194:1	66:23 68:12
252:18	adding 74:11	204:1	202:6 226:24	198:5
above-entitled	221:13,14	alleged 236:20	228:16 247:21	approximate
1:12	additional 7:12	allow 70:22	247:21,24	228:23
Abscissas	61:22 63:23	133:6	252:18	approximately
242:10	136:5,9,14,17	allowed 19:20	answered 79:6	5:10 71:17
absence 192:6	139:11,15	69:15	125:8 133:21	153:7 254:16
Absolutely	148:7 167:21	alluded 122:23	146:5 181:22	aquifer 46:11
76:19 174:4,4	196:1	alluvial 29:4	182:23,23	area 12:3,13,19
245:7	additions 139:3	Aluminum	197:20	12:20,23 13:22
abstract 53:2	address 174:1	184:21	answering	25:23 29:18
77:20 78:15,19	adjacent 10:16	amend 163:16	144:24	32:3 33:24
79:16	33:24	amended 221:9	answers 158:21	72:7,10,12,17
abstracts 69:17	admissibility	221:10,21,21	anymore 224:18	199:21 200:21
77:15,22 79:3	53:20	amount 99:20	anyway 178:1	200:24 201:3
79:24 81:1	admissible 70:8	169:13 171:13	242:6 255:2	202:11,21
accept 65:9	70:11,14	172:20	apologies 15:24	204:22 205:4
169:3 191:24	admit 222:17,19	analogous	apologize	212:8,13 214:1
acceptable 8:8	admitted 59:17	195:14	143:10 160:9	215:4,6,7,10
61:24 134:17	59:20 60:5	analyses 61:6	169:17	217:24 218:2,4
163:24 166:2	66:4 69:1	85:10	Apparently	228:7 254:8
166:13 168:12	222:15 223:14	analysis 13:4	20:12 140:9	areas 189:18
187:20	adopted 197:2	63:11,11 65:4	appear 80:15,22	190:15 192:13
acceptance 84:3	adopting 197:6	83:15,19,24	139:18 158:21	201:6,8,21,22
accepted 69:19	197:12	171:20,24	226:3	202:18 212:10
186:11	affirmation	172:2,2 215:1	Appeared 2:18	argument 19:5
access 216:23	165:13	232:16 241:11	3:1	70:10
account 234:7	aforesaid 256:8	analytical 61:9	appears 30:7	arrows 12:5
accuracy 145:6	afraid 120:20	171:12	34:1,3 98:15	arsenic 211:23
accurate 17:17	198:12	analyzed 96:10	106:16 147:19	215:3
53:6 90:17	afternoon 211:1	and/or 32:4	256:10	article 170:1,5
145:16 155:14	agency 192:2,8	215:5	appendices	170:24 171:1,6
	ago 5:18 95:17	anisotropic	141:15,19	171:16,19

artificially 25:8	171:14 172:12	149:22 154:3	79:19 178:14	216:14 217:1,2
aruss@enviro... 2:13	173:8 175:6,8	163:18,19	ASTM's 56:24	217:3 227:12
as-built 68:4,10	176:11 177:10	180:20 186:18	attached 140:3	227:14 234:22
89:15,21 90:9	178:11 182:10	186:24 197:13	149:5 151:22	
101:1,9,16,22	182:19 185:6	199:1 201:18	159:18 161:8	B
102:9	189:2,18 190:4	203:3 226:18	attachment	B 4:8 219:23
as-built s 89:24	190:11,15	asks 151:12	36:19 158:19	B1 219:22 225:2
90:16 100:24	191:4,8 192:12	assertion 159:16	attempting	225:4 226:9
ash 9:17 12:16	192:15,16	assess 58:23	201:17	B14 224:19,20
12:19,20,23	193:10 198:1	88:20 171:12	attended 221:3	225:7,22,23
13:1,21 14:4,8	200:11 201:6	174:12	attention 194:12	226:5,8
14:11,12,18	201:21,21	assessment	255:8	B15 228:16
16:14 22:20	202:9,10,21	10:18 32:4	attest 172:14	B4 219:23
24:4,8,9 25:1,9	204:21 205:18	43:14 185:1	attorney 95:15	back 6:11 12:13
25:10,13 26:1	205:21 210:19	187:24 200:7	97:22 127:17	13:7 14:16
26:4,5,5,21	211:20 212:4,8	224:8 228:20	127:18 128:13	20:6 27:22
30:3 38:16	212:13 213:10	assigned 5:4	attorneys	33:19,23 49:21
39:2,3,12 40:9	213:16,17	assisted 84:11	148:11 154:7,8	55:5 59:11
40:11,21 42:11	214:1 215:4,6	84:21	authentic 53:15	69:4 71:12,17
43:3 44:15,18	215:10 218:24	assisting 154:7	authenticity	89:16 102:23
45:6,10,22,23	219:10,14	associated 64:6	244:17	103:5 121:1
46:11 47:1	225:1,6,8,9,11	192:2 194:14	available 50:17	149:12 152:24
48:12 50:20,23	225:12,13	194:16 195:19	126:16 175:5	153:6,6 154:4
51:3,5,23 52:9	228:12 229:7	196:15	178:17 254:23	161:19 165:16
57:6 58:11	230:22,23	associates 85:23	Avenue 2:11	174:17,20
66:24 67:2	231:2,9,10,13	assume 30:9	average 112:22	183:20 194:7
72:7,9 74:5	231:16 232:22	117:1 122:5	112:23 113:6	199:8 221:2
77:5 87:3,3,5	232:24	128:2 129:10	113:12 114:15	222:19 223:3
88:5,13,16,22	ash-like 72:17	132:3,10 133:1	114:18,19	229:2,20
91:1 99:10,20	aside 16:24 21:6	134:21 166:21	117:6 118:8,22	244:22 254:16
100:3 101:9	47:12 128:12	178:9 224:14	119:1,13,17,18	background
102:10,14	asked 79:5	227:3,9	119:19 120:6	13:12 31:15
106:19 107:23	93:24 97:22	assumed 133:17	120:15,15,16	36:7,14,17,22
108:14 115:16	125:7 129:1	assuming	121:19	36:23 37:4,5,7
115:17 116:9	133:20 138:11	126:11 130:17	aware 44:22	37:9,24 38:4
117:2 118:9,10	141:16 142:4	131:7,15 135:1	45:1 76:17,20	39:5,7,17
118:13,14,15	148:6,7,15	assumption	77:4,7,8,9	40:13,17 41:5
127:5,21,22,24	155:15 157:24	123:8,11 129:9	163:19,24	41:11 42:1,3
128:4,5,5,12	159:16 163:7	129:9 130:11	164:2 165:10	42:14,17 48:5
128:23 129:18	174:18 175:2	130:13,15,23	185:4,10,14,16	51:1 57:19
131:24 134:14	175:12 179:10	131:2,18	187:22 188:3	75:9,11,15,17
134:17 151:17	181:22 182:22	133:11 152:12	188:14,15	75:18,20,21
151:18,22	197:18 213:7	196:5,7	189:8,11	76:2 82:10
154:18 156:14	asking 53:7,8	assurance 86:8	190:10 192:2	207:3 208:3
159:18 161:1,4	79:14 120:4,5	ASTM 52:10,11	193:12,15,21	241:15 246:6
161:9 164:9	127:18 128:20	54:3,4 55:10	196:13,14	247:17 249:11
	134:18 143:18	57:4,10 77:11	198:4 215:9	249:12,13

252:5,6 253:16 254:3 backhoe 134:15 backwards 93:2 bad 6:17,20 134:7 bag 40:16 band 35:24 bank 123:19 banks 33:19,24 barge 29:14 base 53:17 77:14 107:4 based 9:13 11:23 20:18 21:12 36:19 44:13,18 51:16 53:2 72:12 74:21 79:2,10 81:1,3 82:20 83:10 120:6,22 125:17,21 129:8 132:12 140:15 149:7 169:13,15 178:13,14 184:24 187:24 217:4,5 230:7 234:1 235:12 237:9,11 243:21 251:17 basic 29:1 basically 29:4 178:1 252:4 basin 99:11,16 100:3 101:10 102:14 105:23 106:19 107:23 108:14,16 115:16,17,17 116:9 117:2 118:9,10,10,14 118:15,15 178:3 204:21 205:18,21 210:19 basing 124:21	basins 115:13,22 basis 57:15 65:14 94:1 120:20 131:6 132:3,10 133:1 134:19 140:18 149:20 158:1 160:5 170:8 193:2,4 Bates 6:24 7:3,9 7:10,12 17:1 22:7,11 24:16 43:11 45:16 95:3 100:6,9 102:13,16 103:6 105:15 106:13 139:9 139:16,24 140:3 141:15 141:17,17,21 141:23 142:10 142:13,14,19 143:2,2,4,9,13 143:15 147:15 147:15 149:3 149:14,15,16 149:17 150:12 150:24 151:24 160:4 161:18 164:14 175:19 204:7 206:18 207:21 208:18 209:11 210:3 214:15 bed 199:24 bedrock 36:15 36:17 45:13 46:3,11,16,19 46:23 48:6 begins 64:18 191:22 199:13 behalf 2:18 3:1 behave 51:15 225:14,16 believe 10:19 12:16,18,23 15:15 18:3	25:16,18 27:12 65:3 69:7 74:20 80:17 82:18 96:11 101:15 109:13 110:10,13 111:5 132:17 147:3 155:22 161:15 164:20 173:18 177:2,5 181:9 182:13 183:19 186:2 190:6 192:21 192:23 196:18 198:11 201:20 205:14 211:9 217:7,14,19 223:9 227:21 227:22 228:1 234:1,17,23 240:2,12 believed 82:14 belong 78:3,4 benchmarks 215:4 beneath 9:12 44:20 76:18 108:13 109:12 beneficial 200:5 berm 73:8 berms 24:10 73:2,3,4,5,6,12 190:2,5 202:14 202:15 best 25:14 57:19 80:23 146:5 169:18 226:8 better 83:24 84:3 bi- 118:13 bid 104:20 big 120:17 124:12 bigger 225:11 binder 7:22 16:22,23 33:1 35:10 48:24	52:19 54:13 60:11 81:18 138:3 140:12 184:14 186:2,3 191:19 222:20 223:3,9 binders 11:15 11:19 bit 12:2 29:3 64:4 129:14 184:3 220:16 229:17 243:24 black 46:1 54:7 blips 252:6 block 104:22 232:5 blowing 18:23 blue 13:18,24 35:24 88:6 118:1 board 1:1 5:4 60:1 65:24 126:3 242:7 244:9 Boiler 211:10,19 213:19 215:16 215:20,24 217:22 borderline 39:24 bore 25:4 224:7 224:11,16,20 224:22,24 225:4,5,10 227:5 228:4 boring 25:15 45:19 219:17 219:18,20 227:5,18 228:16 229:9 229:14 borings 10:16 10:17 13:2 228:7 boron 9:18,21 9:23 10:10,12 10:14 11:4	13:9,10,14 25:19 26:6 27:14 28:12,13 36:6,10,14 37:3,10,13,20 37:21 38:13 39:1,14,14,19 39:20,21 40:12 40:14 41:4 42:1,13,13 44:23 45:2,9 47:13 48:6 75:7 182:9 185:21 187:5 187:15,16,16 187:17 206:18 206:22 207:22 207:23 208:20 209:12,13 210:4,5 219:7 225:18 229:4 233:18 243:5 246:5,10 247:9 249:9,21,24 250:7 253:21 254:1 bottom 16:13,18 17:15 21:8,15 24:5 33:10 36:1 43:8,9,19 44:11 65:1 67:1,5,9,22,24 100:22 106:6 112:2,21 114:5 114:12,14 115:23 116:8,9 117:2,11 118:7 118:23 119:20 120:7 125:17 125:23,23 127:24 128:4 128:12 129:15 134:16 199:12 bottoms 17:10 23:11 29:7 43:5 44:15,17 46:21,23
--	---	--	---	---

127:23	canal 29:14 32:1	CCR 120:4	110:14 111:18	cite 141:24
Brad 5:2	32:7,10,13,23	137:4 184:10	change 42:6	186:19
BRADLEY 1:13	capped 195:21	184:13 186:15	51:20 70:21	cited 140:23
break 49:17	capping 195:10	187:1,1,2,22	105:3,7 241:19	141:3,10 142:4
59:7 71:7,13	captioned 5:5	189:6,9,13	changed 8:3,4	149:3
152:22 153:2	career 86:24	190:10,12,14	90:13 104:14	cites 150:24
211:2 220:17	careful 242:13	191:23,24	changes 27:11	175:17
220:21,22	careless 133:4	192:3,5,5,22	32:13 33:19,21	Citizens 1:5 5:6
223:20 254:12	carries 29:14	193:13 194:11	33:22 34:6	153:11
Brickey 3:4	case 36:15 37:8	194:14,16	61:8 64:8	civil 255:3
256:5,20	37:23 39:24	195:9,14 196:3	104:10 105:10	claim 58:8 171:2
brief 58:22	60:24 64:5	196:4,9,15,21	139:17	claimed 52:7
briefly 5:22 52:5	88:9,20,22	197:2,5,12	characteristics	196:17
bring 128:3	89:6,9,15,16	198:2 199:8,13	37:20	claims 156:1
157:1	89:17,18,21	199:15,20,21	charged 181:7	197:1
broad 144:6	90:21,23 91:2	200:2,3,3,5,22	charts 38:5,6	clarify 9:8 15:14
brought 232:6	91:5,10,12,20	200:24 201:2,2	84:16,16	55:14 57:24
brown 45:23	91:23,24,24	201:4,4,24	119:10 243:14	59:12 72:1
bubbles 103:16	92:4,8 93:7	202:17 231:1	check 43:2	79:1 80:10,13
Bugel 2:2 19:12	94:5,20 95:4	239:24	149:3 239:18	111:15 125:5
20:3,4 69:9	95:15 99:5	center 1:4,15 2:5	chemical 177:10	126:6 135:23
70:6,18 221:12	126:23 127:1,8	5:6 67:7 89:3	chemistry	191:2
221:15,23	129:2 130:18	certain 126:16	177:11	Class 27:5 28:6
255:5	131:19,19	154:3 181:8	Chicago 1:15	28:10,11,16
built 68:13 90:6	133:12,18	227:2,9	2:7,22 256:22	37:15 38:1
104:14 193:10	135:24 136:23	certainly 11:22	chose 182:8	39:18,22 40:7
bullet 57:16	137:21,23	29:2 76:11	186:10	40:18 41:6,12
127:20 128:15	138:3 151:1	79:17 88:3	Chris 177:24	41:15 42:1,15
156:9 157:5	161:16 178:23	118:24 145:4	Christopher	48:4,7,9 75:11
bullets 82:12	198:13 214:5	certification	162:18	206:23 207:7
bunch 140:19	cases 37:4 79:19	158:15 159:15	chronologically	207:10,17,23
burning 178:1	86:24 172:24	161:13 165:24	137:9	208:6,9,15,20
bypass 115:16	185:2 192:2	166:10 174:18	cinders 25:9,10	209:1,8,14,18
116:9 118:9,14	196:11,15,16	174:20 175:16	25:11 46:1	210:1,6,10,14
	243:2	certified 163:13	citation 140:7	210:20 230:11
C	catch 10:4	163:22,23	141:20 144:5	232:13 234:6
C 2:1 9:2 71:22	cause 1:12	166:5,13	148:24 149:1,4	234:24 235:11
216:8	128:18	168:11 170:14	149:15 154:21	235:18 236:21
calculated 65:13	caused 62:17	256:5	156:3 160:10	237:10,20
65:14	97:7,11 132:16	certify 256:6	175:3	239:20 242:21
California 2:16	causes 129:2	certifying	citations 138:16	243:7,20 246:7
call 240:15	130:18	170:15	138:18 139:15	246:11 247:9
called 8:21	causing 97:4	cetera 28:17	140:17 141:22	247:13,18
89:17 103:7	130:22 202:22	61:19,20	145:17 147:5	248:23 249:2
137:19 170:7	cave 200:1	CFS 122:4,4	148:4 149:12	249:15,19
224:13,20	caveats 57:1	chair 132:15	159:11 167:22	250:19,23
calling 217:22	CCA 87:21,24	chance 35:17	187:11	251:3,18,22

252:1,5,23 253:12,17,18 clay 45:23,24 46:2 96:12 clean 5:17 cleaned 5:22 cleaning 115:17 118:9,15 cleanup 215:7 clear 7:9 27:18 31:9 52:16 69:4 70:14 72:2 113:1 128:1 135:20 179:12 181:1 185:18 clearer 111:16 clearly 21:9 26:13 39:21 43:18 50:20 68:11 111:11 146:1,13 202:10,20 249:16 252:22 click 54:8 55:18 55:21 clicked 55:4 56:15 clicking 55:19 55:20 client 86:7 clip 204:3 close 46:22 67:20 110:9 162:9 175:10 215:6 225:23 226:2,12,13,14 227:18,22 228:1,2 closed 195:21 closer 28:20 245:10 cloud 103:19,24 104:1,5,8 clouds 103:17 Club 1:3 2:14 5:5 89:3,8	co-counsel 5:16 coal 9:17 10:15 12:16 13:1 24:4,8 25:1,9 25:11,12 26:1 26:21 45:6,10 45:23 46:1,1 46:10 47:1 48:12 50:20,23 51:3 57:6 74:5 87:3,3,5 88:4 88:22 119:23 119:24 151:17 154:18 160:24 171:14 177:10 177:11,18,22 177:22 178:2,3 178:11 182:10 182:19 185:6 189:2 192:15 199:24 211:20 213:9 218:24 219:10,14 225:8,10,18 229:7 230:21 230:23 231:2,9 231:10,13,16 232:19,22,24 coarse 25:11 collect 71:7,7 collected 35:5 74:23 collecting 106:9 collection 107:8 Colstrip 89:15 89:18 93:7 95:4 97:18 98:3 99:5 126:23 127:8 213:1 column 184:19 191:21 194:10 194:10 199:13 columns 236:2,3 combined 27:3 28:4 239:11 combustion	177:12 178:5 come 14:16 152:24 162:9 194:7 232:21 232:24 239:17 comes 233:8 coming 10:13,14 25:20,22 26:1 31:2 116:13 156:20 157:6 157:22 211:18 comments 128:17 common 57:7 commonly 61:4 64:16 Commonwealth 72:19 Comp 139:24 147:10 148:10 228:20 companies 156:17 157:11 companion 224:6,11 company 89:12 213:9 compare 120:4 compared 36:6 36:14,24 78:14 241:14 246:6,6 comparing 65:13 143:13 complainants 1:6 2:18 5:7 48:19 58:16 60:6 68:20 148:12 154:8 155:7 203:13 222:8 Complainants' 5:23 6:24 7:4 60:4 66:3 69:2 70:22 74:14 95:3 203:8 204:12 222:15 223:12	complete 192:18 256:9 completed 26:3 29:8 195:10 206:4 219:10 219:14 229:6 completely 30:24 31:21 88:9 179:19 217:20 completing 124:7 complex 92:12 complicated 61:6 component 215:15 composition 177:10 compound 118:17 202:4 concentrated 96:3 concentration 28:9 37:6 39:6 40:6 48:7 207:23 208:14 208:24 209:7 209:13,17,24 210:5,9 242:16 concentrations 9:19,21,24 13:9,10 25:19 25:24 26:7 27:5 28:6,13 28:15 36:6,10 36:14,17 37:2 37:3,11,14,21 38:3,13,14 39:13,14,16,20 40:11,16 41:3 41:8,10,19,24 42:3,14 47:19 50:24 51:9,19 57:20 58:10 82:14 154:16 182:16,19	210:20 219:7 229:4 231:18 242:1 concept 87:21 concern 70:7 170:9,12 176:18 184:24 187:24 concerned 162:13 167:5,6 168:3 201:7,23 concerning 49:11 189:9 concerns 83:18 conclude 13:17 concluded 101:5 concluding 65:15 conclusion 26:20 84:5 203:3 conclusions 9:9 9:11 10:20 61:1 213:22 concrete 149:5 151:23 159:19 161:9 condition 97:10 conditions 57:10 57:18,23 61:13 156:18 157:12 188:17,21,23 205:22 conducted 185:1 188:1 conducting 172:6 conductivity 34:21,23 conference 254:21 confirm 239:24 confirmed 181:11 215:2 conflict 254:20 confused 98:16 137:6 142:4
--	--	--	---	---

160:13 201:24 224:23 confusing 21:4 187:8 confusion 73:16 connect 161:17 conservation 123:6 conservative 131:1 171:10 consider 31:15 126:8,9 171:18 192:12,18 considered 202:21 considers 195:13 consistent 48:11 51:10,13,16 69:24 70:20 192:7 231:13 consistently 85:10 208:16 constituent 235:17 constituents 28:9 74:5 154:18 156:20 176:17 184:1 184:24 186:21 212:1 225:11 230:18 231:12 236:10 241:14 constructed 29:21,23 46:18 90:19,20 115:18 construction 12:21 16:11 18:16 45:12 66:23 68:12 90:2,10,12 91:5 96:4 100:19,21 101:18,24 102:13 104:13 104:17,20,24	107:22 164:8 165:6,13 169:4 169:8 170:11 172:15 173:22 174:3,11 175:9 176:11 192:16 198:10,18,19 200:12 consultants 163:21 consulting 78:4 86:2,6 contain 145:16 235:3 contained 136:22 190:20 215:3 contains 25:9 227:3 contaminant 184:23 231:16 contaminants 11:3 13:18,20 57:9 157:22 211:18 contaminated 9:15,16,17 45:6 51:3 contaminating 12:17 58:8 contamination 9:14 12:24 15:10,11 26:11 26:14,22 40:20 42:19 46:11 47:2,6,7 48:12 50:10,10,19,24 51:21 52:8 74:10 75:17,18 148:23 149:2 150:2 151:13 156:2 180:4,10 182:20 202:23 211:11,12,21 217:6 context 102:21 continue 19:20	23:19 51:21 102:5 129:13 continued 5:11 47:9 175:8 254:18 continues 52:3 contour 14:2 204:16,18 206:1 contours 11:23 205:13 contractor 131:24 135:16 193:9 contractors 134:2,22 contributing 45:2 211:11 control 1:1 5:4 29:16 216:9,10 controlled 121:7 controls 121:10 convert 67:16 Cook 256:3,14 cooling 11:7 copied 127:14 232:6 copies 27:15 102:19 222:1 232:7 copper 184:21 copy 18:2 110:3 164:22 222:3 245:9,14 core 111:4 corner 30:2 38:10 40:8 106:6 Corps 121:8 122:13 correct 7:7 55:11 69:21,23 70:20 72:10,13 72:14,16,19 73:12,20,21,23 73:24 74:2,7 74:19,22 75:9	75:19 76:2,10 77:6,15,20 78:19,20 79:4 80:16,19 83:11 83:21 84:1 85:13,17 86:3 86:8,13,16,17 86:19,24 87:9 87:10,19,22,23 88:10,11,13,14 88:17,18,20,21 89:18,19,24 90:10,11,13,14 90:18,23,24 91:3,6,10,20 92:2,9,20 94:5 94:21 98:23,24 99:3,6,17,20 100:20 101:6 101:10 103:13 103:14 104:15 104:16,18,24 105:5,9,11,23 106:2,7,10,11 106:15,16 107:1,5,6,9,13 107:14,16,17 107:20,21,24 108:1,3,4,7,9 108:18,19,22 108:23 109:4,5 109:12,13,19 109:21 112:6,9 112:12,15 113:13 114:17 114:20 115:23 115:24 116:2,3 116:6,7 117:21 118:9 119:5 121:11,16 124:14,15 125:6,16 126:11 127:3 130:3,7 131:21 132:18,22 136:2,7,15,19 136:20 137:12	137:23,24 140:5,6 141:7 141:9,12,21,24 142:7,15,16,20 143:7,12,16,20 145:20 146:15 146:20,21 148:4,5,20,24 149:3,9,19 150:5,9,10 152:5,7,9,12 155:5,6,17,18 155:21 156:7 159:1,7,12,24 160:8 161:22 162:2 165:14 166:1,11,18,20 167:18 168:5 171:7,16 172:19 175:23 176:1,12,14,21 177:3 180:8 181:9,16 182:5 182:7,10,14 183:4,5,7 186:10,15 188:17 189:19 190:2,6,15 196:7,9,21 197:4,7,23 198:2,7,10,18 199:16 200:8 204:19 205:4 206:2,13,23,24 207:4,5,10,11 207:13,14,18 207:19,24 208:1,4,5,9,10 208:13,16,17 208:21,22 209:1,2,4,5,8,9 209:14,18,21 209:22 210:1,2 210:6,7,11,12 210:14,15,21 210:22 211:10 211:12 212:6
--	--	---	--	--

213:23 215:17	139:24 147:13	104:6 105:8	77:23 84:14	decided 192:8
215:18,21,22	155:6 180:20	106:14,14,20	85:7,9,11,12	196:13 254:20
216:1,19,20,23	196:19 251:11	106:23 107:7	114:21,24	decision 69:16
217:13,18,22	count 28:8	107:19 111:23	115:2,6 119:11	decisions 232:9
217:23 218:2,6	counted 234:4	153:8 206:9	120:12,15,19	decrease 246:14
219:14 220:1	235:16 236:6,8	Cross-Examin...	120:23 122:3,3	decreased 39:3
229:1,14,15	236:12	4:5	122:7,20	41:20
230:3,5,6,8,9	counting 237:2	cross-examine	123:21 124:23	decreasing 42:4
231:2,3,10,11	237:19	53:1	125:21 126:9	82:15 83:8
232:4,6 234:8	County 28:19	crushed 112:15	136:6,6,10,14	241:5 243:8
234:12,13	29:2,6,21	CSR 3:4,4	136:18 178:17	246:5 247:16
235:13,19	30:14 31:10,10	256:20,23	230:8,10 232:6	248:22 250:1
236:16 237:10	33:11 35:3,11	curious 241:18	235:15 237:20	250:14 251:2,9
237:11,17	36:5 43:4,15	current 21:7	238:15,23	251:13,17,22
238:1,2,16,20	44:17 45:6	currently 76:11	239:2,6,7,17	251:24 253:10
240:1 241:5,11	47:12 48:2	156:14	239:18,19,21	253:16,23
241:12,15,16	51:7 74:13	curve 123:15	239:24 250:6	254:4
241:20,21,23	76:5 175:5	cushion 112:3,9	252:22	deep 25:6
242:22 244:24	234:18 239:5	112:9 116:4,5	database 232:17	defects 91:5
247:6,10,11,13	256:3,14	CV 85:16 88:5	date 16:4 54:10	172:15 174:14
247:14,19,23	couple 5:18	cycles 61:11,12	73:17 91:16	defendants
247:24 248:3	28:22 29:10	64:7	139:22 153:18	56:22
248:23,24	126:22 138:16		192:1 254:18	define 186:14
249:2,17,18,20	143:8 231:4	D	dated 30:10 49:5	194:3 196:23
249:21 250:3,4	238:5 252:6	D 4:1 9:2	60:16,23	defines 75:18
250:19,20,24	coupled 123:17	D.C 2:12	137:11 138:6	104:8 193:24
251:1,3,14,15	course 93:20	damage 127:20	139:22 147:10	194:2 196:21
251:19,20,22	194:22 226:14	128:6 129:4	147:12 148:12	defining 75:8
251:23 252:2,3	Court 1:14	130:18 185:2	176:1 185:24	193:13
252:7 253:12	41:15 73:9	192:2 196:11	214:15 218:9	definition 34:15
253:13,19,20	102:6 118:13	196:14,16,17	dates 14:21	199:13,15
253:24 256:9	174:5 193:17	196:21,23	104:23	200:4,6,18
corrected	193:21 247:20	damages 197:1	day 1:15 8:17	203:1
126:19	cover 192:8	dangerous	134:7 173:8	definitions
correcting 148:3	196:13	134:15	229:13 236:19	195:22 202:1
correction	covered 108:10	data 9:14 13:5	240:15 254:22	demonstrated
113:10 158:6	201:24 202:16	21:12 26:13,16	255:1 256:14	57:21
corrections	202:24	26:19 28:22	days 5:18 6:3,6	demonstrative
147:2,5	covering 36:1	31:22 35:3,5	115:3	7:21,23 9:6
correctly 109:16	criteria 75:10	35:12,24 36:11	de 99:20	13:8 28:21
143:23 150:15	178:12	36:24 42:12,16	December 36:12	35:10 47:23,24
168:8 170:10	criticism 63:23	47:12,16 50:17	49:5 59:23	84:12 111:3
239:22	cross 17:6,7	57:20 61:14,15	81:12 82:3	222:17,19
correlated 61:15	23:19 31:2	61:17,18 62:17	139:18 155:24	223:3,13
61:18 64:8	43:16 53:18	62:24 64:8,19	185:24 218:9	229:17 243:18
cost 53:12	67:7,8 71:11	65:3 67:16	224:2	demonstratives
counsel 7:18	71:18 95:10	74:14,22,24	decide 226:24	26:24 83:5,7

84:10,17	53:24 55:2	differ 90:9	discharges	53:3,8,11,12
109:23 205:5	249:6 252:11	194:15	122:12	53:15 56:22
229:21 240:20	252:14	differed 112:23	disconnect	60:6 68:20
244:24 245:3	described 57:10	difference 49:23	180:20	70:24 74:16
Department	250:5 252:22	different 27:9	discuss 129:18	80:15 84:22
89:5	254:3	29:3 30:24	169:24 170:1	95:24 97:2,3
dependent 17:11	describes 33:11	61:23 62:1	discussed 5:24	97:14,21 98:5
61:20	describing 8:1	64:11 65:6,8,9	6:9 35:14	100:16 101:4
depending 15:5	description	80:21 84:7	82:13 100:23	138:24 141:14
35:21 44:8	250:13	86:2 113:11	109:10 155:13	141:16,16,18
depends 77:1	design 57:15	124:5 135:10	176:20 194:13	141:24 142:12
181:18 189:4	90:10 104:13	135:10 136:2	247:8	142:12,20
depicts 106:14	171:9 172:4,4	141:17 144:14	discusses 49:23	147:15,19
Depo 148:14	designed 87:5	147:14 148:14	50:6,7	150:4,6,8,8,11
deposed 91:12	109:7 192:14	150:12 160:10	discussing	150:12,14
91:23 92:22,23	192:19,24	165:15 180:2	219:13	152:1,4 153:15
93:18,18 94:20	desk 6:21	184:4 187:12	discussion 27:19	154:3,5,13
134:10,10	detail 212:1	205:12 238:6	62:7 75:4	155:6,15,16
212:3	details 169:5	238:20 242:11	194:11	158:7,17
deposeth 8:22	detected 172:7,9	differently	discussions	159:23 160:1,4
deposition 60:24	detection 64:8	225:15,17	83:17	161:15 164:15
74:2 82:18	171:19 172:3,6	difficult 34:4	disposal 57:22	175:3,17,18,18
86:22 91:15,19	172:16,17,23	50:15 146:23	192:13 193:7	176:10,13
93:1,16,20,21	173:5,24	191:16	201:4 202:11	180:13 186:17
93:24 94:14,15	174:12 250:8	dikes 12:21	202:21	214:4,11 222:8
94:18 95:4,12	detects 250:9	14:11 17:9	disposed 127:24	235:21 240:22
98:4,4 127:7	determine 159:4	45:12 46:20	disqualifies	documentation
129:14 131:3	178:23 179:12	dimensions	188:4	164:8 175:5
136:4,21	180:3,16	228:23	distance 117:12	documented
140:15,16	195:17	direct 4:4 5:24	117:21,22,23	131:8 143:19
144:13 146:8	determined	138:10 219:9	119:18 227:2,9	143:23
148:3,8,16	126:18 177:11	222:18 229:5	distinguish	documents
149:8 152:3	183:7 187:23	direction 11:9	189:16,22	58:15 70:4
155:1,14	190:11 215:8	29:16 34:7,17	distinguished	78:1 81:4
158:23 159:10	235:17	256:12	230:4	89:15 95:18
159:11 176:20	detract 145:5	directions 13:6	distributed 63:1	98:8 129:17,20
177:7,15	developed 215:6	31:18,24	distribution	130:1 134:13
181:12,21	developing 44:2	directly 151:21	62:17,19,23	137:2 140:23
182:1 189:21	dewatered	159:17 161:8	divide 12:4 32:5	141:10,11,14
212:22 213:1,6	195:17,20	162:12,13	docketed 5:8	142:5,6,8,10
Des 29:12 121:4	dewatering	disagree 114:11	Doctor 32:17	150:18 153:13
121:4,11,16	195:10	discharge	40:3 54:1 55:3	159:6 162:20
123:6,10,19,20	diagram 116:12	121:21 123:13	66:17 248:18	163:3,8 164:4
describe 14:7	diameter 107:5	124:16,19,20	document 27:11	164:7 165:13
22:12 28:24	107:8,12 108:2	124:23 125:2	30:7,23 31:7	168:22 169:4
30:6 33:12	108:5	149:5 151:23	36:19 48:19	170:11 176:23
48:24 52:19	Dick 63:4	159:19 161:9	52:22,23 53:3	198:13 243:4

doing 56:10 83:19 181:7 239:22	18:4,12,15 43:15 66:18,21 66:23 68:10	61:11,13 94:23 175:9	169:20 206:13 206:21 207:8	44:9,16,21 67:15 101:4
dolomite 29:8 36:16 43:22	100:20 101:16 101:18 103:6	duly 8:21	207:16,22	104:3 105:4
dome 199:23	104:13 105:14	dumbfounded 165:18	208:8,19,23	113:2 115:8
door 86:13	105:17,21	dumped 192:16	209:6,12,17,23	116:9 117:6,10
doubly 83:20	106:6,12	Dunaway 16:6	210:4,9,16	117:11 118:5
doubt 11:3 171:5 173:6 245:4	107:23 113:12 115:12 117:7,9 117:19 118:2	duplicate 187:15	either 12:12 15:4 26:7	120:10 121:19
download 56:6	120:7 204:16	dust 46:1	31:24 34:7 40:17 41:11,11	121:19 123:9 125:18,23
downstream 122:13	205:11	<hr/> E <hr/>	42:21 45:11	eliminated 140:5
downward 42:24	drawings 66:10 68:4 89:21	E 2:1,1,2 4:1,8 9:2,2 71:22 230:12	46:22 47:2	ELUC 216:3,12
Dr 5:13 8:17 9:4 11:20 15:7 17:3 21:7 24:21 28:2,24 43:12 53:17 55:18 58:4 59:13,22 60:12 71:19,24 80:11 95:22 110:14 110:21 111:2 144:24 146:5 153:7,14 166:7 179:23 222:18 223:20 226:21 247:4 248:6	90:3,9,10,16 99:13 100:6 101:9 102:10 102:19,21,23 103:3,5,12 104:11,18 105:11 111:19 162:21 165:16 169:5,6,9 205:7	E-L-U-C 216:4	51:4,9 75:16 82:14 134:22 156:23 184:24 198:8 217:4 218:5 226:1 231:10 233:10 233:11 249:10 252:23	216:15,19,22 217:10,10,24 218:2 219:8,13 220:2 224:11 224:12,21 229:5
drafting 189:13	drawn 204:24	e-mail 15:20 16:3,5 30:11 30:13 31:16 74:15,18 139:21,23 140:1 147:10 148:11 151:12 154:10	252:23	ELUC's 217:4
drain 33:23 38:21 106:1 108:21	dredge 128:3 134:17	e-mailed 147:21	elevated 9:21,23 10:10 25:19 26:6 44:23 45:2,9	empty 98:22
drainage 34:2	dredged 127:5 127:23	e-mails 147:11	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	ends 17:9
drained 44:6,7 76:5,10,12	dredging 127:2 127:21 128:18 129:2,18,21,23 130:2,5,18,20 130:21 132:11 132:16 133:18 134:14	earlier 35:15 66:7 68:3 78:19 161:10 221:5	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	Energy 92:5
draining 31:18 31:23 32:12,23	drillers 24:23 45:18 202:9	early 20:16	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	enforcement 5:9
drains 32:7,8 39:9	drinking 181:16 181:19 182:5	east 2:6 14:12 17:8 23:12 25:1,1 29:13 32:7,21 38:11 39:12 40:10,19 106:24 107:1	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	engineer 50:15 86:11 87:9 118:24 162:24 163:22 166:16 170:14,15 193:5,9
drastic 32:13	Drive 2:6	east/west 43:16	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	engineered 108:13 193:8 196:4 199:16 200:7
drastically 120:14	driven 194:18	Edison 72:19	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	engineering 18:4 30:9 43:14 57:15 66:10,22 126:11 133:8 163:5 192:19
draw 194:12	driving 172:21	education 93:8	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	engineers 121:8 193:16 194:5
drawing 17:18	Dubin 2:6 19:5 148:11	effect 97:8	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	ENSR 10:16 32:2 72:13,18 142:10 147:7 219:22 224:8 224:14 225:2 228:18
	due 34:5,5 42:21	effective 192:1	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	
		effort 148:2	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	
		eight 41:17 139:6 168:2	elevation 12:7 16:19,20 17:15 21:8,8,10,15 23:2,8,10,22 23:23 32:13 33:16,20 43:3 43:20 67:2,6 67:10 98:6 105:14 112:23 113:6,12,15 114:5,12,15,16 116:10 117:2 117:13 118:8 118:23 119:4 119:11,19 120:6,19,24 121:11,15 123:14	

ENSR's 10:17	176:21	37:1 141:24	100:8,9 105:11	43:12 45:16
ensure 216:22	errors 126:5	examples 148:19	111:10 137:11	46:7 50:5 52:5
enter 223:2	144:14	excavated 106:7	137:23 138:2	53:4 60:12,17
entering 156:3	especially 33:15	excavation	140:12 151:5	63:23 66:20
entire 52:22	37:20	199:21 200:21	155:4 161:16	170:20 197:8
102:18	essentially 29:15	200:24 202:11	164:13,17	224:1 243:24
entitled 164:8	195:21 237:1	exceedances	167:9,10,19	244:18
Environment	established	215:20 230:10	186:1,2 191:2	explained 68:8
1:5 5:7	36:22 51:2	236:15	203:8 204:12	explaining
environmental	101:16 111:6	exceeds 178:12	221:17,21	245:22
1:3 2:5,9 5:5	216:15 217:4,8	Excel 236:5,11	222:7,9,15	explicitly 248:10
10:18 32:4	estimate 57:8	236:12	223:5,10,12,13	extends 25:6
86:6 89:3,5	84:6,8	exception	223:13 228:21	extensive 178:10
214:24 216:7	estimates 82:20	177:20 195:9	Exhibit's 58:19	extent 18:18
224:8 228:20	et 28:17 61:19	excuse 32:1 36:9	59:17	59:24 172:10
EPA 36:18	61:19	38:9 62:15	exhibits 7:11,11	200:9
50:22 119:23	evaluate 16:13	70:19 71:11	7:23 9:6 70:4	extra 164:23
137:2,4 171:10	43:3	81:10 111:14	84:12 222:18	extract 57:5,8
182:17 183:6	Evaluation	144:20 169:20	222:19 229:18	57:12
183:10,12,21	170:6	198:17 226:18	exist 78:18	extraction 54:6
185:4 186:13	eventually	exercise 78:21	224:18	extracts 57:14
186:14,19,19	173:13,14	exhibit 4:12,13	existed 212:19	eyeball 82:21
187:16,17,23	everybody's	4:14,15,16	existence 99:1	83:3,11 84:1,6
190:10 192:21	71:8	5:23 6:10 7:1,4	existing 15:11	84:7 241:6,10
193:13,22	evidence 23:14	7:20,21 11:14	151:20 161:6	251:17
194:2 195:13	23:16 30:15,22	15:19 16:23	expect 34:20	eyeballed 83:20
195:16 196:3	31:11 53:18	17:20 18:4	172:23	
196:12 198:5,9	70:9,16,23	21:22 24:11	experience	F
214:18 231:17	94:21 121:14	30:4 32:24	77:16 81:3	facilities 137:22
EPA's 184:10	122:11 192:7	33:3 43:10	86:18 87:3	181:15 182:3
195:22	217:4 218:5,6	45:14,15 48:20	88:4,23 93:6,9	201:21 234:11
EPRI 50:22 69:5	exact 67:16	48:23 49:7	128:5 134:2	234:14
182:17 183:12	181:21	52:17 54:3,12	163:6 173:12	facility 88:6
184:2 186:12	exactly 27:16	54:16,18 55:10	expert 14:23,24	94:2 193:8,10
equal 34:2	31:13 72:23	55:23,24 56:20	23:21 24:3	195:21
equally 227:20	85:6 88:2	58:16 59:3,22	49:3 50:8,9,11	fact 30:18 42:22
equipment	122:22 128:1	60:4,7,10,24	50:16 59:23	51:20 74:1
128:4 130:9,21	147:8 165:16	65:17 66:4,6,8	60:1 70:8 94:4	79:18 80:18
131:20 133:6,7	168:23 169:6	66:12 68:16,16	expert's 70:7	83:5 86:10,21
133:9 134:15	170:18 194:23	68:17,17,18,21	experts 70:15	88:12,15 98:5
168:9	196:24 211:16	69:2,4,5 70:18	186:11	99:1 100:23
erosion 106:4	221:6 224:3	70:22 74:14	explain 11:20	119:3 121:10
erosional 123:18	241:9 243:22	77:13 78:10,15	17:5 18:5,14	122:23 126:6
erroneous 84:4	examination 4:4	78:18 81:6,7	23:8 24:21	141:3 156:20
125:17	5:24	81:10,17,17,24	25:2 27:2 28:2	162:22 169:7
error 65:13 74:2	example 30:14	82:6 93:11,12	30:16,17 31:19	181:11 189:20
126:7,8 133:4	31:11 35:14	95:6,6 100:2,4	36:7 38:18	190:1 197:11

198:4 207:1,12 208:2,11 209:3 215:19,23 216:18 219:16 242:19 facts 23:13 failed 94:23 97:24 failure 94:2,8,11 97:11 98:8 failures 91:9 fair 126:20 129:24 145:15 189:24 199:5 216:21 fairly 21:13 36:23 44:10 46:17 168:10 253:8 FAITH 2:2 fall 38:22 falling 61:14 falls 33:17 familiar 87:18 87:22 188:16 190:7 192:10 216:3 famous 178:13 178:14 far 7:19 38:23 148:1 152:7 203:23 211:1 232:3 fashion 168:12 faster 247:1 fbugel@gmail... 2:4 feature 11:6 features 29:15 123:19 February 60:23 207:2 federal 24:4 231:1,9 Federation 89:4 feet 17:12 25:6,7 25:8,12 28:14	33:21 46:1 67:11 68:1 114:6,12,15,16 116:10 117:3 117:18 118:7 120:8 226:3,6 fell 38:21 fellow 50:14 felt 51:8 61:3 211:17 field 57:14,20 168:21 170:18 Fifteen 71:11 fifth 115:15 240:24 figure 11:18,22 14:3 17:1 20:8 20:11,21 21:18 29:19 66:8 223:21,24 228:18 figures 11:17 filed 91:20 98:3 153:18 189:9 files 7:6 fill 14:13 25:7,9 25:12 26:2,5 45:13,24 46:2 46:18 127:23 200:12,14,15 200:16,16 201:2,5,8,22 202:13 215:4 215:10 fills 45:13 final 84:22 90:2 192:9 193:7 195:15 234:6 find 20:4 97:2 98:1 156:5 194:8 218:16 220:11 241:1 finding 140:22 fine 8:6 21:2 25:10 59:21 110:18 162:7,7 166:15 169:3	170:22 234:21 240:12,13 finish 7:14 67:5 67:9 126:3 finished 19:2 finishing 99:16 99:22 firm 78:4 firms 86:2,6 first 8:21 29:11 35:13 52:22 62:3,18 73:20 91:22 103:3,5 103:19,22,24 104:1 106:24 107:1 137:11 137:20,21 147:4 148:2 156:9 180:6,9 180:10 186:9 204:1 218:22 220:14 221:7 243:5 244:22 254:22 five 17:12 23:6 24:8 67:11 68:1 151:8 236:2 238:24 fixed 149:2 flat 249:6 250:14 253:23 254:4 flesh 31:3 117:15 135:20 flip 250:2 flow 11:11 12:5 12:6,9 13:6 29:16 34:7 121:15 122:3,4 122:6,7 123:2 123:4,13 218:23 flows 11:8 12:12 12:13 121:13 215:17 fluctuation 34:6 fluid 39:8	fly 88:13,16 127:4 128:23 215:4,6,9 follow-up 126:23 148:6 148:13,15 151:13 158:22 following 49:18 59:8 71:14 153:3 220:18 220:23 254:13 follows 8:22 foot 23:6,6,7 24:8 77:5 foregoing 256:8 forget 254:24 forgot 189:7 form 46:19 85:6 180:23 231:22 232:2,3 246:19 format 66:9 formation 199:23,24 former 12:19,22 13:21 204:21 205:18,21 210:19 forming 77:23 forward 72:3 98:12 113:5 found 32:1 50:16 98:5 204:2 236:19 foundation 244:17 four 23:6 51:1,3 52:1 61:13 64:14 78:7 81:22 82:12 118:1 134:22 135:13,16 148:23 155:23 156:6 177:18 178:6 185:19 192:13 208:2 236:2 239:9 254:3	four-inch 107:8 108:5,21 Four-ten 54:19 fourth 115:15 237:24 frame 117:9 FRANZETTI 2:19,20 Frendt 30:8,20 31:8,22 74:15 74:15 frequency 236:16 237:11 front 13:16 19:21 79:4 80:1,2 98:2 100:5 115:19 203:10 223:22 229:21 frustrated 146:14,17,19 full 53:5 64:14 64:21 93:13 142:12 169:22 214:23 218:18 fun 255:3 function 236:15 fund 155:21 fundamental 131:5 funny 103:15 further 25:2 71:3 195:7 214:24 furthest 38:10 38:11,12 41:23
G				
GALE 22:3 24:17 102:22 110:4 160:19 164:18 245:14 255:6 gauging 121:22 122:24 gears 229:17 Gen 6:24 7:3				

47:9 72:9,16	146:14,17	102:15 122:4	247:10 252:9	58:9,10 74:6,9
85:7 102:12,16	224:23 254:8	124:13 125:3	graphs 83:7	75:11,22 87:15
131:19,20	Gilbert 63:3,4,4	130:1 161:7	240:21 241:2	97:8,15 98:6
137:22 155:20	give 9:9 35:16	162:8 217:17	241:13,18	109:3 112:22
160:8 164:15	46:13 47:5	going 11:8 18:3	242:13,20	112:23 113:6
175:19 177:18	58:5 71:5 82:9	18:17 21:1	253:22	113:12 114:16
198:6 204:6	102:21 104:23	28:18 30:21	gravel 200:2	114:22,24
207:21 209:11	126:13 150:17	35:13 49:10	gravelly 45:23	115:1,5 117:6
214:6,15	165:1 223:4,18	51:21 55:12	204:19 206:4	117:10 118:5,8
215:17 216:1	225:18 240:23	62:5 66:7,9	gravels 43:24	118:22 119:5
216:16 217:15	250:13	69:4 78:24	gray 45:23	119:19 120:6
217:16,18	given 6:14 46:24	95:2 102:12,19	Great 204:6	120:10,12,13
218:1 235:12	60:23 83:20	103:4 105:13	greater 27:5	120:17 121:19
235:14 237:1	114:14 126:9	110:19 113:5	28:6,13 232:12	136:6,18 156:1
237:13	136:11 147:14	116:24 117:5	235:10 236:8	156:13 178:23
Gen's 153:12	213:8 242:1	123:1 126:3,4	237:10	179:13 180:4
general 9:9,11	gives 117:21	129:15 196:10	greatly 121:10	180:10,17
128:17,24	225:10 238:23	203:2 205:15	121:12	181:19 182:7
180:6 211:10	239:2	206:1 212:22	GREG 2:15	188:23 189:5
211:19,24	giving 160:5	221:22 223:8	greg.wannier...	189:17 202:23
213:18,19	178:22	225:7 229:16	2:17	203:14 204:10
215:16,20,24	glazed 240:9	237:3,21 240:8	ground 11:10	206:13 210:17
217:22	Gnat 6:1 123:18	240:15,17	25:6 61:14	211:12 215:16
generalities	go 13:7 27:17	243:10 246:14	groundwater	216:23 218:23
13:15	49:14 51:5	good 5:1 63:4	9:12 10:23	221:6 234:8,9
generalization	72:3 84:10	71:6 94:16	11:5,8,11 12:4	234:12,19,22
144:6 145:24	93:1 96:1 98:1	125:11 133:8	12:7,17 13:5,6	234:23 235:4
146:4 149:11	106:12 110:4	133:10 152:21	13:14 17:10	252:24
generally 11:8	115:12 120:13	173:1 254:10	21:11,13 22:13	Group 203:13
44:13 189:2	121:1 122:12	gotten 56:11	22:24 23:1,22	Group's 153:12
248:21	122:13 123:16	203:22	24:5,7 26:16	guess 14:2 15:3
Generating	123:17 124:18	grade 67:5,10	26:22 27:4,6,6	18:17 36:13
204:11 214:18	124:20 133:7	graded 107:5	28:5,7,11,16	38:15 46:16
Generation 1:8	150:7 159:3	108:2,6	29:16 32:5,8	54:4 56:22
5:8 72:21 93:5	170:17 171:13	gradient 11:5	32:19 33:11,20	61:4 67:6
235:17	177:9 179:23	13:24 14:1	34:7 35:3	80:10 84:2
geomembrane	184:13 186:13	22:20 25:23	37:12,16 38:1	118:21 128:13
107:16 108:10	195:7 206:10	30:16,18,19	39:18,22,23	160:9 184:3
geosynthetic	208:18 209:10	31:9,12 44:23	40:7,14,18	195:22 206:3,7
166:6,14	220:15 229:2	156:2 157:6	41:6,6,13,16	244:2,16
geotextile 112:2	229:17 235:23	205:21 206:8,9	41:21 42:2,5	guidelines 172:4
112:9 116:4,5	242:17,17	210:18 230:2,4	42:15,18 43:20	
162:1,9,22	244:22 247:4	230:5	44:9,16,20,21	<hr/> H <hr/>
167:6 168:4	247:15 253:14	gradients 32:14	45:5 47:12,20	H 4:8
170:1	goes 22:7 31:17	graph 241:4,19	48:3,4,8,10	H-E-L-P 170:5
getting 28:20	33:16,18,23	241:19 242:24	50:9,10 51:2	half 68:17
116:22 142:21	53:19 86:12	244:23 247:5	52:8 57:21	138:21

halfway 184:20	165:2 174:7	Hart 98:10	101:19 102:3	heart 160:18
Halloran 1:13	179:4,17,21	hate 21:3	102:22,24	heavy 99:2
5:1,2,19 6:2,5	180:22,24	hazardous 57:6	110:4,6,12,16	130:21 131:19
6:20 7:7,14,17	184:6 185:11	178:12,14	110:20,23	133:6
8:6,10,13,16	188:9 190:18	HDPE 15:9 16:7	111:14 113:23	heck 244:18
8:23 10:5,8	190:22 191:10	108:13 109:1	115:2 116:14	height 123:9
15:6 19:1,9,14	191:14 193:19	109:17 116:5,6	117:14 118:11	help 116:20
19:18,22 20:2	195:2 201:10	149:4 151:19	118:18,21	144:4 170:5,7
20:7,10,15,24	201:15 202:5	161:5 166:2	124:8 125:9,12	171:10 220:10
21:3 23:15,18	203:4,19,24	168:3,5 173:12	132:5 133:14	high 9:19 39:13
24:12 27:17,21	211:3 214:7	173:21	133:22 135:11	41:24 75:7,7,8
31:1 34:11	219:1 220:15	head 190:8	135:18 137:15	75:14,19,20
35:16,19 40:2	220:20 221:1	194:18 239:22	144:1,9,20,23	76:1 77:2
49:8,12,16,20	222:11,14,21	headache 240:7	145:12,22	96:22,23
50:2 53:16	223:1,6,11,17	heading 8:1 52:2	146:3 150:20	121:13 123:12
54:17,22 55:15	226:20 237:4	headings 8:2	151:2,7 152:15	123:21 130:20
56:7,13 58:3	240:10,14	hear 177:21	152:19,23	182:16,18
58:20 59:1,5	243:11,16	heard 125:10	153:5,17,22	183:24 253:8
59:10,14,16,19	244:4,8,12,15	161:24 176:9	156:24 160:17	higher 13:10
60:3 62:10	245:12,17	hearing 1:12,13	160:21 164:5	28:9,16 32:19
63:14,19 65:18	246:1,18,22	5:1,3,19 6:2,5	164:10,16,21	37:3,4,5,7,8,11
65:20 66:2	248:2,14,18	6:16,20 7:7,14	165:2 174:7	37:15,24 38:1
68:24 69:6,18	251:6 252:17	7:17 8:6,10,13	179:4,17,21	38:3 39:4,16
70:2,17 71:4	254:9,15	8:16,23 10:5,8	180:22,24	39:17,21 41:4
71:10,16 79:7	hand 8:18 66:9	15:6 19:1,9,14	184:6 185:11	41:5 42:14
80:4,9 95:5,8	handed 17:21	19:18,22 20:2	188:9 190:18	47:20 48:3,5,7
98:18 100:7,11	21:22 30:5	20:7,10,15,24	190:22 191:10	48:9 51:1
101:13,19	43:11	21:3 23:15,18	191:11,14	97:15 98:6
102:3,24 110:6	happen 12:3	24:12 27:17,21	193:19 195:2	113:10 120:11
110:12,16,20	131:7	31:1 34:11	201:10,15	121:15,15,17
110:23 111:14	happened 115:9	35:16,19 40:2	202:5 203:4,19	121:18 123:17
113:23 116:14	120:21,22	49:8,12,16,20	203:24 211:3	highly 17:11
117:14 118:11	131:16 134:19	50:2,12 53:16	214:7 219:1	218:22
118:18 124:8	146:8 169:16	54:16,17,22	220:15,20	highs 119:12
125:9,12 132:5	179:20	55:15 56:7,13	221:1 222:11	historic 156:16
133:14,22	happens 33:17	58:3,20 59:1,5	222:14,21	212:8,10
135:11,18	34:1 44:9	59:10,14,16,19	223:1,6,11,17	213:10 250:1
137:15 144:1,9	124:13 134:8	60:3 62:10	226:20 237:4	historical 157:9
144:20,23	190:24	63:14,19 65:18	240:10,14	hold 39:8 147:13
145:12,22	happy 20:1	65:20 66:2	243:11,16	170:11 190:19
146:3 150:20	247:1	68:24 69:6,14	244:4,8,12,15	193:17
151:2,7 152:15	hard 86:24	69:18 70:2,6	245:12,15,17	hole 25:5,5
152:19,23	191:11	70:17 71:4,10	246:1,18,22	106:7 224:22
153:5,17,22	hardcopies 19:7	71:16,20 79:7	248:2,14,18	225:3,4,5,10
156:24 160:17	20:5	80:4,9 95:5,8	251:6 252:17	227:5 228:4
160:21 164:5	hardcopy 19:11	98:12,18 100:7	254:7,9,15,17	holes 224:7,11
164:10,16,21	harm 162:14	100:11 101:13	254:23	224:16,20,24

Holland 98:10	194:1 199:2	imagine 32:11	196:15 199:15	242:15
home 85:20	240:8	immediate	219:8	independent
honestly 211:6	identical 147:24	22:20	inadmissible	62:16
Honor 5:22	245:3,3	Immediately	53:18	indicate 42:12
222:24	identification	174:3,11	inches 109:14,19	indicated 51:8
Honorable 1:13	4:10 48:21	impact 172:21	111:24 112:11	61:7
hopefully	58:17 60:8	178:24 179:12	112:15	indicates 25:11
254:19	68:22 222:10	180:17 181:15	include 57:6	175:7 213:16
horizontal	identified 72:6	182:4 189:17	190:11 199:16	227:18
117:20,23	72:12,18 74:1	212:17 217:5	included 154:15	indicating 118:4
hour 1:16 247:1	74:19 136:1	218:5,6	183:15 185:17	indicator 9:18
housekeeping	137:10 138:2	impacted 176:17	200:17 230:1	50:19,23 58:12
5:14,17 8:14	140:10 154:17	impacting	232:14	183:3,7 185:5
221:3	210:18 216:18	212:19 215:24	includes 200:2	185:8 186:10
hover 41:8	identify 12:15	impacts 156:13	230:10	187:12 189:2
HPD 112:5	138:9	impeachment	Including 137:4	206:19
hydraulic 30:14	IEPA 50:22	135:10	incomplete	indicators 182:9
31:11 34:21,22	183:8,12,14	implication	53:15 58:22	182:14 183:13
190:8 194:18	185:19 186:13	111:8 117:12	inconsequential	indirect 122:11
hydraulically	186:16,23	150:23	213:21	indirectly
128:3	187:9,15,16	implies 111:4,11	inconsistent	121:20
hydrogeologic...	198:20 199:4	imply 157:6	69:20	individual 51:6
29:3	illegible 18:11	important 29:10	incorrect 58:12	industrial
hydrologic	18:19	57:3 89:23	94:22 125:23	156:17 157:11
43:14 62:24	Illinois 1:1,15	96:23	126:10,13	industry 86:19
170:6	2:3,7,22 5:3	imposed 194:18	141:23 142:14	130:20 197:6,8
hydrology 62:18	13:13 27:5	impossible	142:19 143:4,9	197:13
hydrostatic 44:8	28:6,11 36:18	122:15 189:21	148:24 149:9	influence 13:5
44:10 76:6,14	36:20 37:12,15	impounded	149:19 205:16	inform 112:24
92:4,8,17,20	38:1 39:18,22	194:19	incorrectly	information
93:4 94:7,10	40:6,13,18	impoundment	50:16 97:19	17:14 44:14
94:21,24 95:19	41:5,9,21 42:1	97:5 164:9	increase 123:4	50:17 89:3
96:8 97:4,9	42:4,15,17	195:17 196:4	123:14 245:8	92:13 96:5
98:21 99:3,14	48:4,9 75:11	199:22	246:11	120:4 122:1
101:5 125:16	75:22 87:9,12	impoundments	increased 40:12	123:17 126:14
125:22 126:18	87:16,19,22	95:19 192:5	123:4	126:15 148:19
Hypalon 15:3	108:17 120:14	194:12,15,17	increases 123:13	154:4 155:2
hyperlink 58:2	120:23 163:23	195:9,19	124:16,19,20	169:14 212:4
hypothesis	177:22 182:18	Improper 135:9	125:2	213:15,17
65:10 84:4	185:21 197:24	impune 169:2	increasing 39:15	informed 232:9
hypothetical	198:5 207:7	inaccuracy	39:20 82:14	234:23
113:5	214:18 216:12	190:21	83:8 241:5	informs 85:13
<hr/>	217:3 227:13	inactive 191:23	247:16 250:1	initial 126:7
I	227:15 232:13	192:3,22	250:14 251:16	137:20 176:15
idea 31:13 50:13	235:11 236:20	193:24 194:11	251:21,24	229:8
54:2 62:19	251:19 252:23	194:14 195:9	253:16,24	initially 73:16
173:18 193:14	256:1,14,22	195:14 196:13	incumbent	125:15

injection 199:23	Interrupting	111:4,19,23	99:21 101:6	95:22 110:14
insert 43:17	124:1	113:22 114:17	113:14,14	110:21 111:2
inside 38:20,21	intro 53:2	114:22 116:19	116:22 122:20	144:24 146:5
38:22 104:4	introduce 49:6	121:1,4,16	122:22 123:5	148:13 153:7
insisted 19:6	58:19 59:22	122:1 124:22	123:14,16	153:14 158:9
inspected 166:4	65:16 68:15	151:18 161:4	124:14 125:1,1	158:16 166:7
installation	221:9 222:6	163:20 165:12	125:4,6 126:10	179:23 223:20
166:3,6,14	introduced	200:20 202:18	130:8 133:3,3	226:21 244:24
170:9,12 172:7	15:19	234:16,18	134:12 135:18	247:4 248:6
172:9 174:10	involved 88:9	238:10 240:21	144:4,18 146:8	Kunkel's 59:13
174:13,14	189:12	241:1,3 243:6	146:18 148:21	59:22 222:18
installed 15:9	iron 184:21	247:13 248:12	149:10 152:6,6	243:19
163:20 198:6	isotropic 34:15	253:6	152:8,10	
installers 163:13	34:15	judge 228:1,2	153:18 160:18	L
166:20	issue 31:13	July 91:23 92:24	162:17 168:13	labeled 12:7
instance 230:13	46:16 61:10	93:3,11 125:14	168:16,17,18	106:13
231:1 233:6	120:13,17	125:19 137:12	169:2,17 172:1	laboratories
instances 150:23	173:22 177:3	140:18,23	173:9,11 178:8	61:8
234:5	issued 104:19,20	141:22 143:12	179:22 189:10	laboratory 57:9
instructed	104:24 135:24	145:16 148:20	194:2,3,23	61:8
169:16	136:19 198:9	154:4 160:15	195:16 196:11	lack 184:22
instrument	214:17	176:16 204:11	196:24,24	Lafarge 131:23
168:9	issues 149:7	223:21	198:3,8,23,23	132:4,11 133:2
integrity 2:9	items 148:7,13	jump 70:7	198:24 200:16	133:12,18
172:14 174:13	148:14	June 11:24 12:1	201:1,13	135:2,4,15
intended 57:4	J	K	210:24 214:5	lake 11:6 12:14
57:11,17 58:13	J 3:4	K-O-S-S-O-N	217:7 220:6	16:20 17:11
intensive 47:8	jackhammer	154:22	222:22 224:21	21:10
intent 157:4	168:9	keep 15:7 40:3	226:3,7,11,13	LAM 2:10
intentionally	James 4:2 8:20	78:24 105:13	226:14 233:3,8	land 155:12,13
193:7	158:16	219:3	233:10 234:14	199:21 200:21
interested	January 30:10	kept 140:22	243:10,13	216:7
118:24 185:19	254:19	kind 21:4 41:8	244:16,17,17	landfill 170:6
212:15 219:6	JENNIFER	51:22 64:9	252:21	171:14 190:15
236:3	2:20	133:9 202:10	knowledge 76:9	192:19 193:3,5
interesting	Jim 148:13	kinds 63:8 64:9	80:23 136:14	193:24 196:4
38:16 39:1	jn@nijmanfra...	knew 16:7	Kosson 154:22	199:14,16,20
Internet 52:22	2:23	169:15	154:24 186:12	199:20 200:2,8
53:13 54:21	job 170:19	know 14:10	KPRG 205:9	landfills 190:11
55:21	John 49:3 50:8	21:20 31:1	Kunkel 4:2 5:13	191:3,5,7,8,23
interpret 34:4	50:14 51:8	38:24 51:10	8:17,20 9:4	191:24 192:3,6
50:16	52:7,7 60:16	53:14,17 58:1	11:20 17:3	192:13,14,23
interpretation	60:21 157:4,20	61:12 62:22	21:7 24:21	192:24 195:14
11:11,23	Johns 155:20	72:11,22 88:1	28:2,24 43:12	196:3,14,15
157:21 158:1	Joliet 27:10 51:6	88:1 92:11	53:17 55:18	199:15
interpretations	109:12,23	96:13 97:6	58:4 60:12	large 19:7,10
50:14			71:19,24 80:11	20:5 66:9

102:19 201:13 205:4 225:12 larger 86:2,5 largest 88:15 LaSalle 2:21 lasted 97:12 late 42:16 87:6 229:12 247:1 laterals 107:9 Law 1:4 2:5 5:5 layer 76:21,23 107:12,20 108:8 112:14 116:2 172:18 172:19 layout 29:1 ldubin@elpc.... 2:8 leachate 13:21 42:24 52:3 57:13,17,19,23 58:14 154:15 171:13 189:3 lead 84:3 Leading 10:2 50:1 leads 128:6 leak 171:3,4,8 171:19 172:3,6 172:15,17,23 173:5,7,13,23 174:11 175:9 leaked 91:2 175:8 leaks 15:12,12 172:7,8 176:10 leaky 34:5 40:21 42:21 45:11 51:4 leaves 168:10 led 162:19 left 9:4 38:13 78:7 141:19 left-hand 43:17 117:19 legal 203:3 legend 105:18	legible 20:19,22 let's 20:8 21:19 27:17 78:24 86:7 93:1,10 93:15 105:13 109:22 115:12 137:8 148:22 151:5 152:24 160:14 172:5 180:15 181:24 184:13 191:1 203:8 206:10 206:18 207:6 207:15,20 208:6,18 209:10 217:9 220:15,20 223:7 243:8 244:22 246:19 247:4,15 253:9 253:14 letter 214:17 level 17:11 33:18,22 67:17 68:2 97:9 121:21 122:5 123:2,4,14,20 124:13,18,19 125:3 245:9 251:18 253:16 levels 32:10 34:6 44:21 61:14 75:7,7 77:2 122:20,21,23 123:9,9,12 124:22 125:1 184:23 206:22 207:3 License 3:4 likes 196:2 likewise 129:24 limestone 43:23 46:2 112:15 limit 250:8 limitation 65:22 80:14 limitations	78:11,18 80:22 limited 87:14,17 169:13 limits 64:8 Lindsay 2:6 148:11 line 65:6 95:14 112:22 127:16 129:16 131:4 139:2 174:2 186:9 205:1 209:16 210:8 213:6 230:17 242:5 linear 61:6 64:1 64:4,22 65:4 83:2,15,19,24 lined 16:7 44:6,7 58:11 76:5 96:12 109:17 138:24 liner 15:11,12 43:7,9 44:11 44:11 76:21 88:19 91:4,9 94:2 96:15,18 97:11,23 99:2 102:14 103:20 103:22 104:6 105:8 106:13 106:20,20 108:14 109:2,4 112:5 113:13 113:15,19 116:2 127:2,20 128:6,18 129:4 130:22 132:16 132:19,20,23 151:20 161:6 162:14 163:2 163:24 164:9 166:2 171:13 172:11,21 173:7,19,20 174:1,10 175:9 198:5 liners 76:16	96:22,24 163:6 163:13,20 166:1 171:3,4 171:8 173:12 197:7 198:10 lines 12:7,8 64:14 118:1 127:16 206:1,1 lining 96:20 152:5 list 27:3 28:4 56:19 103:12 148:14 184:1,2 236:9 239:14 listed 36:18 121:18 143:14 230:18 233:3 235:11 liter 37:12 207:17 236:4,7 252:24 253:11 little 12:2 29:3 43:17 53:13 55:20 64:4 82:9 88:6 103:15 104:8 105:18 128:12 129:14 139:2 142:4 146:4 165:18 173:1 184:3 187:7 219:2 220:16 229:17 237:22 240:9 243:24 LLC 1:8 5:8 LLP 2:19 loads 44:10 located 12:20 29:24 30:2 45:21 location 96:7 locations 10:17 46:19 130:9 228:23 lock 121:5,7 122:8,9,10,15 log 24:23 45:18	45:22 202:9 logistics 191:15 logs 25:15 51:16 73:1,4,5 213:20 219:17 219:18,20 229:9,14 long 39:9 97:12 255:4 long-term 61:5 longer 39:8 170:11 177:2 look 13:7 32:9 34:17 57:20 64:13 77:20 81:16 93:10,15 98:12 100:4,24 101:1 103:4 105:17,21 106:5 107:18 109:22 110:14 111:18,21,22 117:6,24 120:5 126:4 127:7,9 128:11 129:15 131:3 138:23 139:6 148:22 150:8 151:5 156:9 159:6 160:14,15 161:18 175:17 181:20,24 186:16 203:8 205:24 206:18 207:6,15,20 208:6,14 209:12,16 212:1 214:21 218:8 228:21 230:12 242:13 243:8 245:11 245:13,20 253:9 looked 24:4 35:6 47:11,14 73:2 99:13 100:5 101:3 105:11
--	--	---	--	---

119:3,10 141:5 149:22 154:24 156:4 240:6 249:9 looking 22:17 28:20 35:12 45:15 47:22,23 48:17 61:10 79:24 106:17 106:23 107:7 110:9 113:11 116:8 127:6 128:22 143:11 143:12 155:10 157:17 159:14 161:15 162:17 174:17 204:6,9 204:13 206:21 207:22 210:4,8 213:5 228:18 242:14 246:11 246:13 250:21 250:22 looks 18:10 47:22 69:20,21 90:17 111:9 249:5 lot 96:4 115:3 120:11 137:7 140:17 146:11 lots 183:13 low 231:18 252:8 lower 16:19 32:10 43:17 113:8 192:4 237:16 lows 119:12 lumped 187:18 lunch 151:8 153:6 154:2,10 Lux 161:21,24 162:18 177:24 lying 252:19 Lynn 16:6	M 2:20 9:2 71:22 Maddox 132:13 175:22 magnitude 37:8 37:22,23,24 maintenance 175:7,10 176:12 major 29:14 46:10 majority 142:24 150:15 making 123:8 123:11,12 130:14 133:11 144:5 145:24 196:5 management 87:15 151:17 161:1 234:8,9 234:12,19,22 234:24 235:4 manganese 9:18 26:18 28:17 47:15,16,18,19 48:2,8 182:9 183:3,17,18,22 184:21 185:5 185:18,20,21 187:3,10,17,23 188:5,22 189:1 207:6,7,9 208:6,7,8,23 208:24 209:16 209:17 210:8 210:10 215:21 215:23 225:19 233:18 Mann-Kendall 63:3,5 64:17 82:23 83:13 Mann-Mandell 63:9 manner 30:24 mantel 29:6 manual 171:9	manufacturer 173:19 Manville 155:21 map 14:2 18:19 19:7,11,21 20:19 204:16 204:18 205:3 212:9 217:10 220:4 226:11 map/chart 11:21 maps 28:22 35:12 205:4 216:19 March 60:16 93:18 136:4,21 138:6 139:23 140:16 147:10 147:12 148:12 167:8,14,15 169:21 218:14 218:15 Maria 16:6,6 30:9,9 74:16 mark 69:1 marked 4:10 48:19 58:15 60:6 68:20 77:13 81:17 85:12 221:18 222:8 236:4 marking 222:3 223:12 mass 123:6 material 25:7,9 25:12 26:2 29:7 173:20 192:16 201:3,5 201:8 227:3,10 materials 34:3 165:19 166:6 166:14 200:12 math 239:18,22 matter 5:4 34:17 254:21 matters 5:14,17 8:14 88:5 221:3	maximum 23:22 23:23 24:1 184:23 mean 24:1 26:13 67:17 68:1 102:1 127:21 128:23 132:19 134:23 172:1 173:7,10 179:7 180:9 188:19 193:1 202:22 216:6 238:4 244:12 248:1 249:7 meaning 234:24 meaningful 242:6 means 16:8 30:16 31:19 33:12 34:18 38:18,19 57:4 62:4 99:19 104:8 142:3 157:12,13 166:8 196:3 199:20 232:2 meant 51:11 157:5 196:16 213:19 250:16 measured 43:21 233:5,7 237:23 measurements 121:21,22 mechanical 130:21 median 36:5,10 37:2,6 meet 24:8 200:4 meets 119:23 melt 33:17 38:23 memo 175:21 memory 98:15 113:18 177:8 205:15 mention 74:6 97:10 mentioned 14:5	24:9 26:4 73:14 74:4 75:6 76:4 88:24 94:17 105:7 127:20 189:15 212:8 214:1 244:16 253:14 mercury 176:17 177:3 183:15 metal 115:16 118:9,14 method 54:5 201:4 methods 61:9 Michigan 12:14 16:20 21:10 mid 12:11 middle 32:6 81:21 151:16 160:24 194:10 199:13 Midwest 1:8 5:8 6:24 7:3 16:9 47:8 51:19 58:8 60:21 66:22 71:18 72:9,15,20,22 85:7 93:5 102:12,16 126:12,13 131:19,20 137:22 153:12 155:20 160:8 164:15 175:19 177:18 198:6 204:6 207:21 209:11 214:6 214:15 215:17 215:24 216:16 217:15,16,17 218:1 233:7 235:12,14,16 237:1,13 Midwest's 11:23 mil 112:5 milligrams
M				

37:11 207:17	201:22 202:12	84:15 85:1,2	MW-2 39:10,11	95:19 121:3
236:4,7 252:24	Mm-hmm 52:4	113:3,17,22	39:14,19 45:19	181:5 224:19
253:11	54:14 77:12	115:14 116:19	45:20,21,21	226:1,2,8,9,10
millionths	136:13 138:4	119:4,6 136:1	205:20 207:20	228:6,11,15
236:20	166:21 169:10	159:7 161:11	207:23 208:8	nearly 37:22
mind 72:3	232:14 235:24	211:7	208:15 250:22	44:18
mine 160:10	238:10,12,14	motion 1:12	MW-3 24:24	necessarily
200:1	model 171:10,11	69:9,11 223:2	39:11,19 40:8	29:17 31:20
minimal 172:20	171:12 217:5	motions 70:13	208:18,20,24	77:1 121:12
minimis 99:20	218:5	mouthing 33:11	209:7 246:10	149:11 187:14
mining 86:19,24	models 171:11	34:4	251:2	187:14 211:20
minor 143:8	Mohawk 2:3	move 49:6 58:18	MW-4 37:13	necessary 102:5
minute 14:17	moment 59:4	59:21 65:16	40:7 209:10,17	169:1
66:8 71:5	110:21 165:1	109:1 182:24	209:24 246:13	need 20:4,5
95:17	174:18 199:9	222:6,17,18	247:4 251:9	54:10 73:11
minutes 71:11	Monday 148:12	246:24	MW-5 13:9	82:9 100:24
109:11 151:8	221:6	multiple 31:18	22:24 23:1	126:4 176:13
220:21 240:11	monetary 197:1	31:24	37:14 210:3,5	188:12 198:18
mischaracteri...	money 196:17	municipal 57:6	247:15 251:16	224:4 227:1,8
150:22	monitored 46:12	MW 206:11	MW-6 13:11	228:17 229:13
misinformation	231:9,17	224:14	248:21 251:21	needed 149:1
15:1	monitoring 9:13	MW-41 :13	MW-7 13:9	needs 6:17
missed 23:3	22:19 26:17	MW-04 209:12	22:15 37:14	Negative 8:15
missing 148:19	27:4 28:5,10	MW-1 22:14	41:1,12 249:1	neglected
148:21 149:9	29:8,20,22	25:15,19 37:10	251:24	222:17
misstate 14:5	32:2 36:16	38:9,9,24	MW-8 37:14	Neither 184:1
misstatement	43:22 45:19	39:11 42:21	41:12 249:7	Network 1:4 5:6
30:22	46:12 47:8,10	206:7 207:9,16	252:4	never 87:11
misstates 119:14	136:6,10	250:7	MW-9 37:10	114:21 127:5
133:13 137:13	180:16 203:15	MW-10 41:22	41:7,19,22	156:19 199:5
144:3 145:23	204:10 205:16	42:11,12 219:7	249:17 252:8	219:16
150:21 179:1	205:17 206:17	225:6,21,24	252:11 253:3	Nevermind
179:19	209:11 210:17	226:1 229:4	MWG 22:8,8	153:18
misstating	215:19 219:8	253:9	175:5	new 7:1,24 8:17
201:12	219:17,19	MW-11 10:11	myriad 63:6	8:17 141:16
mistake 64:10	221:7 230:2,2	37:21 42:6,9,9		195:8 254:8
114:1 134:7	231:2	224:13 225:1	<hr/> N <hr/>	255:1
mistakes 134:3	Monroe 256:21	226:8,10	N 2:1 4:1 9:2,2	nice 51:14
146:9,11,15,16	Montana 88:23	249:24	71:22,22	Nijman 2:19,20
146:18,20	89:2,4,6,11,16	MW-12 42:11	name 5:2	4:5 6:13,16,23
misunderstan...	89:17 90:21	224:13 228:10	narrating	8:7,8 10:2
171:2	91:24 92:3	228:14,15	246:16	15:22 16:1
misunderstood	126:23 130:4	MW-13 219:8	nasty 230:12	17:23 18:17,21
95:17	morning 5:2	MW-14 10:11	National 89:4	19:2,4,19
mixed 40:16	20:17 72:2,6	219:8 224:20	near 23:11	20:11,23 21:24
177:22 192:15	73:1 77:10,18	MW-15 228:5,6	33:14 36:1	23:13,19 27:8
200:12 201:5,8	78:10 79:13	228:7,11,13	46:17 64:24	27:16 30:21

35:20,21 49:10	185:9,15	non-parametric	239:16 240:23	237:3 243:9
50:1 52:21	188:11 190:23	62:4,14,14	241:1 249:19	251:4 252:13
53:1,6,10	191:1,4,8,11	63:2,8	250:11	objecting 55:13
54:15,20 55:6	191:13,16,18	normal 62:22,23	numbered	objection 10:2
55:11 56:3,8,9	193:23 195:4	205:22	240:22	18:18 20:19
58:21,22 59:24	201:17,19	normally 62:24	numbering	23:13 50:1
60:4 62:5	203:6,7,12,22	north 17:8 38:10	223:9	52:21 54:15
65:21,22 66:11	204:5,15,17	38:12 43:18	numbers 7:9,10	55:6 56:9 58:1
66:14 68:23	210:24 211:4,5	67:9 107:19	7:24 8:4 13:16	60:2 66:1
69:13,23 71:6	212:9,11 213:3	108:17,22	35:14 36:1	68:23 102:2
71:9,18,19,20	213:4 214:8,10	155:13,19	81:21 114:8,10	111:1 116:11
71:23 73:10	217:9,12 219:2	212:13,16	116:13,17,18	124:6 125:7
79:11 80:8,10	219:3,5 220:7	213:17,18	116:22 119:9	135:9,21
80:12 95:7,10	221:19 222:2,5	214:2 217:15	139:9,16	137:13 144:2
95:11 98:20	222:13,22,23	northeast 12:12	141:15,17,18	144:21 158:10
100:8,9,13	223:19 226:22	38:10	141:21,23	179:1 184:5
101:17,23	237:7 240:18	northern 215:2	142:10,13,14	190:19 201:9,9
102:2,8 103:2	243:17,18	note 6:22 38:16	142:19 143:2,3	201:11 222:12
110:1,8,17,18	244:2,6,11,14	66:3 157:2	143:4,9,13,15	222:13,23
111:7,13,17	244:19,21	228:22,22	149:15,17,17	243:24 244:3
113:24 114:1,3	245:23 246:3	noted 9:24 192:3	150:12 164:14	244:11,14
116:15,16,23	246:20,21,24	notes 60:16,20	230:1 232:11	245:24 246:15
117:17 118:12	247:3 248:5,16	60:23 67:13,14	numerical	objectives 215:5
118:14 119:2	248:20 251:8	69:14 81:11,15	171:11	objects 20:11
119:21 124:3	253:2 254:7	168:22 170:18	NW 2:11	obligation 56:12
124:10 125:11	255:7	196:10 256:11		observation
125:13 132:7,9	Nijman's 20:19	noteworthy 37:9	O	97:13
133:16 134:4	nine 139:14	notice 176:22	O 9:2 71:22,22	obtained 218:1
135:14,22	149:3 150:2	214:17	203:11,13	obtaining 57:5
137:18 143:22	151:11,14	November 207:2	Oakland 2:16	116:17
144:7,11,12,16	160:16	254:21,24	oath 8:17	obvious 174:14
145:7,14,19	nitrate 230:18	number 7:12	object 18:18	obviously
146:6 151:4,9	231:20,21,21	22:1 28:8 66:8	30:21 53:10	112:22 236:17
151:10 152:21	231:22 232:1	68:17,18 103:6	62:6 79:5 80:3	occur 9:19 62:17
153:8,9,10,19	232:15,19	139:2,24	98:17 101:12	92:4,9,10,11
153:20,23	nitrogen 230:18	146:20 148:23	110:11 113:21	92:20 93:5
154:1 157:8	231:19,20,21	149:2 150:1,18	117:8 118:17	98:22 129:23
158:14 160:20	231:21,22,23	151:24 154:14	119:14 124:1	182:15 217:6
160:23 164:7	232:1,15,19	155:5,10,23	133:13,20	218:6
164:12,17,19	No.'s 4:13 58:16	156:6 159:10	143:21 144:15	occurred 11:24
164:24 165:4	NO2 231:23	159:15 160:4	144:22 145:10	47:6,8 130:6
166:24 167:2,3	232:2	174:19 175:2	145:18 150:19	176:10 178:24
167:10,13,18	NO3 232:2	219:6 223:5	150:19 152:13	179:13 180:4,7
167:21 168:1	nod 8:15	232:12 235:10	156:22 179:14	180:9,10,17
174:9 175:1	non-detect	235:12 236:6	180:19 185:7	occurring 26:14
179:9,15 180:1	207:13 208:12	236:15 237:2,9	188:7 190:17	42:20 180:13
181:3 184:8	209:4,21	237:16,22	202:3 203:2	182:18

occurs 33:17	135:18 137:15	20:20 21:19,21	205:8,10,20	opinion 10:12
October 1:16	144:1,9,20,23	23:5 24:9	206:6,7,10	13:5 17:17
5:10,12 7:2,5	145:12,22	26:15 28:18	210:23 211:4	21:7 23:21
254:17,23	146:3 150:20	29:17 35:2,9	211:15 212:2	24:3,8 26:10
offer 59:2,3	151:2,7 152:15	43:2 57:13	214:14 215:14	45:5 46:13
69:15,22 70:5	152:19,23	59:15,18 68:24	217:13 218:16	47:5 53:17
70:23,24	153:5,17,22	71:4 72:3,15	220:4 221:24	58:5,7 65:12
offered 58:4	156:24 160:17	78:23 79:22	222:14 223:1	73:19 79:2,10
office 20:6 86:12	160:21 164:5	80:18 81:5,16	223:18 224:4	119:24 124:21
Officer 1:14 5:1	164:10,16,21	82:8,11,12,23	224:15,23	126:17,19
5:3,19 6:2,5,17	165:2 174:7	83:17 84:9,14	226:9 228:4,13	129:1 133:10
6:20 7:7,14,17	179:4,17,21	85:8,11 92:14	231:24 233:21	139:12 143:15
8:6,10,13,16	180:22,24	94:10,16 95:2	235:9 236:5	143:17,17
8:23 10:5,8	184:6 185:11	101:3 103:10	238:7,23	145:6 147:1
15:6 19:1,9,14	188:9 190:18	103:18 104:7	239:13,16,18	149:20 154:18
19:18,22 20:2	190:22 191:10	105:16 106:5	240:4 243:3	156:13 162:3
20:7,10,15,24	191:14 193:19	106:23 111:21	244:6,19	170:12 187:21
21:3 23:15,18	195:2 201:10	114:11,14	245:21 248:4	232:23
24:12 27:17,21	201:15 202:5	116:24 117:3	249:23	opinions 44:2
31:1 34:11	203:4,19,24	119:7 120:18	old 7:24 27:10	46:5 50:8
35:16,19 40:2	211:3 214:7	122:16 123:23	190:11 191:4	77:14,23 84:24
49:8,12,16,20	219:1 220:15	125:11,19	201:6,21,21	85:2,10,13
50:2 53:16	220:20 221:1	127:7,15	202:21 212:4	90:22 122:17
54:16,17,22	222:11,14,21	128:20 129:8	212:13	130:24 131:6
55:15 56:7,13	223:1,6,11,17	129:13 134:5	once 15:17	136:10,18,23
58:3,20 59:1,5	226:20 237:4	137:17 138:1	173:8 248:7	138:17 139:4
59:10,14,16,19	240:10,14	138:12 139:6	One-hundred	139:15 140:19
60:3 62:10	243:11,16	140:10,14	17:23,24	140:24 141:12
63:14,19 65:18	244:4,8,12,15	142:16,18,21	one-inch 107:5	142:6,9 143:19
65:20 66:2	245:12,15,17	150:7 151:9,14	107:12 108:2	145:5,9,17
68:24 69:6,14	246:1,18,22	152:19,23	ones 48:16 70:1	146:24 158:23
69:18 70:2,6	248:2,14,18	154:21 155:10	244:22	165:11 169:2
70:17 71:4,10	251:6 252:17	156:24 157:14	online 254:23	178:22
71:16,21 79:7	254:7,9,15	157:17 158:3	onsite 45:8,10	order 37:8,22,22
80:4,9 95:5,8	official 256:13	158:24 159:22	open 103:9	37:24 46:19
98:18 100:7,11	offsite 45:1	160:9 163:11	107:5 108:2,6	122:6 159:4
101:13,19	156:2,21	163:15 167:20	217:21	ordinate 242:10
102:3,22,24	157:23 181:16	170:19,20	operation	Ordinates
110:5,6,12,16	182:4	173:4,14	177:19	242:11
110:20,23	oh 18:8 64:20	174:17 180:3	operations	oriented 45:20
111:14 113:23	81:23 102:24	180:22 181:24	195:10	108:17,21
115:2 116:14	114:22 147:13	184:3,16,18	operator 133:4	original 7:11
117:14 118:11	167:16 228:6	186:6,22 187:4	134:7	16:18 29:20
118:18,22	okay 5:18 6:23	193:19,20	opined 91:1 92:3	68:19 141:14
124:8 125:9,12	10:7 12:22	195:13 196:20	92:8 125:15	141:18
132:5 133:14	14:4,14 16:12	197:24 198:4	127:1 211:6	originally 73:19
133:22 135:11	19:14,17 20:2	198:16 199:3,8	opining 169:12	221:8

outline 43:2	149:2 150:2,24	33:13 59:13	permit 16:11	placement
outlined 198:21	151:11,13	72:18 98:10	100:3 197:16	173:19
outside 9:13	154:12 160:15	102:20 109:17	198:18,19,21	Plaines 29:12
14:8 26:5	161:19 165:5	130:16 137:21	permits 198:10	121:4,5,11,16
45:11 51:23	165:20 166:23	137:22 165:19	198:16 199:6	123:6,10,19,20
107:3 202:9	168:2 169:19	169:11 171:24	permitted 203:5	plaintiff 89:8
overlying 43:23	175:10 184:15	185:20	perpendicular	plan 68:14
overrule 53:20	184:20 186:1,8	partial 151:20	12:6	plant 11:7 51:1
Overruled 54:23	191:20 194:6,8	154:6 161:6	person 86:11	95:20 96:2,8
79:8 124:9	194:9,9,24	particle 225:12	149:18 248:15	96:21,22 97:5
135:21 144:10	199:10,12	225:13,13	personal 93:6	97:7 155:21
144:24 179:5	203:19 204:6	particular	256:11	plants 134:23
181:1 185:12	204:13 206:18	127:23	perspective	177:23
203:5	207:7,20,21	particularly	237:22	plastic 44:7 94:2
oversight 74:8	208:18 209:10	247:24	petition 189:8	96:24 133:9
owner 213:9	210:3 213:5	parties 6:1	pH 189:4	151:19,21
216:14	218:16,17,18	pass 122:6	phase 32:3,3,4	159:17 161:5,7
oxidation 10:15	229:3 230:12	paths 12:5,6	228:18	162:5,8,12,15
188:20 225:10	232:24 235:20	Patrick 16:18	Phone 256:22	162:21
	235:23 240:23	30:8 74:15,23	photo 162:1,18	please 8:17
	240:24 241:23	125:18 181:6,7	photograph	45:15 71:5
P	pages 7:22 85:12	Patrick's 43:13	111:3 163:17	102:5 103:9
P 2:1,1 22:4,5	95:13 127:10	Paul 22:6	163:18 243:6	110:22 132:6
package 102:13	127:12 198:14	pause 16:21	photographs	177:8 188:13
102:18,20	234:2	47:21 52:13	141:4,5 143:9	199:19 201:16
103:13	paper 18:2	PCB 1:5 5:9	163:10	217:13 219:2
packages 102:17	papers 243:19	PDF 53:11	physical 34:16	223:18 229:12
packet 7:24	paragraph	pending 248:13	picked 236:10	237:5
28:21 164:3,7	63:22 64:14,21	248:17,19	picture 90:17	plot 11:10
165:6	64:24 93:14	Pennsylvania	piecemeal 21:4	226:11 242:5,8
page 4:3 6:11,12	151:16 160:24	88:7,8	pile 202:11	242:21,23
7:24 8:3 17:1	169:22 195:8	percent 86:23	piles 200:3,19	plots 228:3
22:7,11 24:16	214:23 218:18	239:21	pipe 107:8	plotted 226:9
26:23,24 33:1	parameter	perfectly 7:9	pipes 108:5,21	242:2
33:1,7,8 35:13	185:6	Performance	pits 200:2	plume 211:23
35:22,24 38:6	parameters	170:7	place 38:17	plus 68:1 93:8
43:11,18 45:16	26:17 183:4	performed	62:18 72:9	171:11
45:16 47:23	185:8 186:10	60:22 215:1	172:18 193:6	point 18:12 32:2
48:1 52:1,22	206:19 230:24	216:12	216:12	34:21 51:20
56:19,20 62:7	239:13	performs 131:24	placed 25:8	56:18,18,23
64:15 81:20,21	pardon 13:2	22:15 23:24	45:11 46:18	61:15 78:21
93:13 95:12	41:4	39:9 44:18	96:23 105:22	98:16 111:16
100:6,9 102:16	parenthesis	47:10 177:19	149:4 151:19	121:2 122:12
110:10,10	151:24	periodic 250:6	151:21 159:17	123:16,24
127:8,16	part 11:9 12:11	periods 115:6	161:5,7 162:12	127:20 162:7
129:15 131:4	12:12,20 13:13	permissible	171:14 172:18	211:8 220:3
138:21 139:6	15:10 21:11	65:23	243:19	235:20
139:14 148:23				

points 123:21 237:20 238:15 238:24 239:3,6 239:7,17,18,19 239:21 252:23	ponds 9:12,13 12:2,3 14:8,12 14:18 15:10,15 16:7,14,19 17:7 21:8,16 22:21 23:12 24:10 26:5,5 29:7,21,24 31:17,23 34:5 40:11,21 41:1 42:21 43:3 44:15,18 45:11 45:12 46:17,20 46:21,23 51:4 51:17,18,24 52:9 58:11 66:24 67:2 68:13 73:3,15 74:6,8 76:5 77:6 88:5 91:1 92:5 93:5,9 96:4,9,20 109:11 111:23 112:19 115:22 118:23 119:20 127:5 128:5,12 128:22,23 129:18,21 131:20 132:1 133:7 134:16 151:18 156:15 161:4 165:12 172:8 175:8 190:2 197:13 198:1,17 202:10,13,13 218:24	181:18 possibilities 215:7 possibility 181:15 182:4 253:7 possible 74:5 183:13 231:15 possibly 25:22 38:11 64:7 99:4 131:9 211:24 post-hearing 70:13 potable 181:5,8 potential 26:6 46:10 47:1 74:9 130:20,22 162:14 174:1 189:16,22 potentiometric 12:6 Powder 178:3 power 11:7 130:4 134:22 Powerton 37:1 51:7 99:9 115:13,13 134:20 135:12 176:16 203:14 204:11 221:8 230:17 234:17 234:19 238:17 238:21 poz-o-pac 42:22 76:18 99:2,6 99:10 109:12 109:15,17 111:8,24 115:23 149:4 151:20,22 152:5 159:18 161:6,8 162:6 162:12,15,21 162:23 163:1,4 163:9,12,23 166:2 168:7,8	168:17,20,24 169:8 170:16 170:21,22 PPL 130:5 practice 57:16 129:12 133:10 134:6 200:4 227:17 practices 132:4 132:11 133:2,4 133:12,19 135:7 Prairie 1:4 5:6 pre-constructi... 169:5 precedes 230:8 predates 176:7 prefer 101:1 Prejudicial 58:24 preliminary 75:2,5 preparation 103:20,23 prepare 84:19 84:20 86:6 232:7 233:12 233:13 prepared 84:13 84:17 102:17 138:1 preparing 46:5 84:11,21 154:7 154:8 present 10:15 26:13 presented 241:2 241:14 243:1 244:23 preserve 70:12 pressures 77:3 presume 84:11 pretty 32:13 83:7 165:14 173:1,11 226:2 prevent 76:23 99:2 109:7	previous 57:2,2 previously 6:14 110:2 primarily 61:13 64:7 96:3 Prime 17:7 printing 6:11 prior 47:8 80:15 96:19 145:23 164:14 180:15 188:3 198:1 213:8 priority 184:1 probability 62:16,19 probably 36:23 52:23 64:5 88:15 96:20 197:15 225:16 227:19 232:21 problem 33:14 62:21 118:21 143:11 144:7 145:8 146:22 149:14 150:11 150:16 153:23 169:11 236:14 problems 31:3 64:6 97:4,7 143:1 174:1 procedure 56:24 56:24 57:10,11 procedures 61:9 proceed 8:24 10:6 53:21 54:23 62:11 80:11 118:19 246:2 proceeding 65:24 221:5 proceedings 1:11 49:19 59:9 71:15 153:4 220:19 220:24 254:14 256:7,9 process 86:8,10
pond-specific 92:14	poor 132:4,11 133:2,4,12,18 134:6 135:5 175:9 176:11 189:2 portion 12:11 20:14,21 portions 215:1 posit 113:4,5 positively			

86:16 133:8	125:18 126:12	89:5 232:13	34:1 109:1	reads 134:13
172:9 177:12	134:13 136:5	quarries 200:3	quite 141:13	ready 223:18
processes 178:6	136:13 139:1	200:20	142:2 179:11	real 149:14
produce 48:15	147:2 154:6	quarter 36:13	quote 75:6 89:2	realistic 242:1
153:13	155:16 156:6	61:18,19 136:7	157:5 159:17	realized 73:22
produced 57:13	157:19 159:22	203:14 221:7	175:4,10	really 71:24
57:14 110:2	165:8 167:14	237:24 238:1	184:14 215:4,7	119:17 128:21
214:5	177:2 184:9	quarterly 115:3	237:10	157:14 168:12
professional	243:6	115:4 120:11	quoted 157:20	225:8 244:3
86:18 87:8	providing 155:5	120:15,20	quoting 156:11	reason 64:4
163:21,22	155:6	204:10 221:6	156:12	79:23 93:4,8
166:19 227:17	provision	235:15,15		125:4 137:6
255:3	192:11	quarters 39:24	R	218:22
program 87:12	proxy 123:2	74:24 195:3	R 2:1 9:2 71:22	reasonable
236:12	published 54:4	206:13,22	158:16	36:23,24
project 2:9 90:3	pull 203:9	207:2,8,16,22	Race 16:6 30:10	reasons 29:10
90:5,17,20	218:11	208:8,19,23	30:23 74:16	218:22
projects 128:6	pulled 93:14	209:7,13,17,20	radius 181:8	Rebecca 132:13
proof 59:2,3	218:10	209:23 210:4,9	rail 205:1	rebuilt 198:22
69:15,22 70:5	punishing 237:1	210:17 250:3	rain 33:16	rebut 50:13
70:23 71:1	purchased 72:16	question 75:14	rainwater 38:21	rebuttal 49:2
properties 34:16	purpose 108:24	77:21 80:3,6	38:22	60:14 61:7
34:18	117:1 171:21	80:11 83:22	raise 8:18	81:6,8,12
property 87:11	216:22	94:7 117:1	raised 135:17	138:1,6 140:11
211:10,18	purposes 106:2	135:10 142:4	149:8	154:5 155:24
212:5,13,16	200:1	145:11 147:18	ramp 132:23	185:24 186:4,5
213:11 215:2	put 9:7 16:12	149:22 174:6	range 22:23	186:8
215:10,12,16	67:22 172:8	176:14 179:3	23:3,6,7 149:3	rebutted 51:11
215:17,20,24	193:10 232:17	180:23 181:21	242:1	recall 18:11
216:1,15,16	235:18 236:12	188:12,13	ranges 23:2	19:23,24 21:6
217:5,11,14,15	237:21 240:21	190:20 191:7	151:1	45:20 72:7
217:16,16,18	243:21	197:17,18,21	rapid 57:4	73:2 76:6
217:22 218:1	putting 216:12	201:18,20	rarely 178:11	77:11 81:13
218:21 220:1		202:4 226:19	rating 123:15	88:7 91:13,15
proposal 192:7	Q	226:23 227:24	reaches 217:14	91:16 92:5
194:13	qualify 80:10	229:8 237:5	read 19:8 31:7	93:17 109:15
proposed 247:5	84:2 111:15	246:17 248:13	58:7 67:15	129:6 131:23
protect 168:4	quality 10:23	248:16,19	77:19 88:3	138:7,12
protection 106:4	26:16 27:6	questioning	98:15 102:15	140:16 141:1
protects 109:4	28:7,11,16	235:2	103:18 149:5	144:8,13,17
provide 6:1 49:4	35:3 38:2	questions 48:14	194:21 199:17	146:7,9 148:16
57:12 117:9	39:22,23 40:14	49:11,13 71:3	199:18,19	154:6,19,22
174:19 175:3	40:18 41:6,7	110:19 126:23	reader 242:15	159:19 176:18
245:9	41:21 42:2,5	158:22 176:8	reading 78:10	189:23 199:14
provided 15:1	42:15,18 47:12	193:18,20	78:11 128:14	205:17 212:2,7
60:21 83:6	48:3,4,8,10	199:1 246:19	129:14 151:12	214:11
84:15 110:1	75:12,23 86:7	quickly 20:5	200:6 202:16	receded 39:6

receive 200:3	139:2	125:20	137:1 155:15	7:21,23 27:9
received 7:2,5	redirect 102:4	regarding 9:10	224:24 225:6,7	replacement
139:21 158:5	111:15 117:15	9:23 10:10,21	relying 77:22	7:11 102:14
200:24	135:19 157:1	12:22 14:4	233:17	106:20 164:9
receives 199:21	179:23 181:1	47:1 69:22	remained	replacing
200:22	redox 188:16,23	regional 36:21	109:20,21	221:12
receiving 9:14	reduced 39:6	36:21	177:19 178:6	report 1:11
11:3 13:18,20	231:22	Register 231:1	remaining 77:5	11:12,17 14:23
40:20 201:3	reduction	regression 61:6	remedial 38:20	14:24 16:18
recharges 33:19	188:20	64:1,5,23 65:4	51:23 215:5,5	18:6 32:4,9
recognize 96:23	refer 67:15,16	65:6,8 83:2	remediation	33:1,2,10
100:14 140:1	95:2 103:4	regs 119:23,24	87:12 215:3	43:14 47:14
158:7 175:18	192:22 240:19	regulations	remedy 50:11	49:2,3,23 50:5
recollection	reference 27:1	192:1	remember 6:3,6	50:7,9,11,11
25:14 128:10	28:3 31:10	regulators	16:10 21:15	50:13,16,18
214:1	56:21 63:3	186:12	42:9 66:17	52:2 56:19
recommend	102:20 117:10	regulatory	74:16,20 78:12	57:18 59:23
62:13 63:2	135:14 147:5	198:1	80:20 88:2	60:14,18,20
recommendati...	149:16 150:4	rehabilitate	97:3,19 98:7,8	66:22 72:13,18
62:6	160:10	102:4	99:11 100:17	73:17,20 81:6
recommended	referenced 7:10	related 50:9	101:20 109:16	81:12 82:2,2
61:22 185:21	152:9 165:22	61:1 69:8	114:7,9 115:15	82:13 86:7
recommends	223:21	111:11 211:20	116:18 127:4	91:20,22,22
63:7	references 15:5	230:21,23	140:20 141:8	92:24,24 93:3
reconsideration	63:6 138:19,22	232:19	146:12 150:14	93:10,11,12,13
189:9	139:3 143:3,6	relating 199:6	152:16 158:17	93:15 94:5,14
reconstruction	144:6 149:12	relation 51:17	167:11 168:7	94:17 97:21
175:6	149:17,19	relationship	175:11 177:23	98:3 114:9
record 5:12 6:23	186:14,21	10:21	177:24 179:22	120:10 122:23
7:9,20 10:4	187:9 231:5	relative 44:15	184:11 211:7	123:1 125:15
27:18,20,22	Referencing	67:11	212:20 221:5	125:19 126:7
49:7,14,21	199:9	release 57:8	252:18,21	126:17 128:15
52:17 59:6,11	referred 94:4	192:4	remind 134:11	128:16,18
59:13,22 60:1	170:4	relevant 198:13	removal 131:24	137:10,11,20
65:17 66:3	referring 17:2	relied 84:23	134:14 151:21	137:20,21
70:3,11 71:12	55:19 105:1	85:4,9 126:16	161:7 192:18	138:2,6,13,16
71:17 113:1	142:9 160:2	154:17 155:16	removed 15:4	138:19 139:19
135:20 152:24	202:8 211:22	232:8,10	109:18 168:8	139:23 140:5,8
153:6,20 204:9	224:6 229:20	233:14,20,22	184:22 185:5	140:11,18,23
214:14 220:16	refers 31:23	relined 14:19	192:17	141:19,20,23
221:2 244:9	138:16	15:2,15,17	repaired 173:2	142:5,11 143:1
254:10,16	reflect 69:14	16:9 73:15,18	rephrase 133:15	143:2,4,6,13
recorded 23:24	refocus 124:4	112:19 151:18	190:23 201:16	143:19,24
rectangle 13:19	refresh 113:18	161:4 198:17	237:6	145:5,6,16
13:24	128:9 177:8	relining 16:4	replace 6:13,18	146:1 148:4,20
red 12:8 54:7	213:24	199:6	221:10	148:23 149:1,2
55:20 138:24	regard 19:20	rely 70:9,15	replaced 7:1,4	149:7,13,23,24

150:2,3,17,22 150:24 151:5 151:11,13 154:4,5,15,17 154:17 155:1 155:11,24 156:4,5,11 157:18 159:20 160:15,15,16 160:18 162:11 167:8,14 169:12,20,21 171:22 175:11 176:15 185:18 185:24 186:1,5 186:8,9 187:8 203:15 204:10 206:11 218:9 218:12,17 219:15 220:11 220:14 223:22 224:2,8 229:3 229:4 reported 3:3 23:11 43:8 256:6 Reporter 41:15 73:9 102:6 118:13 174:5 193:17,21 247:20 256:6 reports 14:11 48:16 60:1 96:2,5,6 126:4 128:1 135:24 136:2,19,22 137:1,7,8 140:15 147:7 158:6 159:5 167:4 181:6 220:8 representative 48:11 57:12 120:16 represents 119:17 172:11 227:19	request 153:12 154:14 155:10 155:23 156:23 requesting 158:23 requests 154:9 required 231:8 231:16 requirements 120:5 191:22 requires 86:10 199:4 231:2 reread 176:13 resolution 18:11 respect 142:15 respondent 1:9 3:1 56:12 response 81:12 120:14 153:12 154:6 155:4 156:6,10 159:15 161:14 214:17 responses 50:8 154:9 responsibility 162:24 rest 46:14,15 85:13 233:21 240:22 restate 166:23 201:18 restrictions 196:1 result 52:9 58:11 60:15,22 156:14,16 182:19 189:1 219:9 226:11 229:5 230:2 239:20 results 27:4,8 28:5 58:9 208:3 210:17 221:7 235:10 236:1,20 237:10	retirement 175:6 176:12 review 26:16 35:2 44:1 46:4 86:16 89:24 90:16 110:24 129:17,20,24 159:9 165:9,19 168:23 210:16 reviewed 44:14 78:5 84:22,23 85:4 89:14,20 95:18 96:6 101:8 102:9 162:20 232:10 233:16 reviewing 90:15 111:2 reviews 86:12 Rich 123:18 Richard 30:8 31:7 63:4 right 8:17,18 12:3 15:18 20:8 24:24 29:9,19 30:1 31:3 32:5 38:15 39:7 54:6 63:12,17 67:6,7 68:18 73:6 80:1 82:1 82:21 93:18 97:2 100:22,24 104:8 105:19 106:6 110:15 117:24 118:1 121:3 134:18 137:2 138:3,17 140:12 147:2 148:8 150:17 153:6 154:10 157:9,10,24 161:11 162:8 164:24 166:17 167:23 170:23 171:3,15 175:11 177:9	183:12 197:3 197:22 200:23 206:5 212:14 216:10,11 218:16 220:2 223:12 224:7 224:19,22 226:9,10 228:22 234:17 236:9 239:3,8 239:14 241:7,9 242:12,14,19 249:3,10,22 250:2,10 254:5 right-hand 67:14 184:20 191:21 rights 70:12 riprap 105:18 105:19,22 106:1 107:1,11 107:24 risen 40:1 115:5 115:6 rises 122:5 rising 61:14 risk 185:1 187:24 194:17 195:18 risks 192:3 194:14,16 195:18 river 29:12 31:24 32:8,11 32:11,23 33:18 33:23 34:1,6,8 41:1,23 108:17 115:4 120:14 120:23 121:5 121:11,16 122:2,12,21,22 123:7,19 124:13,22 125:1 178:3 rivers 1:4 5:6 33:15,16 123:10	Road 2:3 rock 86:24 rocks 168:6 Room 1:14 rough 162:23 163:4,9 168:10 168:15 roughly 7:22 14:19,20 roughness 168:7 rounds 238:3,8 238:13,18 239:6 rubble 45:24 Ruining 1:5 5:7 rule 24:4,8 26:7 47:2 184:10,13 185:1 186:15 187:1,1,2,22 188:1 189:7,9 190:11 191:23 192:9 195:15 197:2,12,14,16 201:24 202:17 202:20 ruled 70:18 rulemaking 185:20 rules 61:4 137:4 189:13 190:12 190:14 193:13 196:9,21 197:5 198:2 199:9 231:1,9,10 ruling 19:15 54:23 58:1 70:21,21 Run 88:6 running 134:16 Russ 2:10 4:4 5:14,15,16 7:19 8:12,15 8:24 9:1,3 10:3 10:6,7,9 15:13 15:24 16:2 17:24 18:1,20 18:23 19:1,3,9
--	---	--	--	--

19:10,13,16,24	167:23 174:22	76:21,23	242:22 243:5	147:6 215:3
20:9,13,20	178:21 179:1	107:12,15	246:8,12	sections 67:7,9
21:2,5 22:2,4,6	179:14,18,19	108:8 112:11	Schroeder 170:2	104:6 105:8
22:10 23:15,16	180:19,23	116:1 172:18	170:24 171:1,9	106:14,14,20
23:20 24:14,15	184:5 185:7	200:2 204:19	171:15,18	see 12:4 13:1,8
24:19,20 27:12	188:7 190:17	206:4	scientific 160:11	19:6 21:21
27:15 28:1	190:19,20	sat 132:15	scoop 128:5	29:13 32:16,18
31:5 33:4,6,8,9	191:2,3,6,9	satisfied 19:5	scope 58:23	34:21 38:8
35:1,17,18,23	197:11 201:9	saw 16:17 21:17	screen 9:7 11:19	43:16,21 56:22
36:4 42:7	201:11,12	36:24 96:8	18:24 19:6	56:23 81:20
48:22 49:6,9	202:3 203:2,11	97:14 128:1	28:21 38:8	82:12,15 96:2
49:14,21,22	204:13 212:24	154:9 155:1	82:3 95:13	97:18 102:18
50:4 52:24	220:6,10,14	169:4 181:7	111:3 245:11	103:15 105:19
53:4,7,21,22	221:2,4,14,16	saying 28:3	245:13	106:21 107:1,3
53:23 54:19	221:20,24	51:12 79:23	screens 219:10	111:22,24
55:1,14,17	222:4,6,16	84:3 97:3	219:14 229:6	112:21 117:18
56:13,14 57:24	223:4,8,15	101:22 104:12	sea 67:17 68:1	118:1,6 127:13
58:18 59:4,12	237:3 243:9,13	123:12 124:24	seams 172:14,24	128:7,8 131:10
59:15,18,21	243:23 244:13	131:12 134:19	173:21	139:2,4,8,9
60:9 62:9	245:11,13,19	146:7,10,12	search 236:11	147:11 151:23
63:21 65:16,19	245:24 246:2	157:22 159:20	seasonal 61:11	152:1 158:10
66:5,12,16	246:15 251:4	171:23 180:21	61:12 64:7	158:19 163:16
68:15 69:3,7	252:13	183:21,23,24	second 15:22	164:14 168:22
69:11 71:2	Russ's 223:2	187:13 195:24	16:21 35:24	169:4 170:18
73:15 79:5		223:24 224:10	36:12 47:21	176:8 177:1
80:3,6 98:17	S	225:14 226:5,7	49:15 52:14	182:1,13 185:2
101:12,14,15	S 2:1 4:8 71:22	236:24 238:19	64:14,20,21	187:7,11,19
101:21,24	71:22	248:10	104:4,5 105:5	190:23 195:11
102:3 110:11	sad 255:1	says 12:9 16:6	105:7 106:17	204:22 205:1
110:13 111:1	saith 8:22	30:13 31:8	107:19 110:10	219:10 224:1,5
111:10 113:21	salt 199:23,24	36:5 52:2,6	111:21,22	228:24 230:13
114:5 116:11	sample 111:4	54:7,8,8 55:21	121:2 136:7	230:19 245:3
116:21 117:8	209:12	56:1 57:3	169:22 191:7	245:10 247:5,8
117:16 118:16	sampled 235:13	63:24 67:9,14	194:8,10	252:10 253:5
119:14 124:1,6	235:17 236:19	68:11 85:16	203:14 214:23	255:1
125:7 133:13	237:9,13 239:1	92:24 95:14	218:11 223:18	seeing 18:12
133:20 135:9	239:2,6	100:21 127:17	238:1 254:11	27:9 29:20
137:13,16,16	samples 62:22	148:23 156:10	secondary 99:10	66:17 158:17
137:17 143:21	115:4,10	157:9 160:3	100:2 101:9	214:11 250:23
144:3,15,21,22	207:13 208:11	166:13,15	102:10,14	seen 15:20 17:14
145:10,18,21	209:3 250:9,11	168:17 186:9	106:19 107:23	30:11 50:18
145:22,23	sampling 115:7	186:10 188:2	108:14	78:1 91:9
150:19,20,21	206:13 236:16	219:7,15	section 17:6,7,8	153:14 165:6
152:13 156:22	237:11 238:3,9	228:22	35:10,11 43:16	165:12 198:9
158:10,13	250:9	scale 117:18,20	52:6 64:11	198:12,15
166:22 167:1,9	sand 25:10,10	226:4 241:19	106:24 107:7	199:5 214:6,13
167:11,16,20	25:10 45:23	242:3,9,14,16	107:19 111:23	219:16,18

sends 175:17	sf@nijmanfra...	204:21 206:12	57:22 58:13	situations
senior 86:11	2:23	215:20 217:6	single 97:13	196:16 234:5
sense 108:20	shake 54:5	228:11 239:19	132:19	six 17:12 103:12
126:11 160:11	56:24	side 25:1 29:11	sir 75:24 98:14	107:8 108:5,21
192:20	shallow 29:9	29:13 32:20,21	152:20 163:7	112:15 125:10
sensitive 188:23	shape 173:1	32:21 38:13,15	169:22 179:24	154:12 236:2
sent 109:23	sheet 38:14,15	39:12 40:10,19	188:6 193:4	253:22
139:23 147:4	54:21 103:7,11	40:24 41:2	198:13 199:8	sixth 240:24
sentence 64:18	sheets 105:3	43:17 44:11	200:6,10 201:1	skewed 63:1
65:1 150:1,1	shoot 147:13	45:22 67:14	226:18,20,23	skip 35:13 249:7
151:17 152:7	short 21:13	117:19 118:2	229:12 233:9	skipped 249:4
161:3 191:21	shorthand 256:5	151:21 159:17	255:6	slag 12:19,22
separately	256:7	161:8 184:20	sit 46:22	13:21 72:7
147:22	show 25:16 36:9	191:21 206:8	site 9:5,10 10:18	slam@enviro...
September	41:3 47:16	sides 105:22	10:22 11:4,6,9	2:13
91:17,24 176:2	51:15 54:3,9	107:24	12:10,12,17	slide 42:6
214:15	67:1,4 79:18	Sierra 1:3 2:14	14:13 22:20	111:22,22
series 21:13	90:5 102:12	5:5 89:3,8	28:23 29:1,2,9	115:16 246:4
36:11 38:13	134:10 140:4	signature	29:12,17,18	slight 246:10,14
51:14 136:19	147:9 153:11	158:11 256:13	32:2,6,12	slightly 37:23
230:16,17	162:5 165:16	signed 150:3	34:22,23 44:13	41:20 113:3,10
serve 134:22	165:17 169:6,7	158:9,15	46:14,15 47:2	slope 65:5,8,14
serves 134:23,24	172:24 194:8	significant	57:17,19,23	151:22 159:18
service 95:1	212:22 214:4	16:16 23:9,10	58:13 64:7	161:8
97:23 98:9	217:9 221:24	44:4,5,10 46:8	72:6 87:12	slopes 44:12
set 16:24 74:21	224:17 235:21	46:9	95:20 96:2,6,9	slow 174:8
136:18 141:14	241:22,24	significantly	96:21,22 97:5	small 12:10
254:18	showed 16:18	192:4 194:15	109:24 111:11	smaller 225:13
Setting 21:6	47:18 81:2	signing 158:18	120:17 121:16	smooth 163:13
settling 99:10	120:9 205:4	silty 25:10 45:23	135:10,11	163:14,16,24
101:9 102:14	showing 11:21	similar 14:3	155:21 156:3	166:12
106:19 107:23	36:7 95:18	25:17 36:8	156:15 176:16	snow 33:17
seven 17:12	108:12 111:8	37:19 39:19	178:18 211:19	38:23
41:17 47:10	148:10 164:3,6	42:12 46:15	213:12,16,18	soil 168:19
115:8 120:19	166:1 218:6	84:6 205:11	213:19,19,21	170:15
174:19 175:2	237:8	similarly 115:18	214:2 218:2,24	soils 192:15
236:2	shown 17:1 56:1	191:22	224:8 234:10	sole 57:15 195:8
Seymour 49:3	67:15 116:12	simple 61:6,21	sites 28:19 29:4	solely 237:8
50:8,22 51:8	154:3 178:11	123:6	51:1,3,6 52:8	solid 35:24 54:6
52:7 60:16,21	184:23 187:23	simply 6:10	61:13 63:13,18	57:5,6,9,13
61:21 65:11,12	224:19,21	38:19 70:13	73:1 135:13,16	Somebody
81:11,15 83:19	shows 12:2,2	77:21 80:13	156:16 157:10	232:16
83:24 156:1,19	17:5,6,9 24:22	97:15 111:8	181:9 185:19	somewhat 40:16
157:20	37:1 38:12	192:15,16	192:13 200:11	sorry 6:4 7:8
Seymour's	39:1,13 43:19	201:5 235:12	211:12 239:9	15:23,24 19:3
50:14 156:4,5	45:17,22 67:5	245:8	situation 97:19	19:19 20:9
156:11 157:5	103:11 107:19	simulate 57:17	142:23	22:8,17 24:13

24:17 27:8	39:13 40:8,9	40:14,19 41:6	35:22,23 71:18	204:11 214:18
29:24 32:17	42:10,10,11,11	41:7,9,21 42:2	95:14 127:16	stations 72:16
33:4 42:23	107:18 217:17	42:5,18 48:4,5	195:5,8 206:17	177:18 178:7
48:24 49:9	southeast 12:13	48:8,10 54:5,9	213:6 214:24	178:24 179:16
52:13 64:20	40:8 45:22	55:5,7,10,13	starts 22:7 35:11	180:5,11 181:5
65:19 69:4	southwest 30:2	55:22 56:2,21	64:22 161:3	189:17 201:7
80:5 81:7	space 217:21	56:21 57:3	state 13:13	statistical 61:4
92:18 95:16	spatially 51:10	65:13 80:14,22	36:19 37:12	61:10,23 62:2
100:8 103:21	51:15	83:3 129:11	40:13 41:9,21	62:15 63:7
127:13 132:7	speak 63:15	197:6,9,13	42:17 52:12	83:15 241:11
137:16,16,19	73:11 118:12	206:23 207:7	87:9 117:13	status 254:21
138:23 151:11	132:6 219:2	207:10,17,24	143:14 163:22	stayed 19:15
153:19,22	speaking 244:6	208:7,9,15,21	167:4 168:2	stenographic
158:13 164:6	specific 12:15	209:1,8,14,18	176:12,24	256:10
166:22 167:7	57:17,19 58:13	210:1,6,10,14	182:17 211:19	Steven 3:4 256:5
167:16 172:19	77:19 91:16	226:15 232:13	224:24 225:6	256:20
183:16 184:17	92:13,19 97:22	235:6,11 236:4	227:12,14	stipulated 52:12
186:3 190:19	119:9 142:22	236:7,21	256:1	stipulates 52:12
191:13 194:7	150:4 178:17	237:21 239:20	stated 113:8	stone 107:5,12
195:1,23,24	193:6	242:21 243:7	155:11 156:1	108:2,6
204:1 213:1	specifically 97:1	243:20 246:7	156:19 182:8	stop 20:16,18
214:8 216:10	97:2 100:5	246:11 247:9	195:18 211:8	240:3
219:3 221:16	109:7 128:23	247:13,18	statement 94:1	storage 12:19
222:2,3 225:20	138:15 142:9	248:22,23	126:20 141:6	13:22 72:7,17
227:21 229:12	198:5 229:19	249:2,15 250:2	150:5 152:7	store 122:14,15
230:13 234:20	speculation	250:3,19,22,24	156:12 157:15	stored 52:9
243:12 244:13	30:22	251:3,14,18,22	157:18 159:5	58:11 156:14
245:19 246:16	spell 34:12	252:1,5,9,24	159:23 160:6	straight 242:5
248:11,15	spent 86:21,23	253:11,12,17	161:14 162:11	stream 122:5
sort 96:17	spoke 74:13	253:18	163:4 171:7	123:2,3 125:2
sound 238:20	spots 173:2	standards 13:14	175:4,14	125:3
239:3,8 254:5	spreadsheet	41:13 42:15	176:10 189:24	Street 2:15,21
source 11:7	236:6	75:12,23 77:11	192:22 194:13	256:21
12:23 13:3	spreadsheets	79:3,12,15	194:20 195:6	strike 69:10,11
14:8,15 26:7	155:8 245:5	197:22 198:1	196:12 218:17	157:7
26:21 40:20	SS 256:2	210:20 230:11	219:11 224:1	strong 30:14
46:10,10 47:2	stack 16:24	234:6,24	229:3	31:11
74:9 177:11,17	17:21 21:22	235:18 247:12	statements	struck 69:7
181:18 189:17	24:14 30:5	stands 124:7	140:24 141:5	structural 73:12
sources 12:16,18	43:11 203:17	216:8	states 88:16	190:4 200:14
25:22 26:6	stage 122:3	start 40:23	156:23 184:21	200:15,16
44:23 45:1,8	stand 5:13 87:24	103:5 129:15	197:21	structures
45:10 47:1	245:13	220:11 252:9	station 22:14	151:23 159:19
51:4 74:5	standard 27:6,7	started 7:21	23:12 43:15	161:9
156:2 189:22	28:7,11,17	16:8 85:15	102:10 121:4	subbase 169:7
south 2:21 12:11	37:13,16 38:2	180:16	121:22 122:24	subgrade 103:20
12:12 39:11,11	39:18,23 40:7	starting 20:17	155:12,20	103:22 104:3,6

105:4,8,14	sulfates 242:3	96:19 101:6	sworn 8:22	59:3 66:7 71:7
106:13,20	summarized	105:12 110:12	158:15 159:14	81:16 99:19
107:23 140:4	119:11	113:1 116:12	161:13 175:16	100:4 103:4
166:5,10	summary 8:2	118:22 119:8	SYLVIA 2:10	106:5 109:22
subject 195:15	22:13 27:24	119:16 130:12	symbol 53:12	110:21 113:2
submitted 66:22	48:1 53:13	138:18,22	105:18	127:7 151:8
138:5,13	56:20 58:23	142:2 153:16	synthetic 96:14	157:1 162:23
176:24	84:16 233:18	157:4,13 160:1	96:22	172:17 220:21
subpart 200:1	234:1 235:2	160:13 162:24	system 88:19	239:16
substantial	sump 106:7,9	166:8,9 167:2	106:15 108:13	taken 9:6 43:21
33:21	super 155:21	170:15 174:13	109:1,7 121:5	49:17 55:24
substantially	superceded 54:7	178:8 181:17	121:7	56:16,17 59:7
32:10 39:2	54:8	190:13 196:3	systems 29:5,5	70:24 71:13
113:11	superhigh 32:14	198:3,15 206:3	172:3 198:6	87:11 95:1
suggest 30:15	supplemental	235:22 242:13		97:23 98:9
suggesting 31:12	60:19 138:6,13	245:17,20	T	111:4 115:2
76:14 115:9	138:15 139:22	246:21	T 2:20 4:8 9:2,2	120:12 153:2
suitable 65:3	140:5,8 167:7	surface 11:24	71:22	220:17,22
Suite 2:7,11,16	167:13,15	16:20 21:10	T-A-L-E-N 89:6	238:18,18
2:21 256:21	169:20,21	25:7 33:14,15	T-test 65:4	243:19 254:12
sulfate 9:19,21	186:9 214:16	33:20 40:22	tab 184:14	256:11
9:24 10:11,12	218:8,12	46:17 51:5	191:19	Talen 89:5,11
10:14 11:4	support 36:18	97:16 119:19	table 8:2,3 27:1	91:24 92:5
13:11,14 25:19	138:16 139:3	166:5 168:10	27:9,23,24	94:2,12,13,13
26:7 28:14,15	140:24 141:11	168:18,19	28:3 36:3 37:1	94:14,17,17,20
36:6,10,15	142:6,8 143:15	192:5,17	48:1 84:14	94:24 97:11
37:6,13,14	143:18 145:9	194:11,14,16	85:11 96:21	127:17 128:2
38:2,3,14 39:5	145:17 150:4	199:22,24	97:8,15 154:15	130:1,5,18
39:15,19,20,23	152:11 157:15	225:17	154:16 206:12	talk 20:8,11,13
40:15 41:3,10	157:18 158:23	surge 115:17	228:21 229:19	21:19 51:6
41:19 42:2,5	159:16,23	117:2 118:10	233:4,8,13,15	53:8,8 66:6
42:13,16 44:23	161:14 163:3,8	118:15	233:17,18,18	97:21 115:14
45:3,9 47:13	171:2 175:14	surprised 231:5	234:6,6 235:3	129:21 161:24
48:10 75:7	186:17,19	surrounding	235:19 236:13	185:8 196:2
182:9 184:22	supported 141:4	155:12 156:17	237:1,8,19	254:11
185:22 187:5	159:5	157:11	239:19	talked 6:6,8
187:16,17,17	supporting	surveys 172:6	tables 11:16	46:24 64:3
207:15,16	175:4	172:17 173:24	13:7 36:9	72:2,24 73:1
208:14,15	supports 139:11	174:12 181:8	74:14 96:24	82:17 87:2
209:6,7,23,24	171:7	SUSAN 2:20	177:1 206:10	88:6 93:1,15
210:13 225:19	suppose 11:2	Sustained 50:3	230:7 232:4,5	100:16 101:4
233:19 249:9	sure 5:19 18:13	59:1 98:19	232:7 234:1	119:8 130:1
250:8,21,22	18:21 26:12	125:10 145:13	235:11 240:1	140:11,19
251:14,18,21	35:18 38:8	151:3 184:7	240:20 249:8	161:10 175:22
252:5,9,12	42:8 51:10,11	237:5 251:7	tabulated	190:1 196:12
253:1,9,10	52:15 53:5	switch 229:16	232:11	talking 9:5,20
254:2	70:10 74:23	swore 93:21	take 51:20 59:2	13:15 14:9

27:2 50:12	51:12	137:14 138:10	Thanks 16:1	225:12 231:15
66:7 68:3	ten 29:20 37:4,5	145:24 150:22	125:12 167:23	232:6,21
73:15 77:10	37:8 60:15,22	176:9 177:21	174:8 254:11	234:16 242:6
78:9 82:5 94:7	71:11 93:13	184:9 197:11	thick 112:6	247:17 248:9
100:2 109:8	tend 253:8	201:13,18	thing 21:20	249:4,8 252:8
113:22 126:24	tends 96:21	211:8,13	55:20 69:3	252:14 254:9
142:22 144:5	term 31:8	testing 60:15,22	84:9 127:19	thinking 64:11
147:6 155:9	188:16 190:7	63:7 81:8,10	128:15 165:17	108:16 151:8
169:24 182:6	216:3	178:11	222:16 241:18	211:1 254:22
183:16 189:6	terms 250:8	tests 61:2,3,5,10	things 31:8 61:7	third 57:16
192:23 196:8	test 52:3,10,11	61:22,23,23	64:9 70:9,15	110:10 153:12
199:14 218:20	53:5 54:5,10	62:2,4,15 63:2	72:1 83:8	184:19 191:20
219:21,22	57:1,7,22 58:7	63:8 64:17	90:12 131:7,15	third-party
talks 63:22	58:12 61:21	77:16 78:2	133:4 138:24	163:21
200:19	62:13,14,14	79:18	159:10 177:6	thirdly 57:16
Tannery 10:21	63:3,5,9,12,17	text 11:17	196:2 202:15	Thirty-three
11:4,6 12:10	65:5,7,8 77:14	textbook 63:5	think 5:12,14	127:10
211:9,19 212:4	77:23 79:19	thank 5:21 7:17	14:16 16:21,22	Thompson 1:14
212:13,16	82:24 83:3	8:9,10,12,23	20:23,24 22:18	thought 73:17
213:9,12,16,18	171:19 172:23	9:1 15:18	25:21 30:19	82:5 95:17
213:21 214:2	173:5 178:14	16:13 26:4,15	31:22 50:12,22	132:16 150:9
215:12 216:15	testified 30:23	28:18 31:4	51:7,15 53:17	150:11 179:11
217:11,14,16	98:21 99:8	35:2,9 44:22	58:4 67:17	thoughts 71:8
218:1,21,23	100:1 113:16	48:13 53:22	69:23 70:20	thousand 122:4
219:24	114:8 116:18	58:18 59:15	73:6 80:20	three 23:7 42:10
TDS 26:18	116:19 119:4	60:3 63:19	81:17 82:21	62:8 64:13
211:24	162:18 202:8	66:2,12,14	86:21 93:4	81:21 96:3,6,9
tear 132:20,23	202:19 205:14	69:1 70:17	96:8,16 97:20	109:11 128:22
tears 91:8 127:2	206:20 233:14	71:2,12,20	109:10 111:10	131:4 136:1
128:19 130:22	233:16,24	76:4 95:5,8	111:12 126:13	151:18 155:11
132:17	251:11 253:15	100:11 102:24	130:19 133:5	161:4 182:13
technical 36:18	testify 20:21	110:6 111:16	134:12 135:12	182:15,18
186:17	55:12 211:17	114:2,4 117:16	141:8 145:2,15	186:20,21
technique 64:23	testifying 55:7	126:22 144:11	146:5 147:14	195:2 207:1
tell 22:23 26:19	72:5 114:9	152:20 153:1,9	157:20,21	209:20 218:17
93:21 95:18	146:2 161:22	160:21 164:10	167:12 168:17	218:22 229:3
147:22 148:1	205:17	165:2 167:1	169:1,8 172:24	233:19 234:11
162:1 168:19	testimony 14:6	169:19 176:15	178:21 179:11	236:2 253:23
171:1 205:15	19:20 58:24	183:2 193:15	181:7 183:11	254:4
212:12 218:9	59:13 69:8,12	194:4 203:6	183:14,24	time 12:1 21:13
224:24 225:20	69:19,21 70:3	213:1 219:2	185:18 188:4,7	23:24 31:15
226:4 232:3	70:8,11,14,22	221:4 223:2,15	189:20 194:2	36:11 38:12
telling 251:11	77:18,19 79:13	225:5 227:16	196:6,9,19	39:9,15,21
temporal 60:15	79:15 80:21	229:16 245:18	200:17 202:16	40:12 42:4,16
60:15,22 65:15	81:5 92:7	245:21 246:1	205:3,6 211:16	43:20 51:14
81:8,10	99:11 132:12	246:22 250:18	212:19,21,23	71:6 73:11
temporally 51:9	136:12,14	255:2,4,5,6,7	213:19,20	78:5 87:4

115:6 126:9	247:10	203:9 220:10	164:9 186:1,8	163:14 170:10
131:4,7 133:5	topic 124:5	237:21	193:18,20	171:23 179:3,7
152:22 191:11	total 232:11,12	trying 10:4	206:23 207:12	180:15 186:18
196:1 197:19	239:17,19	30:20 79:1	208:2,11 209:3	186:24 190:13
204:1 206:22	253:21,22	80:10,13	219:6 228:18	191:15 212:18
225:9 235:16	totaled 230:1	116:20 119:17	236:2 239:1	229:24 236:22
247:2 248:15	totally 18:11	122:16,19	two-page 54:20	237:24 240:17
254:10	244:1	125:5,24	type 36:21 168:9	242:16 243:14
timeframe 16:10	totals 235:3	191:17 244:19	192:6	244:1
times 15:14 28:8	touch 20:6	246:24	types 154:3	understanding
28:12,14,17	traffic 29:15	turn 7:19 11:14	typically 46:22	69:13 81:14
37:4,5,8 48:6,9	train 78:24	16:22,24 17:20	62:18,24 106:3	87:14 112:17
48:10 75:6	transcribed	21:21 22:11	127:22	112:18 234:3
88:3 90:8	256:11	24:10,16 26:23	typo 214:9	understood 61:4
120:11 125:10	transcript 98:10	28:19 30:4		117:24 152:8
179:11 182:12	98:14,14	35:9 43:10	<u>U</u>	152:11 227:6
235:12 236:6	212:23 213:6	45:15 48:23	Uh-huh 131:9	undeveloped
237:2,9 238:9	248:3 256:9	52:1,17 54:12	213:13	155:13
238:13,18	transmittal	60:10 93:12	ultimately 94:19	uneven 140:4
239:1,2,17	164:8	104:7 105:14	239:7	unfortunately
timing 26:11,12	transporting	154:12 165:5	unable 58:23	224:18
211:1	42:24	165:20 169:19	unclear 202:4	unit 45:24
title 103:7,11	treatise 63:5	184:15 185:23	unconsolidated	204:19 206:3,4
104:22 106:18	trend 60:15,22	191:1,20 194:6	29:5,6 43:24	United 88:16
142:11 150:13	61:5,10 63:10	turned 132:7	underdrain	units 192:4,8
titled 148:13	64:16 65:15	turning 15:18	104:3 105:4,14	194:17,19
titles 150:17	241:5,5	32:24 38:5	106:15 108:13	195:13
today 5:9 7:2,5	trial 256:7,10	40:7 219:3	108:24	universally
19:13 81:2	tried 159:3	246:4,9	underground	42:20
83:6 85:5	221:8 243:4	two 15:10 25:22	199:23,24	unlined 88:10
136:11	248:6,6	27:14,15 28:13	underlying	88:12,16
toe 73:8	trouble 82:4	29:15,22 32:3	62:16,19	unloaded
told 27:10 82:21	115:1	32:4 37:11	underneath	172:11
83:7 86:22	true 19:23 65:5	38:2 41:22	44:20	update 136:10
121:23 136:22	87:4 109:6	42:10 48:8,13	understand	uplift 44:8,10
189:21 212:3	120:16 121:3	58:5 62:8 67:7	26:12 29:1	76:6,15,24
243:7 246:5,10	133:17 141:13	67:8 74:4 75:1	65:23 75:13,24	77:2 92:4,8,20
246:13 248:21	155:19 163:12	75:10,10 77:15	78:22 79:21	93:4 94:7,11
251:2,9,10	172:6,13	81:4,21 111:24	81:9 83:22	94:21,24 95:19
253:10,15	178:15 180:3,6	112:24 113:9	85:19 94:6	96:8 97:4,10
tomorrow 173:7	188:22 190:23	118:1 129:18	101:22 116:21	98:22 99:3,14
top 25:7 43:7	200:8 235:9	134:21,23,23	119:16 120:2,3	101:5 109:8
53:12 76:21	256:8	134:24 147:11	122:17,19	125:16,22
105:19 106:23	trust 166:16	147:19 149:2	125:24 126:5	126:19
112:8 116:2,5	truth 93:21	150:1 154:14	145:3 146:23	upstairs 6:21
132:23 151:19	try 122:14 172:5	154:16 155:5	149:21 159:3	upstream 12:3
161:5 162:8	182:24 197:16	159:15 160:4	160:12 162:20	122:8,10,24

URS 63:10	159:6 177:1	245:20	9:11 22:14	weather 61:13
use 18:19 36:16	varying 14:21	wanted 70:10	23:12 28:12,22	225:17,18
50:20 54:10	verify 243:15	84:9 183:14	35:12 51:7	weathers 225:8
63:1,12,17	Vermont 2:11	194:8 221:2	63:10,12 66:23	website 53:5,9
75:19 76:1	version 6:17,21	wants 60:1	72:6 73:14	69:5,16
78:11,17 80:14	7:2,5 8:1 54:11	188:8	74:4 125:14,16	Webster 2:15
80:22 99:21	57:2 68:19	warning 76:21	126:17 155:12	Wednesday 6:9
113:5 123:1,1	80:16 221:9,11	112:14 116:1	155:20 212:10	week 6:6 255:4
135:15 149:16	221:22	172:18	214:18 217:10	weight 53:19
149:17 155:12	versions 5:22	warranted	218:20 224:9	98:23
170:8 171:9	versus 5:8 89:4	173:16	234:17 238:24	welcome 66:14
172:8 178:17	vertical 13:20	warrants 173:19	way 56:10 58:13	213:3 245:23
186:6 187:2	117:22	Washington	113:2 127:14	well-documen...
200:5 202:12	view 251:17	2:12	132:8 134:17	50:21 94:23
216:7 220:5	violated 61:3	wasn't 78:20	138:14 139:1	well-established
uses 79:3,13,15	violation 176:23	94:20 101:17	157:7 172:5	182:17
132:11 135:4	214:17 234:5	126:2 138:11	173:24 180:2	well-known
156:16 157:10	Virginia 88:8	143:5 150:8	195:3 201:13	130:19
USGS 63:6	visual 117:12	152:11 166:18	217:17 219:4	wells 9:22,24
121:22,23	visually 166:4	183:24 192:18	242:21,24	10:11,22,23,24
122:2 124:22	visuals 241:10	197:2 201:3,17	246:7,12 247:9	11:2 13:18,19
usually 65:23	voice 15:7 40:3	233:4	249:15 250:23	13:23 14:1,1
231:17	vs 1:7	waste 54:6 57:5	251:3,4,5	22:14,19,22
utility 89:11,13		57:6,7,9,14	252:10	26:2 28:10,15
utilized 65:5	W	178:12,15	we'll 14:16	29:8,20,22
142:11 165:15	Wacker 2:6	191:24	40:23 71:12	30:19 35:5,7,7
	wait 20:23 21:1	water 5:9 11:7	82:7 113:4	36:16 37:10,13
V	41:15 73:9	11:24 16:20	151:8 163:11	37:18,19,21
vague 118:17	92:18 230:13	21:10 29:15	194:7 238:6	38:2 39:7,10
144:4,22 146:4	248:19	32:9,10,11,22	we're 21:1 27:21	40:10,10,15,19
202:4 251:5	waiting 227:24	33:15,18,20,22	28:18 33:14	40:23,24 41:12
Valdes 14:11	walk 38:6	33:23 38:21	35:22,23 47:23	42:6,20,22
18:5,6 66:22	168:21	54:6 76:13	49:20 50:11	43:22 46:12
valid 61:22	walked 144:14	77:2,5 96:21	59:6,10 61:10	51:17 82:15
65:14	Wannier 2:15	96:23 106:1,9	71:12,16 103:4	181:5 182:6
value 232:11	5:20,21 6:4,8	109:1 119:19	152:24 153:6	205:16,18
236:4,8	6:15,19 7:8,16	121:20 122:5	169:24 182:6	206:2 210:18
values 232:12	want 14:5 42:6	122:14,14	183:16 218:20	210:19 216:19
233:17,19	52:16 54:9	123:2,4,13,20	221:1,12,13	219:9,9,13,17
236:10	56:22 70:13	124:18,19	230:11 236:3	219:19,20,22
vanadium 231:6	72:1 75:24	125:3 172:12	249:24 250:21	220:3 224:1,7
231:8,15	110:21 117:8	173:8 181:16	250:23 253:11	224:11,12,14
variables 9:18	134:9,11	181:19 182:5	254:15,22	224:17 227:4
variations 61:11	135:23 169:2	213:18 232:13	we've 35:12	228:8 229:5,6
varied 113:3	170:23 178:17	waterbodies	36:22 48:16	229:9,14 230:3
various 9:22	182:13 183:22	33:14 51:18	51:2 159:7	230:5 234:7
82:15 140:15	183:23 223:4	Waukegan 9:5	210:18 254:20	235:3,7 238:11

238:17,19,24 239:1,5 252:16 went 130:5 140:17 141:11 142:5 152:3 159:11 162:21 193:9 236:9 241:3,8 243:3 248:8 249:8 weren't 15:3 57:1 113:22 131:8 166:17 185:16 189:12 192:14 200:24 211:20 west 10:22 14:12 17:8 23:12 29:11 32:8,20 32:21 40:24 41:2 42:11 67:8 88:8 106:24,24 217:16,20 256:21 wet 46:2 225:9 white 12:5 Wildlife 89:4 willing 169:3 Wilmette 2:3 wing 164:22 withdraw 237:5 243:23 245:24 witness 4:2 8:21 15:8 22:5 27:14,23 33:5 34:13 36:2 40:4,5 41:17 41:18 55:9,12 56:4 58:6 62:7 62:12 63:16 79:9 110:22 116:17 118:20 119:15 124:2 134:1 145:1 152:18 157:3 158:12 174:23 179:2,6 185:13	202:7 203:21 204:2 220:12 240:12,16 244:7,9 247:22 248:4 252:20 256:13 witness's 58:24 witnessed 132:17 word 75:19 76:1 124:12 129:9 162:13 230:12 251:5 words 28:7 34:20 61:17 65:7 77:19,20 79:16 123:3 172:12 193:8 230:3 236:18 252:15 work 38:20 78:4 85:19,22 86:12 worked 86:1 216:12 working 16:8 80:8 85:16,23 86:24 works 87:19 world 34:19 worse 31:8 wouldn't 34:20 61:21 76:23 83:23 118:24 126:12 133:6 212:15 225:14 242:6 writing 60:18 written 31:16 175:4 wrong 73:23 93:14 94:22 125:20 149:9 196:10 211:11 217:14 219:4 wrote 53:14 65:2 81:15 171:15	Wyoming 178:4 <hr/> X X 4:1,8 9:2 71:22 <hr/> Y yeah 7:8 10:8 23:1,4 27:3 30:1 31:20 32:18 36:5 40:4 50:7 52:7 52:18 58:6 62:9 67:17 69:1,19 80:20 81:19 84:22 95:7 103:18 110:22 122:18 130:12 145:2 146:3,22 168:6 170:23 172:10 173:15 174:7 176:22 178:13 182:7 186:7 188:21 191:16 192:12 198:20 200:15 203:16 205:12 206:9 220:12 227:7 234:16 236:17 245:6 246:18 247:23 year 181:2 255:2 years 14:19 15:16 47:10 78:8 115:8 120:19 163:5 173:17,20,21 yesterday 5:12 9:5,20 16:24 17:22 21:23 30:5 43:11 68:6 83:6 87:2 89:14,20 99:8 100:1,17 114:2 114:4 115:14 119:6 136:1,11	182:8,12 183:2 183:19 184:4 184:10 196:8 197:10,20 205:17 211:7 241:3 247:16 248:9 249:5 yesterday's 7:20 <hr/> Z zero 65:6,9,9 zone 87:15 234:8,9 235:4 zones 234:12,19 234:22,24 zoom 19:17 zoomed 9:7 <hr/> 0 0 242:17,17 252:10 0.15 207:8,10 208:7 0.18 247:17 0.4 242:17 03 15:4,4 04 15:5 05 15:4 084-004675 3:4 256:23 <hr/> 1 1 27:5 28:7,10 28:11,16 35:7 37:15 38:1 39:18,22 40:7 40:18 41:6,12 41:15 42:2,15 48:4,7,9 75:11 85:12 164:13 206:23 207:7 207:10,17,24 208:6,9,15,21 209:1,8,14,18 210:1,6,10,14 210:20 230:11 232:13,24	234:1,2,6,24 235:11,18,23 236:21 237:10 237:20 239:20 242:3,21 243:7 243:20 246:7 246:11 247:9 247:13,18 248:23 249:2 249:15,19 250:19,23 251:3,18,22 252:1,5,23 253:12,17,18 1,164 239:7 1,808 239:19 1:30 152:24 153:7 10 2:21 10:24 81:20 226:1 239:5 249:19 253:8 10,000 122:4 10:55 71:17 100 17:20 66:11 66:12 100.5 4:15 68:17 68:21 69:2 1000 2:11 1004 2:3 101 32:24 11 10:1,24 29:22 29:23 37:18 224:17 238:11 239:21 253:8 253:14,15,22 253:22,23 11/2014 22:15 11:30 254:22 110 28:12 1100 2:11 119 48:10 12 10:24 29:23 30:2 35:8 37:18,21 42:9 109:14,19 111:24 112:11
---	--	--	---	--

224:17 226:8	1999 214:24	176:7 186:13	24E 221:21	34 127:8,16
228:14 230:12	19D 228:21,21	187:9	25 240:11	129:16
236:20	1N 38:16 39:4	2015 49:5 59:23	251-5255 2:22	34158 102:13
120 48:8	41:2 42:23	81:13 82:3	260 203:9	34261 103:6
13 224:18	43:18 45:22	91:17 92:1	260.0 203:10	34263 105:15
239:13,17	76:11	93:3,11 125:15	260.O 204:12	34265 106:13
13-15 1:5 5:9	1S 38:16 39:12	137:12 139:18	263-4453 2:12	34267 102:16
13-15_62387	41:3 42:23,23	141:22 143:13	26th 5:12	35 2:6 28:14
22:8	76:11	145:16 148:20	27 238:3,8,9,13	36 30:4 74:14
13-15_62468	1st 93:11 141:22	149:23 154:4	238:18 239:1,6	3600 2:21
22:9	254:24	155:24 160:15	270 239:6	37 7:22 26:24
1300 2:16		175:11 186:13	270B 22:3	48:1,2 85:12
14 10:24 16:23	2	186:14 197:3	270P 21:22 22:2	232:24 234:2
56:19 148:14	2 25:15,20 41:3	207:9 208:19	22:6	235:23
169:21 224:18	234:1	223:21 224:2	271 5:23 7:4	37-page 7:24
226:2 229:5	20 14:3 15:16	2016 60:16,23	278Q 5:23 7:1	38 131:4
146 213:5	71:11 226:3,5	93:18 136:5,22	27th 1:15 5:10	3987 52:11 57:4
14C 16:24 24:11	240:11	138:6 140:17	7:2,5 254:17	77:11,15
24:14	20-page 52:23	147:10,12	28034 160:7,8	3987-12 55:10
14th 254:21	2000 252:10	148:13 153:21	161:15,15,18	3987-85 54:3
15 14:19 91:23	2000- 15:4	167:8 207:2	282-9119 2:4	3rd 176:4
92:24 125:19	20005 2:12	2017 1:16 5:10	28th 148:13	3S 29:24 30:1,3
140:18,23	2001 16:7	5:12 36:13	29 27:10 51:6	
176:16 220:21	2002 15:2 16:10	44:19 113:3,7	60:23 95:12	4
228:16 238:17	16:10 73:17,18	114:20 136:7	113:22 151:18	4 17:1 25:15,20
15,000 242:3,4	2003 14:20	203:14 204:11	161:4 238:10	40:11 56:19,20
15,132 239:17	73:19	207:2,3,9	241:3 243:6	127:17 205:20
239:18,21	2004 14:20 54:5	238:1 254:17	297 238:15	4- 82:6
15C 43:10 45:15	73:19 80:15,22	256:15	2S 29:24 30:1	4.3 57:16
16 223:21,24	2005 14:20	2018 254:19	41:3 42:12,22	40 242:18
1600 2:7	2007 256:21	202 2:12		400 207:17
16th 60:16	2008 176:1	2101 2:15	3	250:23 251:14
17 7:2 208:20	2009 154:22	213 194:6	3 25:20 27:23,24	252:1,9,10,24
173 239:2	186:12	21342 191:20	48:1 205:20	253:11,17
17th 140:16	2010 26:13	194:10	233:18 234:1,6	401 11:14 33:3,5
18 11:18,22 14:3	36:11,12 44:19	21404 184:17	235:3	33:6 93:12
14:3 95:14	47:9 113:7	21405 184:15	3.5 46:1	137:11,23
169:19	114:20 180:16	21469 199:10	3:00-ish 211:3	151:6 160:19
18.5 25:7,8,12	237:24	21st 91:17	3:55 254:16	160:20
188 48:6	2011 12:1 30:10	147:10,12	30 25:5,6,6	403 69:5 70:22
19 14:3 238:18	74:18,24	221 4:16	28:14 175:10	406 184:14
239:2	2012 54:11	23 129:16	226:3,6	191:19
1970's 87:6	80:14 175:7	23rd 153:21	312 2:4,8,22	407 4:12 48:20
1985 52:11	176:5,7 186:12	254:23	256:22	48:23,24 49:8
1994 171:16	214:15 221:7	24.5E 4:16	32 33:1,8	49:9 56:20
1998 10:19	2013 78:7 85:17	221:17,22	33 100:2,5,8,9	59:22 60:4
72:13 214:24	175:7,8 176:6	222:7,9,15	105:11	65:17 70:19

81:6,18,23,24 138:2 186:1,2 408 4:14 49:7 60:7,10 65:18 65:19 66:4 81:7 140:12 167:11 409 52:17 54:3 55:24 58:19 59:3,17 70:19 77:13,21 78:15 78:18 409-410 4:13 58:17 410 54:12 55:10 56:1,17 58:19 59:3,17 70:19 77:14,21 78:11 411 223:10,13 415 2:17 419-9292 256:22 424 238:23 42545 206:18 43849 7:3 43857 7:3 44 15:19 452 116:10 117:2 118:7 120:7 48 4:12 48612 175:19 49254 140:4 49362 164:15,15 49459 165:5 166:24 4th 214:15	50 163:5 173:16 173:20,21 253:17 505.05 113:9 505.65 113:9 505.77 113:7 506 114:16 51261 214:7,16 51281 214:6,21 51296 214:16 516 114:5,12,15 51722 139:24 525 149:14 534 67:17 53522 147:10 53523 147:17,24 149:14 53525 147:17,24 53528 148:10 53578 95:3 55 28:17 53:12 58 4:13 580 67:17 580.34 67:18 580.5 67:20 68:1 581.02 23:2 582.5 23:2 583.96 23:2 584.15 23:4,4 585.5 68:1 590 230:17 5th 204:11	62540 204:15,16 62545 206:11 62546 207:21 62547 208:19 62548 209:11 62549 210:4 65 113:9 6670 6:24 6734 6:24 68 4:15 <hr/> 7 7 14:2 41:1,2,13 213:6 70 86:23 71 4:5 7165 17:1 7171 24:16,18 24:19 7249 43:12 7252 45:16 795-3712 2:8 7th 30:10 <hr/> 8 8 13:11,19 41:1 41:2,13 256:21 8th 49:5 59:23 81:12 82:3 139:18 155:24 185:24 218:9 224:2 <hr/> 9 9 4:4 13:11,19 14:2 41:2,2,14 9-040 1:14 9:00 5:10 9:01 1:16 94612 2:16 9728 100:6,10 977-5637 2:17 9th 139:23 167:14,15 169:21 218:14 218:15
<hr/> 5 5 14:2 22:22,22 40:9,11 205:20 228:18 5- 65:17 5.0 67:6,10 5/11/2015 206:15 5/2017 22:16 5/3/2017 206:15	<hr/> 6 6 13:19 40:9,11 204:15 60 4:14 86:23 112:5 60,000 198:14 198:15 60091 2:3 60601 2:7 60603 2:22 256:22 62387 22:7 62393 22:11 62535 204:7	