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IMPORTANT NOTICE

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DRAFT

AGREEMENT OF PARTIES

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9 REPORTER'S NOTE:

10

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12 and/or an unedited disk provided, it's in
13 rough draft form. Please be aware that
14 there may be a discrepancy regarding page
15 and line numbers when comparing the
16 realtime screen, the rough draft, rough
17 draft disk and the final transcript.

18

19 Also please be aware that the realtime
20 screen and the uncertified rough draft
21 transcript and/or unedited disk may
22 contain untranslated steno, reporter's
23 notes in double parentheses, misspelled
24 proper names, incorrect or missing Q/A
25 symbols or punctuation and/or nonsensical

♀

Rough draft

1 English word combinations and/or missing
2 text if real-time reporter was unable to
3 slow down or stop the proceedings to
4 correct the foregoing. All such entries
5 will be corrected on the final, certified
6 transcript.

7

8

TAMBI BALCHEN

9

CERTIFIED REAL-TIME REPORTER

10

11

*** UNEDITED REALTIME VERSION

12

*** test test test test test test

13

MS. WHIPPLE:

14

MR. BECK: Mr. Beck Mr. Beck's Mike Elderkin of
Mike Elderkin Langley.

15

16

THE VIDEOGRAPHER: Okay.

17

THE WITNESS:

18

A . Testing. October 14, /#25Z test test
check 1, 2. One moment.

19

20

THE VIDEOGRAPHER: We're now on the record. The
time is 855:00 a.m. Today's date is
October 14, 2015. This is the video
recorded deposition of Tony Sperling being
held at 1040 west Georgia Street Vancouver
Canada in the state of State of Missouri

21

22

23

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Rough draft

1 versus Republic Services, Inc. et al in
2 the United States district for the eastern
3 district of Missouri eastern division the
4 case number is 4: 15-cv-01506. The video
5 operator is Mike Elderkin of Mike Elderkin
6 media Langley Canada. Counsel please
7 introduce and state.

8 MS. WHIPPLE: Pig Whipple from the Missouri
9 Attorney General's office on behalf of of
10 the state and we are also note on the
11 record that there's a state Court case in
12 which this case will technically also be
13 pending.

14 MR. BECK: My name is bill Beck I'm here with
15 alley Cunningham we represent Bridgeton
16 landfill and its fails and with regard to
17 the that is the removed case you're
18 talking about.

19 MS. WHIPPLE: If it ends up back in in state
20 Court there is a Court case I don't have
21 the number right in front of me. We can
22 read it into the record.

23 MR. BECK: No need. We've all agreed that the
24 depositions are useful no matter.

25 THE VIDEOGRAPHER: Will the Court reporter

Rough draft

1 please , 2011.
2 VANCOUVER, B.C.
3 (PROCEEDINGS COMMENCED AT)
4 , duly sworn or affirmed
5 EXAMINATION BY :
6 2015
7 Q Was your name at birth ant Sperling?
8 A That's correct.
9 Q Middle name?
10 A I don't have one.
11 Q And we are taking your deposition in
12 Canada for use in a case that's pending in
13 Missouri, you understand that?
14 A Correct.
15 Q My name is bill Beck. Do me a big favour.
16 Have you taken a lot of depositions before
17 today?
18 A No.
19 Q Any?
20 A No.
21 Q So here's the first rule. This nice lady
22 right next to me is going to write down
23 everything that I say and everything that
24 you say and she can do that if but only if
25 we talk sequentially and not on top of one

Rough draft

1 another, so do me the favour of letting me
2 get my question out. That will give Ms.
3 whipple the advantage if she feel she
4 needs do then do your answer but try to
5 give enough space in between so that the
6 Court reporter can act?

7 A Sure.

8 Q You went to Missouri in the week that
9 included July 22nd, 2015 and went to the
10 Bridgeton Landfill, among other things,
11 true?

12 A Correct.

13 Q Had you been to Missouri before that?

14 A No.

15 Q Have you been to Missouri sips?

16 A No.

17 Q Do you know that our case is scheduled to
18 be tried, assuming the schedule holds, in
19 this March of 2016?

20 A Yes, so I was advised.

21 Q Is it your plan to attend and testify?

22 A If I'm required to do.

23 Q No one is required to do anything, but I
24 assume you committed to them that you
25 will?

Rough draft

1 A Yes.

2 Q Have you ever done any work before in
3 connection with any landfill located in
4 Missouri?

5 A Not to my recollection. I have worked on
6 numerous projects in the U.S. over the
7 years and after a while they kind of get
8 mixed, but I don't have a recollection of
9 working in Missouri previously.

10 Q The company I represent Bridgeton Landfill
11 LLC is a subsidiary of a parent company
12 whose name is Republic Services, Inc.?

13 A M'hmm.

14 Q You're familiar with them?

15 A Yes.

16 Q Have you ever done any work for Republic
17 Services, Inc. or any company which at the
18 time was part of the Republic Services
19 family of companies?

20 A I do not believe I have.

21 Q If I saw correctly whether it was your
22 bioor your website, some place I saw that
23 you had done some work for a company
24 called voice management?

25 A Correct.

Rough draft

1 Q What was that work?

2 A It was on a demolition in the eastern
3 landfill. I'm trying to remember the
4 actual state it was in. It was definitely
5 I believe it was in minute society but it
6 was quite a while ago.

7 Q Do you remember the name of the landfill?

8 A It's not in my mind right now. Just one
9 of many projects I've done.

10 Q Okay. And what did you do for the waste
11 management entity that was involved with
12 that landfill?

13 A Basically they had a subsurface landfill
14 fire in a large demolition landfill and I
15 was asked to provide an assessment of how
16 to deal with it and so we undertook an
17 investigation of that site and provided
18 some recommendations on approach to try
19 and manage it.

20 Q And you said that was some time ago?

21 A Yeah, I would estimate somewhere in the
22 neighbourhood of eight to ten years
23 previously.

24 Q Previously to today in 2015?

25 A Today, correct.

Rough draft

1 Q And during the eight to ten years since
2 then, has waste management ever asked you
3 to do anything else for them?

4 A Not that I'm aware of, no.

5 Q And you know them to be the largest solid
6 waste company in the United States?

7 A That's my understanding, yes.

8 Q Now, apart from waste management and
9 Republic, we determined you did one job
10 for waste management, none for Republic.
11 Apart from those do what other solid waste
12 companies in the United States have been
13 done work for, companies, not
14 municipalities?

15 A Most of my work has been for municipal
16 governments-type landfills and the only
17 other corporate case I've been involved
18 with to my recollection is a Pasco
19 Washington.

20 Q What's that city again?

21 A Pasco and that was an industrial landfill
22 I was retained in the capacity, again, as
23 an expert advisor.

24 Q But you didn't testify in that case?

25 A No. I think it's still active. I'm not

Rough draft

1 sure quite sure where it's at.
2 Q And by whom were you retained in that
3 case?
4 A Aspect Consulting Limited which is an
5 environmental consulting firm.
6 Q And who was their client?
7 A It was a group of owners of one of the
8 landfills that are there's sort of two
9 landfills in that complex and there's
10 basically an industrial group and a
11 municipal waste group and I was working
12 for the municipal waste group.
13 Q And you said that was a soup found site?
14 A Correct.
15 Q And do you mean by that it was listed by
16 the EPA on its national priorities
17 website?
18 A That's -- I believe so.
19 Q Do you know the name of that site?
20 A I only know it as the Pasco landfill.
21 Q Okay.
22 Q In addition to assisting did you assist
23 counsel at any meetings?
24 A We attended many meetings that were
25 attended by a number of lawyers basically

Rough draft

- 1 for this municipal landfill group.
- 2 Q And so the site itself contained both an
- 3 industrial landfill and a municipal
- 4 landfill and there was disagreement
- 5 between the two groups?
- 6 A Correct. Yeah, basically there were two
- 7 landfills. One had a lot of barrels and
- 8 other toxic substances, you know, from
- 9 industrial processes and right essentially
- 10 beside it was a landfill municipal solid
- 11 waste and there was a fire kind of right
- 12 in the middle and there was a debate on
- 13 who caused it and such and how to deal
- 14 with it.
- 15 Q What was the scope of your assignment?
- 16 A Basically it was to review the information
- 17 and provide advice to Aspect on how to
- 18 manage it. And I'm not sure if this being
- 19 a confidential matter that I'm privy to
- 20 really discuss it at any length. I feel I
- 21 probably shouldn't.
- 22 Q So if I ask you a bunch of detailed
- 23 questions you would feel you had to not
- 24 answer?
- 25 A Correct.

Rough draft

1 Q Was the fire in the middle of the two
2 landfills visible from the surface?

3 A No.

4 Q And what, to your recollection, was the
5 approximate depth to the event?

6 A I believe about -- anywhere from 20 to 40
7 feet or 50 feet.

8 Q Was either landfill or were both landfills
9 built in quarries?

10 A No.

11 Q So how did they become -- how did they
12 come to be excavated to as much as 40
13 feet?

14 A Basically there was sand gravel
15 extraction-type operations, so a gravel
16 pit is my impression it's all consolidated
17 material, not a rock quarry.

18 Q I see.

19 And so there was still mining done.
20 There was still a hole left by that mining
21 and the landfilling was used to reclaim
22 the land or fill the hole?

23 A Essentially, yeah. I wouldn't call it
24 mining. Mining to me is a term in purely
25 rock excavation.

Rough draft

1 Q But sand and gravel use for work?
2 A Extraction, correct, yes.
3 [Indiscernible - simultaneous speaking]
4 Q For the event in Minnesota when you
5 consulted with a waste management entity
6 was there a fire that was visible from the
7 surface?
8 A No. There was some release of smoke
9 visible from the surface, but no flame
10 visible at surface.
11 Q Okay.
12 And the smoke was from the fire?
13 A Yes.
14 Q When you visited the Bridgeton landfill
15 did you see any smoke?
16 A No.
17 Q Has anyone reported to you that anyone has
18 seen smoke at Bridgeton Landfill other
19 than the one day event in 2014 mentioned
20 in your expert report and the extended
21 event in 1992 to 1994 mentioned in your
22 expert report?
23 A Not that I recollect.
24 Q As between yourself and Ali Abedini who is
25 shown as a co-author of this report arrest

Rough draft

1 at least I understand he is, what was the
2 division of labor?

3 A Ali did most of the or supported me in
4 basically doing a lot of the data analysis
5 and so he was the master of the SCS
6 database and basically doing all the
7 graphing work and charting work and
8 essentially with my direction in
9 information I was interested in exploring.

10 The report predominantly was written
11 by me and I discussed in the areas of
12 landfill gas where I feel Ali has much
13 more knowledge than myself. I had
14 numerous discussions with him on to make
15 sure I was getting things right.

16 Q So there are some graphs from the SCS
17 landfill gas database that contained hand
18 highlighting or hand trend lining. were
19 those written by him or by you?

20 A So basically there were two different
21 sets. Hand markups in the black felt
22 marker are mine.

23 Q Okay.

24 A And my interpretation and some of the
25 finer differentials or character writing

Rough draft

1 would be Ali he was looking at.

2 Q what about the highlighting in colors,
3 purple, yellow?

4 A That was mine.

5 Q Have you ever designed, you yourself
6 personally, not someone working for you,
7 designed a landfill gas collection and
8 control system?

9 A No.

10 Q One of the acronyms that is used in your
11 report, Exhibit 1, is NSPS. Do you know
12 what that stands for?

13 A Yeah, I believe it's National Source --
14 National standards. I did recollect it.
15 It's not a term I use regularly. It's
16 defined in my report, but it's something
17 that, you know, being from Canada I don't
18 relate to it immediately, so I would have
19 to dig it up. I believe it's National
20 Source Priority standard.

21 Q National source priority standard cap had
22 4?

23 A Something like that. I suspect I got one
24 of the two words. I would have to look it
25 up.

Rough draft

1 Q Have you ever served for a landfill as its
2 NSPS compliance officer?

3 A No.

4 Q Have you ever read the NSPS regulations?

5 A I have, yes. I've researched them on the
6 web and primarily I was looking at the
7 sort of the limits that are in the NSPS
8 document.

9 Q There's two ways you can look at a
10 document. One is to search in it on the
11 web for words that pop up on Google?

12 A Yes.

13 Q And read the parts that come up another is
14 to actually get the whole document pdf.

15 A Yes.

16 Q And read it cover to cover. Have you ever
17 read it cover to cover?

18 A Actually the words come back to me. I
19 think the first two is new source and then
20 the last standard and the P now whether
21 it's prevention, but anyway, clearly it's
22 not something that's superfamiliar and
23 it's not something that I use every day.

24 Q Do you know whether or not the NSPS
25 regulations are applicable to Bridgeton

Rough draft

1 Landfill?

2 A I would believe that they are, but I
3 couldn't swear to that. There are they
4 are definitely referenced and I'll lead
5 that to a question and answer.

6 Q When you saw the Bridgeton Landfill
7 yourself in July you saw plenty of
8 evidence that there exists a landfill gas
9 collection and control system, correct?

10 A Without a doubt.

11 Q Is that the most extensive one you've ever
12 seen?

13 A Yes.

14 Q Do you know if under the NSPS standards
15 Bridgeton Landfill is even required to
16 have a landfill gas collection and control
17 system by virtue of those standards?

18 A No, I do not.

19 Q So there are places in your report where
20 you cite requirements of the NSPS
21 standards, for example, the provision with
22 respect to oxygen inflow at a gas
23 extraction well being 5 percent or less of
24 the gas.

25 A M'hmm many.

Rough draft

1 Q Is that a standard that you looked up or
2 that Ali Abedini gave to you?

3 A Both.

4 Q Another provision that you refer to in the
5 report is a limitation that methane gas in
6 the subsurface at the property boundary
7 should not exceed one half of the low
8 explosive limit for methane or 2 1/2
9 percent?

10 A M'hmm.

11 Q Is that something you read in the NSPS
12 standards or that Mr. Abedini gave you or
13 both or neither?

14 A Neither.

15 Q And so where did you find that?

16 A Basically in my review of the documents
17 that I was undertaking, some of the
18 information I came across that in sort of
19 researching the reasons for the gas
20 extraction system and the parent, you
21 know, aggressive collection of gas,
22 basically came across numerous discussions
23 of those requirements.

24 Q So you picked it up as part of your
25 reading?

Rough draft

1 A Correct.

2 Q Did you do anything to confirm whether or
3 not that 2 1/2 percent limitation is part
4 of the new source performance standards
5 before you reported that in your report?

6 A No.

7 Q And as you sit here today under oath, do
8 you know whether or not that limitation is
9 is part of the new source performance
10 standards?

11 A No, I do not.

12 Q I was covering some of your work at
13 landfills in the United States and I think
14 we exhausted, I think, the ones that
15 you've done for private companies --

16 A M'hmm.

17 Q As opposed to to municipal entities or
18 other governments?

19 A M'hmm.

20 Q The correct?

21 A Yes.

22 Q The second rule for depositions is that
23 you have to answer with a word so that it
24 can make a?

25 A Thank you.

Rough draft

1 Q Some people I give them to you as you need
2 them.

3 A Great.

4 Q With respect to your work for governments,
5 units of government that have landfills
6 that operate landfills or own them, about
7 how many of those in the U.S. have you
8 provided assistance to?

9 A I would estimate somewhere in four or five
10 in the States.

11 Q So your total in the States would be six
12 or seven of which four of five would be
13 governmental and two would be private?

14 A Something like that.

15 Q Okay. And of the four or five that were
16 governmental, can you just go through them
17 and give me as much information as you can
18 to identify the landfill and describe what
19 you did?

20 A Okay. So one project, cedar landfill in
21 Seattle, King County, they had a surface
22 and I was asked by the manager to do an
23 assessment of that and what should be
24 done. So I believe that was a well, a hot
25 well situation and so I provided some

Rough draft

1 recommendations on dealing with -- with
2 that.

3 In DesMoines, Iowa I did several
4 projects for the landfill manager there
5 including initially developing a fire pre-
6 plan and then subsequently they had a hot
7 well situation again with lots of
8 subsidence around the well so they flew me
9 out to have a look to determine what steps
10 should be taken.

11 Q May I stop you for just a second. Was
12 that poke County?

13 A No.

14 Q Is that a different one Polk?

15 A I'm trying to recollect now. Polk County
16 or -- it may be. I would have to review
17 my file. I sort of in my mind it's metro
18 waste authority in DesMoines Iowa. I
19 recollect the name Polk County, but I have
20 no recollection of actually what site
21 that's at now.

22 Q Pardon my ignorance of this, but does
23 Canada have counties?

24 A No, we basically have provinces and
25 regional districts which I think are

Rough draft

1 similar to counties.

2 Q ?

3 Q what other landfills operated by
4 government entities have you worked on in
5 the United States?

6 A I worked in the project, I believe it's
7 Brook Haven in New York and that was -- I
8 believe that was municipal but I'm not
9 sure 100 percent sure now whether the
10 waste authority there exactly whether it
11 was public or private. So sort of knew it
12 as Brook Haven landfill.

13 Q And what did you do for them?

14 A I basically did again an assessment of a
15 subsurface heating event which we believe
16 to be in an underground fire and provided
17 recommendations on, you know, the provided
18 / (the investigations to be undertaken in
19 this dealing with that material.

20 Q All right. I've got Brook Haven, cedar in
21 Seattle, DesMoines, what are the other one
22 or ones?

23 A I did a project in the U.S. virgin islands
24 which technically I guess would be part of
25 the United States. Again, they had an

Rough draft

1 ongoing fire situation and so I was asked
2 to provide some advice that -- that one,
3 actually, I'm trying to recollect was
4 initially a proposal, come to think of it,
5 I went down there ultimately wasn't a
6 project. There was another company that
7 was retained for that one so that ended up
8 not being a project.

9 Q So you were not hired?

10 A Correct. I was down there a couple of
11 times.

12 And there's probably oh yes,
13 recently I did a project in Montana, Lake
14 County Montana again for the local County
15 facility there and that was a subsurface
16 ongoing fire.

17 Q Any other U.S. landfill projects you can
18 recall?

19 A Give me -- if if you don't mind, just to
20 sort of recollect.

21 Q Of course?

22 A If I can think of some others. Yes,
23 actually this is for a private landfill in
24 Oregon I believe it was called waste
25 Connections and they had sort of numerous

Rough draft

1 breakout of a fire event we were trying
2 to understand what was causing them so I
3 tried to help them to kind of understand
4 what was going on.

5 Q was that a fire with a smoke and flames?

6 A At the time it was not while I was there,
7 but previous to that I believe it was.

8 Q Okay. In the Montana lake County landfill
9 was that a fire with smoke and flames?

10 A When I was on site there was definitely
11 smoke. It was all subsurface so there was
12 no visible flame until we did some floor
13 tri excavations and saw below.

14 Q So once you opened it up you saw the
15 flame?

16 A Yes, sir.

17 Q The DesMoines project, was that a fire
18 with smoke and flames?

19 A No.

20 Q The Seattle King County project was that a
21 fire with smoke and flame?

22 A No.

23 Q And the Brook haven New York landfill was
24 that a fire with smoke and flames?

25 A No, subsurface.

Rough draft

1 Q Were you asked in Brook haven to form a
2 conclusion about what had caused the event
3 you were consulting with -- for?

4 A No.

5 Q How about cedar? were you asked to form
6 an opinion or conclusion as to the cause
7 of that event?

8 A I believe so. I would have to review my
9 report and a lot of these projects were
10 m'hmm years ago, so they're not fresh in
11 my mind anymore.

12 Q Do you recall what the cause of the cedar
13 event was in King County?

14 A My recollection was an overdrawn gas well
15 from a structure.

16 Q And so that although it was in the
17 subsurface that was still a fire that
18 would have had a flame if you had opened
19 it up to the air?

20 A I would believe so, yes.

21 Q With respect to DesMoines were you asked
22 to form any conclusion about what had
23 caused that problem?

24 A My recollection is yes.

25 Q Was it overdraw?

Rough draft

1 A Yes, it was very confined to one well in
2 particular.

3 Q One gas extraction well?

4 A Correct.

5 Q And I didn't ask you as precisely as this
6 at Brook haven be whether you were asked
7 to or not did you actually form any
8 opinion about what caused the Brook haven
9 event?

10 A I believe so, yes.

11 Q what did you conclude?

12 A That I suspected it was basically an air
13 intrusion driven by, again, very
14 aggressive overdraw on their gas
15 collection system.

16 Q And for the lake County Montana landfill
17 with the subsurface landfill fire that had
18 smoke, did you come to a conclusion as to
19 what had caused that fire?

20 A Yes.

21 Q And what was it?

22 A Spontaneous combustion.

23 Q So not over draw?

24 A They didn't have a gas system. It's a
25 smaller site.

Rough draft

1 Q And how did it spontaneously combust?
2 A Basically inadequate cover allowing air to
3 enter into the waste mass.
4 Q So you told them to augment their cover?
5 A Yes.
6 Q Were they in violation of cover
7 regulations?
8 A Again, I'm not familiar with the U.S.
9 regulations on covers. They certainly
10 were not following best practice on -- on
11 the amount of cover placed on the
12 material.
13 Q If I remember to subtitle D, do you know
14 what that means?
15 A I'm familiar with it and have reviewed it
16 in the past, not as part of this project.
17 Q But historically you have some knowledge
18 of it?
19 A I have come across it and it's similar to
20 our material in British Columbia.
21 Q Now, you've been doing this kind of work
22 for a couple of decades plus, right?
23 A Correct.
24 Q And so if you had six or seven U.S.
25 assignments during that time, I assume you

Rough draft

1 had many, many more assignments up here in
2 Canada?

3 A Correct.

4 Q Approximately what percentage of your work
5 has been U.S. work as opposed to Canadian
6 work?

7 A Is this a question on landfill fire
8 control fire work or just work in general?

9 Q Landfill fire?

10 A So my landfill work is predominantly
11 limited working in British Columbia.
12 Like, I have very, very few assignments in
13 the States if any. I'm trying to
14 recollect there may have been, you know, a
15 couple over the years. So and war's
16 whereas my landfill fire work is much more
17 global and probably work in the U.S. I
18 would represent maybe between 10 to 20
19 percent of the total projects I've done.

20 Q So your landfill work overall a very small
21 portion is U.S.?

22 A Correct.

23 Q But your landfill fire work it may be 10
24 to 20 percent?

25 A Correct.

Rough draft

1 Q And do you carefully separate those so
2 that the landfill work which is not fire
3 work is done through Sperling Hansen but
4 the landfill fire work is all done through
5 landfill fire control?
6 A That's my intent.
7 Q It may bleed over, but that's what you try
8 to do?
9 A Yes.
10 Q You're the president of both companies?
11 A Correct.
12 Q Do they have different ownerships?
13 A Yes.
14 Q As a rule of thumb, though, if you get a
15 call about a project and decide to become
16 involved, if it involves a fire you do it
17 under landfill fire control?
18 A Correct.
19 Q If it involves not a fire but a landfill
20 then you do it under Sperling Hansen
21 Associates?
22 A Correct.
23 Q In addition, well, I don't think I
24 established this. Are you the person in
25 charge of either of those companies?

Rough draft

1 A Yes.
2 Q which one, both?
3 A Both.
4 Q Are you the sole owner of either?
5 A No.
6 Q Does Mr. Hans still own part of Sperling
7 Hansen associates?
8 A A very small part.
9 Q Are there other owners besides him and
10 yourself?
11 A Yes and who are the owners of landfill
12 fire Control Inc.
13 A A holding company called Silver Moose
14 Holdings.
15 Q And who are the owners of the holding
16 company?
17 A My wife and myself.
18 Q Anybody else?
19 A No.
20 Q Are there people who work for both
21 companies?
22 A Basically, the way we're set up is that
23 Landfill Fire Control draws on resources
24 including staff from Sperling Hansen as
25 required and then basically Sperling

Rough draft

1 Hansen will bill Landfill Fire Control for
2 that work and so I try and keep a balance
3 of or treat my partners in the other
4 business fairly when I pull people into
5 landfill fire control.

6 Q Are there other people who receive
7 economic benefit from the work controlled
8 by landfill fire control Inc. besides you
9 and your wife through this holding
10 company?

11 A No.

12 Q Is Todd Thalhamer involved with Landfill
13 Fire Control Inc.?

14 A He is, in a way, like Todd has a company I
15 believe it's called Hammer Consulting or
16 something and I've worked with Todd on
17 numerous fire projects and so if I require
18 some high level support, I'll ask Todd to
19 provide, you know, if he's available to
20 come and help me out and we've agreed to
21 basically also have him on our website,
22 you know, as one of the resources that we
23 have access to.

24 Q So the actual relationship is is he's a
25 subcontractor occasionally, but you

Rough draft

1 advertise his services with your own?

2 A Correct.

3 Q But when he does work with you on a
4 project through Landfill Fire Control Inc.
5 you simply pay him a consulting for the
6 time and effort that Mr. Thalhamer puts
7 in?

8 A Correct.

9 Q And do you have any ownership involvement
10 in Hammer Consulting at all?

11 A No.

12 Q And does he have any ownership involvement
13 in Sperling Hansen Associates at all?

14 A No.

15 Q Going to Exhibit 1 and let me just explain
16 what I've done here so there won't be a
17 mystery about it. Obviously the thing you
18 submitted to us is longer than the pages
19 I have printed for you.

20 A Many had many.

21 Q I have separated all the appendices no
22 into separate exhibits because that's
23 easier for me in the standpoint of going
24 through them and it makes a smaller pile
25 of paper for you to look through for my

Rough draft

1 first portion of questioning, but you
2 understand your report to be comprised of
3 both what is in front of you as Exhibit 1
4 plus a number of appendices?

5 A Correct.

6 Q Is there some place where you wrote down a
7 list of all the documents from which you
8 obtained factual information that is
9 recited in this report, Exhibit 1?

10 A Yeah, there's basically a reference list
11 at the back of our report that's probably
12 in here somewhere.

13 Q Can you show me? If it's an appendix we
14 can find it, but if you can show it to me
15 that would help?

16 A I believe it to be one of the last
17 chapters in the -- so Section 14 on page
18 117.

19 Q I hear you, but that's actually for the
20 most part a list of -- well, let me go
21 through it.

22 Starting on page 117 under chapter
23 14 references, the first item first author
24 is Bahor is not something specific to
25 Bridgeton Landfill, correct?

Rough draft

- 1 A M'hmm.
- 2 Q Is that correct?
- 3 A Yeah, let me get to it so I know what
4 you're looking at.
- 5 Q Of course.
- 6 A Correct.
- 7 Q The second item by Babrauskas is not
8 specific to Bridgeton Landfill?
- 9 A In terms of specific to --
- 10 Q It's literature?
- 11 A Yes, but it's not written about Bridgeton
12 Landfill, if that's what you're asking,
13 yes.
- 14 Q Correct. The third item by Bates was not
15 written about Bridgeton Landfill?
- 16 A Correct.
- 17 Q The fourth item by burns Mcdone is a
18 technical report concerning Bridgeton
19 Landfill? spelling
- 20 A Correct.
- 21 Q The fifth item by Peter Carrie (spelling)
22 is a draft mechanical report /(concerning
23 Bridgeton Landfill?
- 24 A Correct.
- 25 Q The sixth item by SEC and weaver booth is

Rough draft

- 1 a document specific to Bridgeton Landfill?
- 2 A Yes.
- 3 Q The next four documents are literature
4 that is not specific to Bridgeton
5 Landfill, correct?
- 6 A Yes.
- 7 Q The next which is Golder associates is a
8 technical report from 1995 that is
9 specific to Bridgeton Landfill, correct?
- 10 A Correct.
- 11 Q The next is is a piece of literature by
12 hall and others that is not specific to
13 Bridgeton Landfill?
- 14 A Correct.
- 15 Q At the top of page 118, if I if I'm
16 looking at it accurately there's not a
17 single document on that page that is
18 specific to Bridgeton Landfill; is that
19 correct?
- 20 A Give me a second, please.
- 21 Q Of course.
- 22 A Correct.
- 23 Q On the last page, the first item by
24 Thalhamer hammer is specific to Bridgeton
25 Landfill?

Rough draft

- 1 A Correct.
- 2 Q And the last item is literature that is
3 not specific to Bridgeton Landfill?
- 4 A Correct.
- 5 Q So I made stars along the way. I've got
6 five items in your reference list that are
7 specific to Bridgeton Landfill?
- 8 A M'hmm.
- 9 Q Are those five items and anything that you
10 refer to specifically by what's called
11 Bates number or production number all the
12 materials that you drew facts from for
13 this report specifically?
- 14 A No. Most of the information that I sort
15 of referenced there's a fairly extensive
16 table in the report and I'll find it again
17 where I sort of listed the key facts or
18 information that I felt was important. I
19 attached the Bates numbers wherever I came
20 across that. So which sort of indicates
21 the I believe most of the things that I
22 reviewed.
- 23 Q You're referring to the table that has the
24 chronology?
- 25 A Correct, yes.

Rough draft

1 Q We'll get to that.

2 A Okay.

3 Q Are there any documents from which are
4 obtained facts other than the ones listed
5 in the table, the ones called out
6 specifically by their Bates production
7 number and the five listed in the
8 references?

9 A There may be. I couldn't now comment. I
10 was given a very extensive pile of
11 information to review by the Attorney
12 General's office 5 gigabytes of
13 information and basically I started
14 reading that information and tried to
15 review the key reports. I think most of
16 them I captured in appendix, but off the
17 top of my head I couldn't sort of list I
18 could sort of list the ones that I
19 reviewed and there might be a few that are
20 missing, like.

21 Q Go ahead. That woulding fine.

22 A Okay. So I started with a general report
23 I believe it was done by SCS on the
24 strategy for addressing or creating a
25 barrier in the neck and within that single

Rough draft

1 file there was like multiple reports so
2 that was my starting point in the review.
3 I think there were four or five reports
4 written by Mr. Carrie, I believe it's
5 listed there. And so I read those in
6 their entirety and took notes on those.

7 And then I followed that with the,
8 you know, I'm trying to think about what
9 they're called. I guess, the depositions
10 of Michael Lambrich (phonetic) (spelling)
11 and then Craig is it was Vasbinder
12 (phonetic) and then the third one, Mr.
13 Almanza, I may have the first names mixed
14 up. They both provided me with some and
15 afterwards I started digging through the
16 various data that I was coming across. So
17 that's sort of the bulk of my review.

18 Q So you read Mr. Vasbinder's deposition
19 from an earlier deposition?

20 A Correct.

21 Q What's his first name?

22 A I believe it's either David or Craig. I
23 got the two mixed up. Spelling /C.

24 Q And then did you read Mr. Almanza's
25 deposition from an earlier lawsuit?

Rough draft

1 A Yes.

2 Q And what's his first name?

3 A I believe it's David or Craig.

4 Q And Mr. Lam you read his from are a first?

5 A Yes, that was the first one I read.

6 Q What was his first name?

7 A I believe it's Michael lam.

8 Q Any other? Spelling

9 A No.

10 Q First group of documents concerning the

11 neck --

12 A M'hmm.

13 Q You mentioned the SCS report and the

14 Carrie report you said there were others

15 in that group. Were the Missouri

16 department of Natural Resources comments

17 in what you reviewed?

18 A I reviewed in that package, if my

19 recollection serves me correctly there

20 were a number of sort of authorization

21 requests and authorizations to do a number

22 of letters I reviewed those and sort of

23 through the approval process for that

24 action.

25 Q As you went through the approval process

Rough draft

1 did you determine whether the Missouri
2 Department of Natural Resources accepted
3 one of the two ideas and rejected the
4 other one?

5 A That was not clear to me from -- from the
6 reading of that material. In fact, it
7 seems like a question as to why, you know,
8 Republic or Bridgeton selected the GIW or
9 the gas interceptor well approach. It
10 just sort of seemed a decision was made
11 and I did not come across a solid basis.

12 Q And there's an assumption built into the
13 phrasing of it. You said Bridgeton
14 Landfill selected it. The do you know if
15 Bridgeton Landfill selected it rather than
16 the State of Missouri selected it?

17 A I do not.

18 Q Now, when you research to the gas
19 interceptor wells strategy for a barrier
20 in the neck, is that the SCS report?

21 A Correct.

22 Q And when you referred to Mr. Carrie's
23 strategy for a barrier in the neck, did
24 that involve a cooling system designed to
25 remove heat?

Rough draft

1 A Yeah, initially his report seemed to
2 review, you know, a full range of
3 different options and seemed to conclude
4 that that cooling system was probably the
5 preferred strategy to implement.
6 Q Do you recall any other documents in that
7 group of four or five documents concerning
8 questions about what might we do at the
9 neck?
10 A No.
11 Q Did you review any other depositions
12 besides Mr. Lam, Mr. Almanza and
13 Mr. Vasbinder?
14 A No.
15 Q Mr. Almanza certainly and I think Mr. Lam,
16 Mr. Almanza was deposed twice once in a
17 case called Buck and you definitely cite
18 some references to that deposition I saw
19 spelling /(?
20 A M'hmm.
21 Q He was also deposed by an insurance
22 company called Excel?
23 A M'hmm.
24 Q Do you know if you saw his deposition
25 given in the Excel case?

Rough draft

1 A I don't believe I did.
2 Q One of the people with whom you
3 collaborated at some point before issuing
4 Exhibit 1 was a gentleman whose name is
5 Patrick Foss-Smith --
6 A Yes.
7 Q -- who is in the UK?
8 A Correct.
9 Q You knew he was working with the insurance
10 company that was trying to deny coverage
11 for Bridgeton Landfill?
12 A Yes.
13 Q And then you learned shortly before your
14 report was due that due to a resolution of
15 that litigation he had suddenly freed up?
16 A Correct.
17 Q Once he freed up, did you do any work with
18 him other than obtaining stating his
19 conclusions to follow up with him?
20 A I received -- we had a couple of telephone
21 calls pertaining primarily to this
22 water-gas shift reaction, that's the main
23 reason why I was wanting to talk to him
24 because I found he had written about that
25 topic.

Rough draft

1 And just very recently I received I
2 believe it was an e-mail earlier last week
3 where he suggested, you know, exploring
4 the cooling loop sort of thing that he had
5 worked on some other project in Britain
6 that he found it very successful and
7 suggested if there was an opportunity to
8 work on that together that that would be a
9 cool thing to do.

10 Q Had you discussed with him the potential
11 use of a cooling loop at Blackwell or did
12 he spontaneously come up with the idea on
13 his own?

14 A Yeah, it came up out of the blue on his
15 own.

16 Q And so knew you've seen or become aware of
17 the work of two different people who
18 suggested the idea of a cooling lap, one
19 was Peter Carrie who assisted the
20 landfill?

21 A M'hmm.

22 Q And the other is is Mr. Foss-Smith who was
23 assisted the insurance company?

24 A .

25 A M'hmm.

Rough draft

1 Q Yes, sir?

2 A Yes, sir.

3 Q Did you end up paying Mr. Foss-Smith for
4 the time he was kind enough to share with
5 you and his ideas?

6 A I -- he wrote a letter to us. I believe
7 it's it's in one of our appendices and I
8 paid him for the time. I believe it was a
9 day or something of his time.

10 Q For writing that report --

11 A Correct.

12 Q That's part of your report?

13 A Yes.

14 Q And was that just rolled into your charges
15 to the Attorney General's?

16 A I believe it was or will be, I'm not sure,
17 you know, it's fairly current stuff.

18 Q How long had you been collaborating with
19 Mr. Foss-Smith during the period of time
20 prior to that e-mail?

21 A A few days, if that. Basically, I was --
22 as we were putting that report together, I
23 felt, started to recognize that, you know,
24 there was something chemical going on and
25 I really tried to get an expert's or

Rough draft

1 people that have been encountered
2 something similar encountered and he was
3 the one of the guys I narrowed in on it
4 was quite late in the completion of the
5 report so it may have been week.

6 Q Dr. Grace was another person you reached
7 out to for the same reason?

8 A Correct.

9 Q And fairly stated, you felt that there was
10 something chemical going on, some kind of
11 reaction. You needed help with someone
12 who specialized in that area to define it
13 and you reached out to two people you
14 regarded as potential experts in that
15 area?

16 A Correct.

17 Q And not to belittle your training or
18 experience at all, but that's simply not
19 inside the bandwidth of Sperling Hansen
20 associates. That's something you had to
21 reach out to get as expertise?

22 A Yes, I have very little expertise in, you
23 know, these organic chemical reactions, so
24 I definitely felt to help me understand
25 what was going on, I wanted to get some

Rough draft

1 people who would know a lot more about it
2 than I do.

3 Q Sure. And, in fact, among the
4 recommendations that you make in Exhibit
5 1, was that going forward in time from
6 now, there's -- it might be good to add
7 someone to the team with that expertise?

8 A Yes.

9 Q One reason for that is that sometimes you
10 can take an action with an entirely
11 beneficial purpose in mind, but because of
12 an unexpected chemical reaction it can
13 cause consequences you never foresaw and
14 you want to troubleshoot ideas with
15 people?

16 A M'hmm.

17 Q Is that true?

18 A Yes, sorry.

19 Q Any other people who are either chemists
20 or chemical engineers that you reached out
21 to for assistance in understanding the
22 chemical reaction issues at Bridgeton
23 Landfill besides Mr. Foss-Smith and
24 Dr. Grace?

25 A Yes. I initially started at the

Rough draft

1 University of British Columbia and with a
2 colleague who I've worked with on numerous
3 projects, Dr. Jim at water. He's actually
4 Dr. Abedini's advisor and then he then
5 appointed me to pointed me to this
6 University of British Columbia center for
7 I'm not sure exactly what they're called,
8 but they do the biomass energy recovery
9 and he gave me a couple names and so I
10 followed up with one of the gentlemen I
11 don't recollect his name it's Jim
12 something or other I believe I may even be
13 wrong there and he led me on to Dr. John
14 grace so that's how the connection was
15 formulated and other than that I was sort
16 of scrambling to try and find people with
17 that expertise and, you know, researching
18 making phone calls, but I don't believe I
19 ended up with anybody else. I may have
20 talked in very passing to other people,
21 but I haven't -- I have no recollection.
22 Certainly didn't engage anybody in great
23 detail.

24 Q Scrambling in the sense of being short of
25 time?

Rough draft

- 1 A Correct.
- 2 Q And did Jim Atwater provide anything for
3 you other than a referral that got you to
4 Dr. Grace, anything substantive?
- 5 A Not of significant. He expressed an
6 interest in the matter but felt that it
7 was really better to go right to the
8 people who sort of, you know, work with
9 that kind of chemical reaction.
- 10 Q And then the intermediary person between
11 Mr. Atwater and Dr. Grace, did he provide
12 anything substantive other than leading
13 you to Dr. Grace?
- 14 A Again, just a broad confirmation of my
15 suspicions that there might be something
16 going on with the reaction but he felt
17 that that was his area of research more so
18 and he would be the guy to talk to.
- 19 Q And so your final two resources that you
20 actually collaborated with in writing the
21 report were Mr. Foss-Smith and Dr. Grace?
- 22 A Correct.
- 23 Q And that collaboration is expressed in
24 writing and shows up as appendices --
- 25 A Yes.

Rough draft

1 Q -- to your report?

2 A Yes.

3 Q Did either of them write before writing
4 your report beyond that that you can
5 recall?

6 A No.

7 Q How many conversations did you have with
8 Dr. Grace before you wrote your report?

9 A I would -- I'll tell you my recollection
10 may not be totally exact. We had I
11 believe one or two phone calls initially
12 and then I invited him to come to my
13 office for a meeting and we had a very I
14 believe constructive discussion. He
15 educated me a lot on all of these
16 different reactions and I explained to him
17 what I'm trying to achieve as an
18 understanding of the process and asked him
19 to provide me with a report. He submitted
20 initially a draft of that report for my
21 review.

22 I received that and wanted a few
23 clarifications and then he submitted a
24 final report and -- and I believe I'm
25 trying to think if we had one more

Rough draft

1 telephone conversation after that or not.
2 I can't recollect now, but that was
3 basically the extent of our -- and I'm
4 just trying to recollect if he submitted
5 an invoice for his time yet, but anyway.
6 Q If he wasn't, you expect him to?
7 A Absolutely.
8 Q And you would expect him to be paid?
9 A Absolutely.
10 Q with respect to his draft that you asked
11 for clarification of, do you recall the
12 areas that you asked him to clarify?
13 A Not specifically. There were -- a couple
14 things I think that just were not clear to
15 me. I don't remember the details now. It
16 was more in terms of the information
17 that -- that we discussed in our meeting
18 that I believe a couple things were not
19 captured or something in that report in
20 reviewing my notes so I just wanted to
21 make sure that we captured everything that
22 we discussed.
23 Q In your report you coin the acronym SSSER,
24 correct?
25 A Yes.

Rough draft

1 Q That's not something you read somewhere
2 else. That's one you came up with?
3 A Basically I've come across the SER
4 subsurface exothermic reaction and what I
5 felt was important to because it's I felt
6 it's something, you know, extremely
7 important as a landfill design engineer
8 that people recognize that this reaction
9 that seems to be going on is basically
10 self-sustaining and that there is not
11 something like, you know, oxygen required
12 to keep the thing going. And I think that
13 the industry really, you know, needs to
14 know this and so I felt important to add
15 those two words that the overall
16 definition of the process.
17 Q And when you say the industry, you're
18 referring to the North American solid
19 waste industry?
20 A I would say the global solid waste.
21 Q The of which the Republic services is a
22 party?
23 A Correct.
24 Q Now, what you had read about in reviewing
25 literature was subsurface exothermic

Rough draft

1 reactions, what you readed to that to
2 create your acronym is the phrase
3 self-sustaining?

4 A Yes.

5 Q And that was designed to embrace a couple
6 of concepts one is it goes on for an
7 extended period of time and the second is
8 it creates heat without the presence of
9 oxygen?

10 A Correct.

11 Q Do you recall the specific literature or
12 source from which you drew just the
13 portion of your acronym which is SER or
14 subsurface exothermic reaction?

15 A It would have been from the numerous, you
16 know, Bridgeton correspondence and I
17 believe also a presentation that I
18 participated in by a couple of I believe
19 they were professors who were researching,
20 you know, these ongoing subsurface
21 reactions. I've been exposed to that SER
22 acronym numerous times and I can't
23 remember which was the first.

24 Q And the presentation you're referring to
25 just to get a good record of that, was a

Rough draft

1 westbound webinar that was put on by an
2 organization that was called the
3 Environmental Research and Education
4 Foundation EREF and the specific
5 presenters were Scott Luttich
6 L-a-u-t-t-i-c-h of GS Sentake (phonetic)
7 spelling consultants and Mort /PWA*RLS
8 (phonetic) who is a professor of the
9 University of North Carolina? Spellings
10 A I believe so, but I'm very poor at name
11 recollection.
12 Q Okay.
13 A So I'll -- if you're --
14 Q Do you recall EREF being the sponsoring
15 entity?
16 A I remember there was some organization
17 that was sponsoring. I don't remember the
18 details. I'm not familiar with it.
19 Q You remember, though, that it was a
20 webinar where you could see and hear?
21 A Yes.
22 Q Did you obtain a copy of the PowerPoint?
23 A I believe it's saved on our system.
24 Q Okay. Did you go back and review it from
25 time to time afterwards?

Rough draft

1 A I did review it once a twice, but not
2 recently.

3 Q And the general topic of the webinar was
4 sort of the current state of research and
5 some anticipated research concerning
6 landfills with elevated subsurface
7 temperatures?

8 A Yes.

9 Q Do you recall the names of any of the
10 other people who are involved in that
11 research project besides Mr. Luttich of
12 GS Syntech (phonetic) and Dr. /PWA*RLS of
13 North Carolina? Spelling

14 A No.

15 Q Have you researched out and contacted any
16 of the four professionals who are involved
17 in that research to just bounce ideas off
18 of any of them?

19 A No.

20 Q Have you gone back from time to time
21 during the preparation of your report or
22 since and looked at the PowerPoint from
23 the webinar just to refresh yourself on
24 information that you saw?

25 A I did during the writing of the report

Rough draft

1 and, but like I say not in the last three
2 or four weeks, but my recollection of it
3 is a little bit stale.

4 Q Sure. Did you know that -- well, I won't
5 ask that.

6 The acronym that those presenters
7 supplied for what they were describing is
8 described as both described orally during
9 the webinar and was described in the
10 PowerPoint as an SSR meaning subsurface
11 reaction?

12 A M'hmm.

13 Q And that's the extent of their acronym,
14 correct; is that right?

15 A I recollect subsurface reaction as well,
16 yeah.

17 Q And when you add or when you your acronym
18 includes the word exothermic, you're
19 simply adding the point that the reaction
20 being exothermic by definition produces
21 heat or gives off heat?

22 A Yes.

23 Q Do you know what's ahead for the research
24 team that presented or part of which
25 presented that webinar that you watched?

Rough draft

1 A I recollect they had some goal posts or
2 goals to undertake my recollection was
3 that there was quite a bit of field work
4 targeted to research and I believe some
5 very sophisticated modelling of the heat
6 balances and things if I recollect
7 correctly that that's sort of that's sort
8 of the sense of my recollection.

9 Q Did you regard the information supplied by
10 the webinar as demonstrating a high level
11 of scholarship and thought and
12 sophistication?

13 A Overall, yes.

14 Q Were there any things during the webinar
15 that you remember saying well, that's not
16 right, I disagree with that?

17 A I have to think about that. I have
18 recollections of like when I was reviewing
19 at the time of some things stood out in my
20 mind that weren't -- I wasn't 100 percent
21 sure that I agreed with, but I just have
22 that recollection that I don't now
23 specifically remember what they were.

24 Q Do you recall that some of the slides in
25 the PowerPoint -- excuse me some of the

Rough draft

1 slides in the PowerPoint presented during
2 that webinar related to chemical
3 reactions?

4 A Absolutely webinar.

5 Q And did you find those helpful in doing
6 your work?

7 A I would say yes.

8 Q Was there any particular disagreement
9 between either the information given to
10 you by Dr. Grace or the information given
11 to you by Mr. Foss-Smith, was there any
12 particular disagreement with them about
13 chemical reactions with what you saw in
14 that webinar?

15 A My recollection from what I saw in that
16 webinar was that there was not really a
17 clear explanation of what was producing
18 the actual heat in those reactions. That
19 was, I think, the fundamental thing that
20 sort of seemed to to me to not be very
21 clear.

22 Q You would have preferred a good, clear
23 simple answer to that question?

24 A Yes.

25 Q And this is by people who are presenting a

Rough draft

1 sophisticated and academic review of the
2 phenomenon, the same phenomenon at
3 Bridgeton Landfill just this past summer
4 of July of 2015?

5 MS. WHIPPLE: Objection. Form. Misstates the
6 witness's prior testimony.

7 MR. BECK:

8 Q Is that true or not true?

9 A Can you kindly repeat the question.

10 Q I can and maybe.

11 Did you see information in the
12 webinar that made you think that may be
13 applicable to Bridgeton Landfill?

14 A Yes, and my recollection is that in fact
15 there were some graphics presented in the
16 presentation that actually appeared to be
17 from -- from the Bridgeton site. I
18 believe that that looks like the South
19 Quarry area.

20 Q And your reaction to the discussion of the
21 chemical reactions during the webinar was
22 that it would be nice to have a better
23 answer than they were able to provide
24 during the webinar?

25 A Correct.

Rough draft

1 Q And was there an indication that on an
2 ongoing basis during this research effort
3 there would be some effort to clarify, if
4 possible, if it could be determined what
5 sorts of chemical reactions these are and
6 how they occur?

7 A I believe there was a desire to, you know,
8 understand the processes better. There
9 were still at the end of the day
10 unanswered questions and there was, you
11 know, a big push they were looking to
12 undertake to do that, yes.

13 Q Good.

14 In particular with respect to the
15 discussion of chemical reactions that may
16 be involved in elevated temperature
17 subsurface landfill problems such as
18 Bridgeton, did you find the discussion of
19 the chemical reactions to be sophisticated
20 and thoughtful in the webinar?

21 A Yes, they seemed to be, you know, very
22 knowledgeable, you know, and respected
23 individuals. I look to learn learn from
24 that webinar as much as they could.

25 Q And if they had another one next week you

Rough draft

- 1 would sign on to that one as well?
- 2 A Yes, as a professional in in B.C. landfill
- 3 fires, I feel that from what I'm learning
- 4 of these subsurface reactions that it's a
- 5 big problem that may not go away and I'm
- 6 certainly feel I'm now becoming at the
- 7 leading edge of knowledge so yeah, I want
- 8 to stay as current as possible in that.
- 9 Q Are you personally part of any sort of
- 10 ongoing research effort funded through
- 11 grants or otherwise to just study
- 12 generically the problem of elevated
- 13 temperature landfills with subsurface
- 14 heating events?
- 15 A No.
- 16 Q And of the first landfills in the United
- 17 States that you've done some consulting
- 18 on, are there any that you consider to be
- 19 analogous Bridgeton in the way that the
- 20 event occurred?
- 21 A Not in the U.S.
- 22 Q And what about in Canada? Have you seen
- 23 any there that seem to you that they are
- 24 similar to Bridgeton?
- 25 A Yes.

Rough draft

1 Q what landfill or landfills would those be?

2 A Just one and that would be Brady road
3 landfill in winnipeg.

4 Q If I refer to a catalyst for a chemical
5 reactions do you understand generally what
6 I'm talking about?

7 A Generally, but generally only.

8 Q Okay. Have you been aware of some
9 situations where landfills have had
10 self-sustaining long-term heat producing
11 reactions and people were able finally to
12 identify what specific waste in the
13 landfill was helping cause the heat to be
14 generated?

15 A Yes.

16 Q And so if I refer, for example, to
17 aluminum process waste or the phrase
18 aluminum dross, is that an example of
19 that?

20 A Absolutely.

21 Q I read something that caused me to think
22 that for, perhaps, some period of time and
23 to some extent you became involved with
24 the state of Ohio in reviewing some
25 information concerning the County-wide

Rough draft

1 landfill. Is that true?
2 A I may have been involved to some degree in
3 that. I definitely to some degree
4 familiar with County wide and I cannot
5 remember exactly the role of my engagement
6 in -- in that.
7 Q Did Thalhamer pull you in in some way?
8 A Again I would have to go through -- that
9 was not a major probably for our company.
10 Like it does not stand out in my mind, but
11 I believe that I may have had some very
12 minor role in it at some point.
13 Q Do you know if you ever went and saw it?
14 A I don't believe I was ever there, no.
15 Q Did you learn enough about it to know that
16 the self-sustaining exothermic reaction at
17 County-wide was above ground rather than
18 being in the subsurface of the ground?
19 Because the landfill was above ground?
20 A Yeah, I don't know the geography. What I
21 know about County-wide basically is
22 aluminum draw (phonetic) was basically
23 suspected as the primary cause of that
24 reaction /C/, that that's sort of the ...
25 Q Other than people from the Attorney

Rough draft

1 General's office and anyone who may have
2 simply been at the landfill when you went
3 out to Bridgeton Landfill or when you went
4 over to Champ Landfill, are there any
5 other people that you have talked to about
6 Bridgeton Landfill in connection with your
7 work on this lawsuit?

8 A The only other people that I have
9 discussed my main clients the City of
10 Vancouver in a general way about, you
11 know, the -- the importance of monitoring
12 for hydrogen and these self-sustaining
13 reactions is something to be taken
14 extremely seriously and to be looking out
15 for, you know, elevated temperatures in
16 wells and get on to dealing with them very
17 quickly to try and avoid something like of
18 that type of reaction. Because I believe,
19 from what I've seen, that it's something
20 that could happen at other facilities.

21 Q When you refer to the phrase elevated
22 temperatures are you talking generally
23 about an excess of 131 degrees Fahrenheit?

24 A Initially, yes, and then above the level
25 of normal oxidation temperatures or

Rough draft

1 aerobic decomposition which -- I'll have
2 to use Celsius if you forgive me because
3 it's 75 degrees Celsius is the other sort
4 of -- I think it might be 176 degrees
5 Fahrenheit, but I'm not 100 percent sure.
6 Q I get 167?
7 A Yeah, close.
8 Q It would be simply a conversion of 70
9 Celsius to Fahrenheit?
10 A Yes, yes.
11 Q And so the two temperature benchmarks that
12 you use are 131 and then 131 Fahrenheit
13 and 71 Celsius -- I'm sorry 75 Celsius?
14 A Yeah, it's in the 75 to 80 degree Celsius
15 range where typically aerobic bacteria
16 tend to die and when you go above that,
17 then I get really worried.
18 Q And that's because methane production
19 stops?
20 A Yeah, methane production generally stops
21 at the 55, maybe 60 degrees Celsius or
22 around 31 degrees Fahrenheit.
23 Q Have you found yourself in the position of
24 regularly on a day-to-day basis reviewing
25 the landfill gas monitoring data for any

Rough draft

1 landfill?

2 A No.

3 Q And if I suggest to you that there are
4 very few landfills that do not have some
5 wells above 131 degrees, do you know if
6 that's accurate or inaccurate?

7 A I would not know.

8 Q Now, going back to NSPS and I realize
9 let's be clear about it, that is a United
10 States concept, not a Canadian concept,
11 correct?

12 A M'hmm, yes.

13 Q And do you know who has the regulatory
14 responsibility for monitoring conformance
15 to those standards in the's U.S. and
16 particularly in the case of Bridgeton?

17 A Yeah, in the case of Bridgeton, my
18 impression was from reviewing the
19 documentation that it's the -- the County
20 environmental health department that was
21 sort of overseeing the -- the level
22 performance and then and there was some
23 oversight from MDNR as well.

24 Q Now, during the time that you identified
25 in your report that there were what you

Rough draft

1 describe as anomalous gas characteristics
2 whether it's temperature or composition,
3 during that time frame and leading up to a
4 particular date I'm going to use which is
5 December 22nd, 2010, did you ever see a
6 time when either the St. Louis County
7 Department of Health or the Missouri
8 Department of Natural Resources expressed
9 disagreement with any step the landfill
10 was taking to address what was being seen
11 in gas?

12 A Not that I'm aware of.

13 Q Did you see references that indicated that
14 the particular efforts that the
15 consultants hired by the landfill to
16 monitor gas were taking were, in fact,
17 specifically approved by regulatory
18 agencies?

19 A I believe so, that there were situations
20 like installing additional wells and they
21 ask for approval and then approval is
22 granted so yes, there seems to be
23 oversight on when things were done they
24 needed approval.

25 Q What about other activities with regard to

Rough draft

1 the particular wells that had anomalous
2 gas to them?

3 A In particular when we're -- I recollect
4 reviewing information about the hot wells,
5 that was something that was, you know, of
6 particular interest to me.

7 Q Sure.

8 A And that there was basically a requirement
9 for some exemption authorization to
10 operate those wells at elevated
11 temperatures and that was granted by the
12 County, yes.

13 Q Okay. And after that exemption was
14 granted by the County permitting the wells
15 to have higher operating values from the
16 standpoint of temperature, did you review
17 what the conditions of that authorization
18 were?

19 A Yes.

20 Q And what were they?

21 A My recollection and again it may not be
22 precise, but there was a need to continue
23 monitoring temperature and also to be
24 monitoring for carbon monoxide levels on
25 the wells and I believe it was a monthly

Rough draft

1 or weekly basis.
2 Q was it monthly or quarterly?
3 A My recollection is it was monthly but I'm
4 not 100 percent sure.
5 Q Do you know whether NSPS requirement or
6 any specific requirement applicable to
7 Bridgeton Landfill whether there was any
8 obligation to monitor for CO outside of
9 the of the context of that approval by the
10 St. Louis County Department of Health?
11 A I'm not aware.
12 Q Do you know if landfills in the U.S.
13 generally are required to monitor for CO
14 at all unless they get a specific
15 directive?
16 A I do not know.
17 Q And what about hydrogen do you know if
18 there's any requirement for a landfill to
19 monitor landfill gas for hydrogen in the
20 United States except in the instance of a
21 particular requirement imposed?
22 A I do not believe so. I'm not aware of
23 any.
24 Q Now, with respect to one particular well
25 that you call out in your report in your

Rough draft

1 mind as having importance, GEW 67?
2 A M'hmm.
3 Q If I want to ask detailed questions about
4 sort of the history of GEW 67 and the
5 monitoring data after the high operating
6 value was approved, should I ask you or
7 planned or both you either Mr. Abedini or
8 neither?
9 A I would say you can start with me and --
10 and if I'm not able to answer, you can
11 follow up with Dr. Abedini.
12 Q Now, do you recall the date of the
13 approval of the higher operating value for
14 GEW 67 and the other wells?
15 A I would have to look in my -- hopefully
16 it's listed in my table. I don't off the
17 top of my head recollect. It was sometime
18 around 2008, 2009, but I would have to
19 look it up.
20 Q And the table refers to the chronology
21 that's contained in the report?
22 A Correct I believe I have some reference in
23 there and I believe there is also some
24 words in my report that I would have to
25 review to answer your question if you

Rough draft

1 would like me to do so.

2 Q we'll come back to that, but let me
3 establish just another date and that is do
4 you know that Bridgeton Landfill made a
5 report to the Missouri Department of
6 Natural Resources around December 23rd,
7 2010 saying we're having a problem here?

8 A Yes, I believe -- I don't believe I read
9 the report, but I am aware at that time
10 there was disclosure to the regulators
11 that there is some problem going on.

12 Q And if I tell you that the date of the
13 approval of the higher operating values
14 for including, among others, well GEW 67
15 was December, 2008, so two years previous?

16 A Yes.

17 Q Does that sound about right?

18 A That would sound about right.

19 Q And what I would like to talk to you about
20 is sort of what happened during those two
21 years.

22 A M'hmm, yes.

23 Q What did you do to appropriate for your
24 deposition so that you could give me
25 complete and accurate testimony?

Rough draft

1 A I primarily reviewed my report as much as
2 I could and had one day discussion with
3 Peggy and Andrew about how depositions
4 usually work and that's about what I did.

5 Q Were you given any practice
6 cross-examination?

7 A Yes.

8 Q Where they asked you questions and --

9 A Yes.

10 Q And pointed out flaws in the way you might
11 be answering something?

12 A Correct.

13 Q They were a lot meaner than I was, weren't
14 they?

15 A Yes, so far.

16 Q That's a fair observation.

17 So let's talk about that two-year
18 period and specifically well GEW 67.
19 Under the high operating value approval
20 from St. Louis County, you said one of the
21 things that the landfill was required to
22 do was periodically to monitor the wells
23 named in the approval for carbon monoxide?

24 A Correct.

25 Q And there are a couple of different ways

Rough draft

1 a person can monitor a gas extraction well
2 for carbon monoxide, right?

3 A Yes.

4 Q One is through field instrumentation where
5 you simply take a reading in the field and
6 see what it says, right?

7 A Yes.

8 Q Do you know what that field instrument is
9 called?

10 A Yeah, it's basically there are a number of
11 different field instruments that can be
12 used. The most common ones being four
13 face gas analyzer and that's usually
14 referred to as a PID fold detector. The
15 jam device spelling also has a sensor that
16 reads carbon monoxide or at least provides
17 indication in some units, and this is a
18 question I would refer to Dr. Abedini as
19 probably being more familiar with that.

20 And then there's the Gastec tubes
21 that can be used to do those readings.
22 But usually the screenings are done with
23 some form of gas analyzer tube.

24 Q Did you say Gastec tubes?

25 A Yeah, some are referred to as /TKRA*EUG

Rough draft

1 tube it's kind of more of a generic name,
2 but the ones that are commonly used in the
3 industry I believe are called Gastec
4 spelling /TKRA*EUG spelling.

5 Q A second way that one can monitor the
6 carbon monoxide concentration of the gas
7 flow at a gas extraction well is by
8 collecting a sample and sending it to a
9 laboratory for analysis?

10 A Correct.

11 Q And how is that sample collected,
12 preserved and taken to the lab?

13 A Yeah, that is something that I'm not a
14 specialist on, so I would say there are
15 some procedures to be followed in general,
16 but it's not something I regularly
17 practiced.

18 Q There's a page in your report, I think
19 it's page 99 but I'll turn to it after a
20 while, /(there was a table created of
21 some gas extraction well test data that
22 were collected by your company on July
23 22nd, 2015 at your visit to the landfill
24 with notes on the right-hand side
25 describing your impressions, from it,

Rough draft

1 right?

2 A I'll turn to that and just if I could
3 refresh my mind.

4 Q Let's turn to that, being fair.

5 A We really need our glasses on that one,
6 but yes, I have a recollection of that
7 table.

8 Q I actually have a secret weapon. On my
9 iPad I've got a picture of this pdf and
10 it can be pulled out to a very large size.
11 Have I described this field and lab data
12 as well as the Bridgeton split sample data
13 essentially for the same samples and on
14 the right-hand side a series of notes
15 prepared by you concerning your
16 impressions?

17 A Correct.

18 Q And everything on this page, page it's
19 between page 98 and 100 I call it 99
20 because that's what it is in the pdf
21 version, but everything on this page is
22 your work?

23 A Is sorry?

24 Q Is your work?

25 A I would say yes, I would have written

Rough draft

1 that.

2 Q Okay. You may have had some
3 interpretation help with Ali Abedini?

4 A Yes.

5 Q But it's your piece of -- it's your work
6 product. You wrote it?

7 A Yes.

8 Q And so far as you know today, the
9 information that you placed in your notes
10 is true and accurate?

11 A Correct.

12 Q And the value as expressed in this the
13 table likewise are true and accurate?

14 A I believe so, yes.

15 Q With respect to now let's go back to what
16 we were discussing a moment ago which is
17 this period of time between December, 2008
18 when the higher operating value was
19 approved for some wells including GEW 67
20 and December 2010 two years later when the
21 report was made to DNR that there was a
22 problem at the landfill. During that
23 period of time have you now seen all of
24 the carbon monoxide data both field and
25 laboratory, that were collected by the

Rough draft

1 landfill and submitted to the regulatory
2 agencies?

3 A I have seen extensive amount of data. I'm
4 not sure if it's all of it, that -- what's
5 collected over that period.

6 Q There are a series of monthly reports that
7 were provided to Bridgeton Landfill by a
8 consultant that it had hired, a company
9 called MCC?

10 A Yes.

11 Q which stands for monitoring controlling
12 compliance Inc.?

13 A Yes.

14 Q with respect, among other things, too, the
15 CO monitoring of well 67. Have you read
16 those?

17 A Yesterday.

18 Q You've read the whole set you believe?

19 A I have reviewed I believe all of them, but
20 I cannot, you know, verify that -- I
21 definitely went through them and tried to
22 track the evolution of the elevated carbon
23 monoxide readings.

24 Q okay. Generally speaking, when you
25 reviewed the data collected by your

Rough draft

1 company in July of 2015 at Bridgeton
2 Landfill, one of the benchmarks that you
3 used to decide whether a well had been
4 impacted by the reaction or not was carbon
5 monoxide value?

6 A True.

7 Q And essentially the benchmark you used is
8 that if the carbon monoxide was anywhere
9 from non-detect to less than 500 parts per
10 million, you treated that as not impacted.
11 If it was above 500 parts per million,
12 then you treated it as impacted and then
13 used it as another benchmark to describe
14 it as either moderately or severely,
15 correct?

16 A Yes.

17 Q Is that a typical sort of benchmarking
18 that your company in evaluating carbon
19 monoxide data from landfill gas?

20 A Yes.

21 Q And so for the deckss of carbon monoxide
22 at a couple of wells but at 500 parts per
23 million your conclusion were those wells
24 were unimpacted by the reaction?

25 A Basically I feel that any level of carbon

Rough draft

1 monoxide is is a sense for caution. It
2 can be present in the subsurface from
3 other situations I think or it's
4 encountered at low levels or the analyzers
5 can typically chemical analyzers will
6 detect for example if there's some
7 hydrogen present they may give a false
8 reading.

9 Q There can be false positives?

10 A Right, and so I feel that you want to have
11 fairly high levels of CO typically 500
12 parts per million before just to try to
13 read out those ppm false positives.

14 Q I want you to be clear about one thing
15 that is when you wrote this report Exhibit
16 1 both in the text and in that table?

17 A M'hmm.

18 Q where you had a CO level of less than 500
19 parts per million the words you used were
20 not impacted, correct?

21 A Let me just check what it says here.

22 Q Sure.

23 A Yeah, green basically not impacted methane
24 yes, CO less than 500, so that's true.

25 Q Thank you. Now, during the entire time

Rough draft

1 this two year period of time between 2008
2 and 2010, December of 2008 to December of
3 2010 during which the landfill had been
4 granted permission to operate the wells at
5 higher temperatures but was required to
6 monitor for carbon monoxide, of all the
7 wells that were monitored for carbon
8 monoxide at the landfill before December
9 of 2010, what is the total number of gas
10 extraction wells that ever have above that
11 benchmark level of 500 parts per million?

12 A I recollect that there was reporting of,
13 you know, some wells and I can't remember
14 the exact number that had levels of 600
15 and I think up to 750 and maybe even a
16 thousand ppm. A small number specifically
17 I would have to go back and review exactly
18 which wells they were.

19 Q You would have to look at the historical
20 information?

21 A Yes.

22 Q Information you were given before you
23 wrote your report?

24 A Yes.

25 Q Let me ask you if this is the simple

Rough draft

1 answer to my question. Isn't the answer
2 to my question, one isn't the answer to my
3 question that between December of 2008
4 right up until December of 2010 there was
5 a single well at Bridgeton Landfill that
6 ever went above 500 parts per million?

7 A I would have to review the information.

8 Q The reason that you focus in your report
9 on well GEW 67 is that is the well you
10 were describing that you said was 600 and
11 then was 700?

12 A M'hmm.

13 Q And I know you said it was a thousand
14 we're going to cover that, but that's the
15 well you're talking about, isn't it?

16 A That's the definitely the one of focus,
17 yes.

18 Q And you criticize either the landfill or
19 its consultants then or both in connection
20 with the way that they managed well GEW 67
21 during that two-year period for the
22 portion of the period during which they
23 knew there was CO it was above 500 ppm and
24 you say things in your report that
25 criticize the management of that well,

Rough draft

1 correct?
2 A Correct.
3 Q And the principal thing that you criticize
4 is is that rather than turning off the
5 well, de-commissioning the well if you
6 will, the landfill instead increased the
7 pull on the well and pulled more into it
8 and that's what you criticize, right?
9 A Correct.
10 Q And, in fact, it's your opinion that that
11 if I'm reading it correctly in your report
12 what you expressed as your opinion is that
13 this overpull on well GEW 67 after they
14 had seen the 500 plus ppm was what started
15 this whole reaction in the first place?
16 A I believe so, yes.
17 Q Now, how did you know they overpulled the
18 well during that period of time?
19 A Basically, looking at the records and I
20 would say that it was not the only well
21 that was overpulled.
22 Q I don't care about that because what I do
23 care about tracking down here is you have
24 said the landfill's problems started at
25 GEW 67 and it started because the landfill

Rough draft

1 overpulled on that well during the period
2 of time when they knew they had the carbon
3 monoxide.

4 A M'hmm.

5 Q And I've got to focus on that. That's all
6 I care about.

7 A Okay.

8 Q How do you know that that well was
9 overpulled during that time frame?

10 A Basically looking at the pumping record
11 for that well where you look at the oxygen
12 and vacuums that were applied to it that
13 basically showed that the well continued
14 to be active and.

15 Q Because you would have preferred they
16 turned the well off?

17 A Yes.

18 Q Once they realize that they've got some
19 temperature and some CO you want them so
20 that they don't want oxygen into the waste
21 mass?

22 A Correct.

23 Q And whatnot to do is pull even harder on
24 that well and have a risk of pulling
25 oxygen to the waste mass where there is

Rough draft

1 already elevated temperature and where
2 there is already some CO being detected?
3 A True.
4 Q And isn't that really kind of sort of your
5 strongest of the landfills at actions
6 prior to 2010?
7 A Yes.
8 Q Is it fair to call it your principal
9 criticism?
10 A It's one of the principal criticisms,
11 yesterday.
12 Q Now, during that time between December of
13 2008 and December of 2010 do you know when
14 it was that the first carbon monoxide test
15 that came in in excess of this benchmark
16 500 parts per million was reported to the
17 landfill?
18 A If I could turn to my table that --
19 Q That would be fine.
20 A That would help.
21 Q And you're talking about your chronology?
22 A Yeah, I believe it's somewhere in 6, but
23 you may -- maybe you'll help me find it
24 faster.
25 Q I can. I'll let you give me the page and

Rough draft

1 then we'll turn to it?
2 A Give a second.
3 A Yes, Table 6-1.
4 Q Can you tell what page?
5 A It appears to be on page 44 of the report.
6 Q Got it. And that is a chronology prepared
7 by your company?
8 A Yes.
9 Q -- to describe sort of historical events
10 over time with respect to Bridgeton
11 Landfill that you identified from records?
12 A Yes.
13 Q Now, making sure this is clear, the first
14 time you've ever stepped foot on Bridgeton
15 Landfill was in July of 2015, this year?
16 A Yes.
17 Q You had never been to Bridgeton Landfill
18 during the events that are recorded on
19 this event log?
20 A And so your only source of information
21 events that are recorded on the event log
22 you read the documents that were
23 interpreted to provide these facts.
24 A Yes.
25 Q If I could ask you to turn to or stay

Rough draft

1 object page 44 of Exhibit 1 of your
2 report, this event log that your company
3 prepared, do you see the pretty light
4 green shaded portion of the time period
5 that covers the time from May, 2009
6 through December 31 of -- through to
7 December of 2009?

8 A Yes, I do.

9 Q And why is that green?

10 A Basically what it says for green is
11 aerobic deposician high temperature.

12 Q And I take it from your color scheme that
13 that is better than being orange or red
14 which it becomes later in your event log?

15 A In terms of better, better I would say
16 different composition.

17 Q If it had stayed green we wouldn't be
18 here, is that your position?

19 A Quite likely that aerobic landfills are
20 something I generally recommend people do
21 not operate, but, you know, some things do
22 end up being aerobic situations and those
23 are at risk of fire, but yes, they are not
24 a fire or a SSSER so from that perspective
25 probably is better.

Rough draft

- 1 Q And that's basically the year 2009?
- 2 A Yes, looks like that's basically 2009.
- 3 Q And the events that are described in the
- 4 event log for those dates in the green
- 5 shaded section with respect to 2009, if
- 6 you look at just the specific texts of the
- 7 events, those come out of these monthly
- 8 MCC reports, don't they?
- 9 A Yes.
- 10 Q Now, I know that you read the deposition
- 11 of mike lam, right?
- 12 A Right.
- 13 Q When you read the deposition of mike lam
- 14 you saw that he was questioned about the
- 15 reports from which you extract this
- 16 information?
- 17 A Yes.
- 18 Q Do you remember his testimony that was
- 19 given in respect of those reports?
- 20 A In a fuzzy sort of manner.
- 21 Q Did you -- was there anything that Mr. Lam
- 22 said about those reports and the events
- 23 that they record that you rejected as
- 24 being not accurate or plausible?
- 25 A No.

Rough draft

1 Q Do you recall --
2 A Except, if I may.
3 Q Please.
4 A I seem to remember one statement that said
5 that the first time that he encountered
6 something was, like, December 2010 and
7 that was like the worst or the day that
8 changed his life or whatever and it seemed
9 to be that, you know, he had previously
10 been sort of flagging CO and subsurface
11 oxidation for an extended period of time
12 and so there seemed to be an
13 inconsistencies in that comment.
14 Q I know I know what you're referring to.
15 Do you think he read those reports?
16 A There was, again, this is fuzzy. There
17 was a guy named Jared (phonetic) and I
18 believe he wrote some of those reports
19 based on Mr. Lam's data and there was some
20 discussion of that. I don't remember the
21 details.
22 Q And if I refer to the name Jared roamin
23 spelled just like roamin less us?
24 A Yes.
25 Q Now, let let?

Rough draft

1 Q If you the Attorney General read you for
2 your review did you review it?

3 A I tried to review by no means I probably
4 saw only 10 percent of the vast amount of
5 information I was given.

6 Q Because you didn't have the time to get
7 through it all?

8 A Yes, and the other challenge was that
9 every time I had essentially Bates number
10 but not anything else, and so like to
11 actually try and find what stuff was
12 about, like I would go into a file that
13 was just air quality data and it took a
14 massive amount of time to try to filter
15 what was actually pertinent, so that was a
16 big time limitation, you know, in my
17 ability to review the key data.

18 Q would you have liked to have been able to
19 review all of the documents that the
20 Attorney General provided to you before
21 reporting?

22 A That would have been a preference, but
23 within my time constraints, that I had
24 facing, you know, I had to deal with other
25 clients and other deadlines, I did the

Rough draft

1 best I could within the time I had.
2 Q Have you gone back and read the other 90
3 percent of it since writing your report?
4 A No.
5 Q Is that because you didn't want to or you
6 weren't instructed to? What's the reason?
7 A Basically I did not feel that essentially
8 a time management thing that just other
9 pressures of my regular business took over
10 and I felt that my job essentially on
11 completion of the report, you know, is at
12 a hiatus and I would be looking for
13 direction on what else I need to do.
14 Q So essentially you stopped work when you
15 wrote your report?
16 A Predominantly other than reading, you
17 know, when there's a flash on Google about
18 the site, I kind of of interest I try to
19 stay current on what's in the media.
20 Q And what we're talking about here for the
21 jurors who may or may not know about it is
22 that you set what is referred as a Google
23 alert probably with the name Bridgeton
24 Landfill in it and if a news story is
25 picked up by Google's web crawler as being

Rough draft

1 posted to the internet it will send you
2 a little e-mail letting you link to that
3 story and you can go read it?

4 A It's more general than that. Basically I
5 have an ongoing Google alert on landfill
6 fire and so anything that has landfill
7 fire pops up and that's basically I sort
8 of try to stay globally of what's going on
9 in the world for landfill fires.

10 Q Is that for marketing purposes or for
11 intellectual curiosity?

12 A Generally for curiosity and the odd
13 situation like, you know, if there's a big
14 fire anywhere in the world if I'm if I
15 feel I could handle, you know, somehow
16 I'll try and follow up and be of
17 assistance if warranted.

18 Q You'll offer your assistance?

19 A Yes.

20 Q Did you offer your assistance with respect
21 to Bridgeton?

22 A I have a recollection that I did.
23 Initially, and I don't have a recollection
24 of the names or anything, but both -- I
25 believe initially to the landfill owners

Rough draft

1 and then subsequently to the fire
2 departments and I feel I had an at one
3 point a discussion with one of the fire
4 department members and it didn't lead to
5 anything.

6 Q Are you talking about Republic Services or
7 Bridgeton Landfill again?

8 A Again, this is probably several years ago
9 and it's really fuzzy in my mind. I
10 remember based on, you know, reading one
11 of these articles I remember gee, you
12 know, maybe we could be of help me and I
13 followed up and now I can't recollect
14 whether it was within the fire service or
15 the company or both. It's I just do
16 remember it one or possibly two points I
17 tried at at I tried to establish contact
18 and also one of the companies that I work
19 with called Hell Fire services they're a
20 fire suppression company sort of jointly
21 trying to help on the project.

22 Q But you don't have a specific memory of
23 offering your services to anyone from the
24 landfill. It could have been the fire
25 department instead?

Rough draft

1 A Yeah, I believe it -- I can't remember
2 now. I do have a recollection that I
3 talked to somebody in the fire service and
4 I just do not have a recollection of
5 whether or not I also contacted somebody
6 at the landfill.

7 Q If I gave you the name Levanchy
8 (phonetic), is that who you contacted?

9 A /(spelling.

10 A Unfortunately I do not remember the name.
11 /(.

12 A It was -- yeah, I know that he is sort of
13 the Deputy in the Pattonville fire
14 department but whether that's the
15 gentleman I talked to I can I can't
16 remember.

17 Q Was that a phone call or e-mail when you
18 offered your services?

19 A Basically I initially, again, the exact
20 former communication I think initiated a
21 phone call with the fire department and
22 then they sort of put me in contact with
23 the person who it may have been and I
24 think we played phone tag a bit and I
25 believe we talked at the time but it's

Rough draft

1 again over in a year ago it's.
2 Q It's vague old and nothing came of it?
3 A Right. That's a pretty good summary of
4 what happened.
5 Q Now, I want to go back to this time period
6 between December, 2008 and December, 2010.
7 I know that you said you read Mr. Lam's
8 deposition. I know you had the name Jared
9 Romaine. Do you know if Mr. Romaine ever
10 gave sworn deposition testimony?
11 A I do not. I was surprised I did not come
12 across it and that's one of the ones I
13 would have been interested in reading, but
14 I did not come across it.
15 Q And there's also a gentleman whose name is
16 Chad Miller who is higher than him in his
17 company or MCC compliance do you know
18 whether Chad Miller gave a deposition?
19 A That's the first time I have a
20 recollection. I may have read the name
21 Chad Miller. I do not have a recollection
22 of coming across that name.
23 Q And you haven't read his deposition?
24 A No.
25 Q You didn't know he gave a deposition the

Rough draft

1 day you were watching the webinar on
2 elevated landfill temperatures?

3 A I did not know.

4 Q Has anyone described for you just so that
5 you would have the full picture of the
6 facts what testimony Mr. Romaine and
7 Mr. Miller gave during their depositions
8 with regard to these reports that you
9 reviewed?

10 A No, I was not aware that either of them
11 gave depositions.

12 Q And so when you dealt with the Attorney
13 General's office when they supplied
14 information for you to base your reporting
15 on, that information did not include any
16 deposition testimony of either Jared
17 Romaine or Chad Miller of CCC?

18 MS. WHIPPLE: Objection. Assumes facts not in
19 evidence and due to Defendant's own
20 behaviors.

21 MR. BECK: What does that mean.

22 MS. WHIPPLE: I don't think we had it then
23 either. I don't think we had those
24 transcripts at that time.

25 MR. BECK: Before September 2nd.

Rough draft

1 MS. WHIPPLE: I don't think so.

2 MR. BECK: Oh, I think so.

3 MS. WHIPPLE: Well, we'll just leave the
4 objection and you go ahead with your
5 question.

6 MR. BECK:

7 Q Well, let me ask you first of all to
8 answer that question and that is and the
9 objection will remain pending against my
10 rephrasing or restating the question, but
11 that is did the Attorney General's office
12 ever give you testimony of Jared Romaine
13 or Chad Miller of MCC at any time before
14 you wrote your report?

15 A Not that I'm aware of, however, like I
16 say, it may be buried in this one of these
17 Bates number files that's in my system and
18 I did not see.

19 Q How would you find that out?

20 A I would have to search through every file
21 and see if it's there.

22 Q Is it on your network?

23 A It's on a bunch of zip drives that were
24 provided to us.

25 Q And did you copy them on to your laptop?

Rough draft

1 A I copied the reports that I felt were of
2 significance object to my notebook.

3 Q How many flash drives were there from the
4 Attorney General's office?

5 A I believe there was five or possibly one
6 more so somewhere five or six.

7 Q And so we're going to change the tape in
8 just a minute and let me just one last
9 question to tie this off and that is at
10 any time since your report was written on
11 September 2nd, has the Attorney General's
12 office shared with you either the document
13 itself or information about the content of
14 the depositions sworn testimony of Jared
15 Romaine and Chad Miller?

16 A There is a possibility that on the latest
17 disk drive it may be there. I -- I do not
18 recollect seeing it.

19 Q If it is, you don't remember it and no one
20 has flagged it for you?

21 A No.

22 MR. BECK: Why don't we change the tape.

23 THE VIDEOGRAPHER: Going off the record. The time
24 is 10:50.

25 (PROCEEDINGS RECESSED AT A.M..)

♀

Rough draft

1 (PROCEEDINGS RESUMED AT A.M.) test test
2 test

3 THE VIDEOGRAPHER: We're back on the record. Here
4 begins media Unit Number 2 the deposition
5 of Tony Sperling. The time is 11:00a.m.
6 /KWRAO.

7 Q Mr. Sperling, before the break we were
8 talking about a gentleman whose named is
9 Jared Romaine. Did you realize that
10 Mr. Romaine was, in fact, the author of
11 these monthly reports that you've
12 described in your event log?

13 A Yes, I have a recollection in the
14 engineers dids that I read about that.

15 Q And just for the record to avoid one
16 deposition we produced Mr. Romaine's
17 transcript to the Attorney General's
18 office on July 8, 2015.

19 Now, my question is: Has anyone
20 called to your attention to Mr. Romaine's
21 sworn testimony is contrary to your
22 description of the reports you wrote?

23 A No.

24 Q You actually did read the reports, though,
25 in the section where it refers to

Rough draft

1 subsurface reaction oxidation you read
2 chunks of the?
3 A I read a massive amount of information. I
4 do recollect reading the reports, so yes,
5 I believe I read the text.
6 Q Did somebody help you with that task the
7 task of creating this event log from those
8 reports or is that something you did
9 yourself?
10 A No, that was 100 percent my effort.
11 Q And so to the extent you are describing
12 that information that has to be coming
13 from reading them with your eyes?
14 A Correct.
15 Q Now, I want to stick for a while with this
16 one well that was ever above 500 parts per
17 million carbon monoxide prior to December
18 22nd, 2010, well 67, do you know if the
19 nomenclature for the well ever changed
20 during the time frame December 8 to
21 December 10?
22 A No, I -- I'm not sure of whether it did or
23 not, no.
24 Q Do you recall that some wells at Bridgeton
25 Landfill have had a number plus a letter?

Rough draft

1 A Yes, like usually the letter R for
2 re-drill or something.
3 Q Do you know whether or not well 67 had a
4 designation of R during any of that time?
5 A I believe it did now that you mention it,
6 but I'm not 100 percent certain. I would
7 have to look at the data.
8 Q Do you remember, do you know what it means
9 when a well is redrilled?
10 A Yes, as far as I understand it is when the
11 initial well gets compromised for some
12 reason and has to be abandoned basically
13 there's another well drilled nearby.
14 Q And you don't know whether that happened
15 with well 67 or not?
16 A No, I do not.
17 Q Do you recall from reading any of the MCC
18 reports for this period of time from
19 December of 2008 through December, 2010
20 whether there was any period of time
21 during which well 67 was shut off or
22 de-commissioned?
23 A It does not stand out in my memory.
24 Q If you think about two things you could do
25 to a well to change its condition, one

Rough draft

1 thing you could do is pump it more
2 aggressively and make it draw harder,
3 right?
4 A Correct.
5 Q The opposite of that would be to
6 de-commission it or shut off the pumping?
7 A Yes /(. Spelling.
8 Q And do you know if during the period of
9 time that you criticized the landfill for
10 pumping well 67 harder whether it was
11 actually shut off or de-commissioned?
12 A Yes. Just looking at the record that I
13 had for well 67 that's what I based my
14 opinion on, whether that includes a second
15 well or -- I was not aware of that.
16 Q Okay. That's what I was getting at. You
17 criticized the landfill for pumping too
18 hard on that well knowing that they've got
19 temperature and carbon monoxide and that
20 would be the opposite of shutting off the
21 well, right?
22 A
23 Q Pumping it would be the opposite of
24 shutting it off?
25 A True.

Rough draft

1 Q And you didn't know if they shut it off
2 you didn't know they shut it off, right?

3 A Review.

4 Q And if they did shut it off you didn't
5 know how long they shut it off or for how
6 long?

7 A True.

8 Q Is it possible that a gas extraction well
9 that is required by a permit to be
10 monitored periodically could be inactive,
11 shut off, not working except when it's
12 required to be tested monthly for NSPS
13 criteria and then they turn it on to test
14 it and then turn it back off? Is that
15 possible?

16 A I would say it is possible if that was
17 something that was being done. I had no
18 knowledge of that. I assumed that it was.

19 Q Pumping the whole time?

20 A Pumping the whole time and to expand on
21 that I would say that if that was being
22 done it would be not best practice in that
23 in order to get good representative
24 samples of you would really want to be in
25 a continuous state of operation, so I

Rough draft

1 would say if a well is turned off it
2 should be left off and not sampled instead
3 of being turned on and taking little
4 samples of stale gas in the well port.
5 Q well what you would want to do if you're
6 going to take a sample was to let the well
7 have flow for enough time that you get a
8 condition that is more representative of
9 the gas in the waste mass?
10 A Yes, like a purging type scenario,
11 correct.
12 Q And that doesn't mean it has to run for
13 four days. You may be able to get that
14 condition going in a period of minutes?
15 A Yeah, I'm not sure if I would leave it
16 just for minutes but for a little bit more
17 extended time, but again on something like
18 that I would defer to Dr. Abedini.
19 Q Okay. I'm not asking this to be
20 impertinent. I read it on your website.
21 On website Dr. Abedini is referred to as a
22 Ph.D. Canadian data. In your report he's
23 referring referred to as doctor. which is
24 he now?
25 A He is a doctor now.

Rough draft

- 1 Q when did he become one?
- 2 A It would have been about six months ago or
3 so. And so we need to update our website
4 for sure.
- 5 Q Okay. And I want to talk to you now about
6 how you -- I want to go back to the
7 question of how you knew that a particular
8 well was put under increased vacuum. Is
9 that by looking at the data that are
10 contained in the spread sheet that was
11 provided to you as representing a dump
12 from the SCS database?
- 13 A Basically Dr. Abedini generated in an
14 appendices and so I was looking at
15 essentially the vacuum rate there's a bar
16 graph. There was basically like oxygen
17 levels and one of the graphs. That was
18 basically what I was looking at /(. I did
19 not specifically look at the numbers in
20 the spread sheet.
- 21 Q So to be simple but fair about the
22 division of labor on that issue, he
23 graphed the data and you worked from the
24 graphs?
- 25 A Yes. My review was pretty much restricted

Rough draft

1 to the visual graphs that were presented.

2 Q And the visual graphs that Dr. Abedini
3 prepared based on the data that did come
4 out of that spread sheet from SCS?

5 A Correct.

6 Q And so if there is a depiction of vacuum
7 or flow that Dr. Abedini graphed it would
8 be based on the data contained in that
9 spread sheet?

10 A Correct.

11 Q And the inference that you drew you
12 understand that wells are tested
13 periodically?

14 A Yes.

15 Q And so if a well is tested on March 1st
16 and a well is tested again on April 1st
17 but it's not tested in between, then the
18 graphing depicts that the conditions of
19 the landfill are continuous between the
20 first date and the second date, correct?

21 A Correct.

22 Q And so if a landfill gas well was turned
23 on, allowed to establish flow, tested and
24 turned off, all in the same day on March
25 1st in my example and then it's turned on,

Rough draft

1 allowed to establish flow, tested and
2 turned off again on April 1st, then the
3 graphing that you examined and that led to
4 your conclusions would make it look like
5 the well is on the whole month?
6 A Correct.
7 Q And you looked at Dr. Abedini's graphs of
8 the data based on the graphs you braced
9 conclusions that you drew in the report
10 including with respect to well 67 the
11 conclusion that it had been overpulled?
12 A Correct.
13 Q And that conclusion was based on vacuum as
14 expressed in what inches of water?
15 A I believe so, yes.
16 Q Okay. And oxygen?
17 A Predominantly in balanced gas readings as
18 well.
19 Q Okay. By the way, do you know where you
20 say in your report more than once that the
21 NSPS requirements limit balanced gas to 20
22 percent?
23 A Yes.
24 Q Is that false?
25 A Not to my knowledge.

Rough draft

1 Q Is it true to your knowledge?

2 A I believe so, yes.

3 Q Have you read something that limits
4 balanced gas in the NSPS regulation?

5 A My recollection of when I was reviewing
6 that NSPS guidance that there was a
7 recommendation to be operating at less
8 than 5 percent oxygen and less than 20
9 percent methane. That's my recollection,
10 yes.

11 Q I know the oxygen is a requirement. Is
12 there a requirement like that for balanced
13 gas?

14 A I believe so, yes.

15 Q How is balanced gas measured in the field?

16 A Basically it is measured typically as a
17 number that the GEM determines based on a
18 subtraction of, you know, the carbon
19 dioxide and the methane and the oxygen
20 readings that the instrument gets and the
21 difference is basically reported as a
22 balanced gas number.

23 Q And balanced gas can include nitrogen. In
24 fact, it typically would be predominantly
25 nitrogen?

Rough draft

- 1 A Correct.
- 2 Q And in a landfill producing hydrogen, the
3 balanced gas could include hydrogen?
- 4 A Correct.
- 5 Q Now, let's say that your field technician,
6 your Michael Lam if you will --
- 7 A Yes.
- 8 Q -- is out testing a gas extraction well
9 for NSPS compliance on a monthly basis and
10 you look at the results for a particular
11 well and you see that it's 21 percent
12 oxygen and 79 percent nitrogen, that tells
13 you something very specific, doesn't it?
- 14 A I would say yes, it does.
- 15 Q And what it tells you is that the intake
16 by the field instrument is not landfill
17 gas from the landfill, it's air from the
18 atmosphere?
- 19 A Correct.
- 20 Q And the way you know that it's air from
21 the atmosphere is that ratio of 79 21 or
22 approximately 4 to 1 is the ratio of
23 nitrogen and oxygen in the ambient air?
- 24 A Yes.
- 25 Q And when you refer to 5 percent and 20

Rough draft

1 percent, it's just an expression of that
2 approximate ratio, 5 percent oxygen versus
3 20 percent nitrogen that is just an
4 expression of that approximate same ratio
5 in the atmosphere?

6 A Let me think about that. Yeah, that ratio
7 is correct yeah, I haven't thought of it
8 that way.

9 Q Okay. You didn't know that's where it
10 came from?

11 A No.

12 Q Okay. Now, if the NSPS requirements allow
13 5 percent of the landfill gas in the
14 landfill that you measure with the device
15 to be oxygen?

16 A M'hmm.

17 Q And 20 percent to be nitrogen, that means
18 its legal for a fourth of all the gas in
19 this the landfill to be ad atmospheric,
20 right?

21 A Correct.

22 Q Now, it is literally impossible for a gas
23 extraction system that is overpulling on a
24 landfill to overpull more than a quarter
25 of the entire gas in the waste mass from

Rough draft

- 1 the atmosphere. There's no overpull that
2 will do that, is there?
- 3 A In terms of overpulling more than 25
4 percent --
- 5 Q Of all the gas in the landfill being
6 atmospheric.
- 7 A I would say it could happen.
- 8 Q Really?
- 9 A Yes.
- 10 Q If you overpulled maybe half the wells?
- 11 A Sorry, are you saying on the whole gas
12 field or a specific well? I may have
13 missed something in your whole question.
- 14 Q I'm talking about the entire the waste
15 mass mass in the?
- 16 A Oh, so you're saying like the entire gas
17 in the gas extraction plant being 25
18 percent atmospheric?
- 19 Q Sure.
- 20 A Yeah, that would be very unlikely, almost
21 impossible to happen.
- 22 Q You just couldn't overpull that much?
- 23 A Yeah, you would be doing something pretty
24 radical.
- 25 Q You would never expect to see that?

Rough draft

1 A Right.

2 Q Now, I want to stay with because you've
3 made a big deal of well 67, GEW 67 in your
4 report. According to you, that's where
5 the problem starts and so I want to stay
6 with that.

7 A I would actually you've repeated that a
8 number of times and my recollection of my
9 report is that I believe that I flagged
10 two wells that seem to initiate the SSSER.
11 well 12A rings a bell in my mind as a key
12 well as well and I believe was actually
13 well 66 that was the other well where I
14 felt that the SSSER actually, so it
15 depends what -- where you're trying to go.

16 Q why don't you try to go to page 51 of your
17 report, Exhibit 1. Do you see Section
18 7.3?

19 A Yes.

20 Q And do you see in the third line you wrote
21 on December 10, 2009 CO levels in well 67
22 exceeded the 500 ppm threshold. LFCI
23 believes that spontaneous combustion was
24 initiated near well 67 as a result of
25 elevated temperatures due to the SSO did I

Rough draft

1 read that accurately?
2 A Correct.
3 Q Isn't that the event where you said the
4 event started?
5 A That's where I would say the spontaneous
6 smoldering appeared to started.
7 Q I'm going to stay on 67 and I'm not going
8 to change my preface to my questions.
9 A Okay.
10 Q Let's just talk about well 67. Do you
11 know if during any of the occasions when
12 well 67 was sampled this time frame of
13 interest which I'll refer to as December,
14 2009 now when you said what you said in
15 your report and December of 2010 when the
16 big event was reported, were there any
17 times when well 67 was tested but the well
18 was watered in?
19 A I do not have recollection of noting that.
20 Q You know what it means for a gas
21 extraction well to be watered in had?
22 A Yes, I do.
23 Q And just for those who haven't been down
24 this road, a gas extraction well has pipes
25 down in the waste mass?

Rough draft

- 1 A Correct.
- 2 Q And those pipes have perforations that
3 allow gas to be collected?
- 4 A Yes.
- 5 Q And pulled by vacuum to the well, correct?
- 6 A Yes.
- 7 Q And if the perforations are blocked by
8 water because the water in the waste mass
9 is higher than that at that location, then
10 the net result is that what you test at
11 the wellhead is not gas from the waste
12 mass at all, right?
- 13 A Correct.
- 14 Q What you're testing then because there's
15 nowhere else to get it at atmospheric; is
16 that right?
- 17 A Or gas in the header system.
- 18 Q Okay.
- 19 A If --
- 20 Q So that could dilute it below atmospheric
21 levels if there was already some gas still
22 in the header system or if it could draw
23 some gas out of the header --
- 24 A Yes.
- 25 [indiscernible - simultaneous speaking]

Rough draft

1 Q -- system from other wells?
2 A Yes.
3 Q And you might get a mixture of air plus
4 gas from the header system that would give
5 you a combination of gas components and
6 air components that would be different
7 than pure air or pure gas?
8 A Correct.
9 Q Do you know whether on any of the
10 occasions when MCC tested well GEW 67
11 between December, 2009 and December 2010,
12 whether the perforations in the pipes from
13 the well into the waste mass were simply
14 flooded?
15 A I do not know.
16 Q So you don't know if it was watered in on
17 any of those occasions?
18 A Not that I'm aware of of.
19 Q If it was watered in and the well was
20 nonetheless tested at the wellhead, then
21 what you would expect to see is one of two
22 things: Either you would expect to see
23 atmospheric concentrations of 21 percent
24 oxygen, 79 percent balanced gas or if
25 there's a mixture of the atmospheric with

Rough draft

1 the gas in the header pipes it might be
2 something below that but it wouldn't look
3 like good methane rich gas, right?
4 A Yeah, it depends on what pathways are
5 available, you know, for gas to get into
6 that well.
7 Q Sure.
8 A If it it's totally air tight and no leaks
9 whatsoever then you would expect you would
10 only be pulling essentially whatever
11 residual gas is sitting in that -- in that
12 pipe.
13 Q But there's something else that has to be
14 air tight with no leaks, too, isn't there?
15 Doesn't the /TKR*EUG tube device have to
16 be air tight with no leaks? spelling
17 A If you're testing for carbon monoxide?
18 Q If you're testing for gas characteristics
19 in the well?
20 A Yes.
21 Q Using a /TKR*EUG tube, then if you want to
22 actually test gas, you've got to have a
23 /TKR*EUG tube with no perforations?
24 A Oh, absolutely.
25 Q Because if you have perforations you'll

Rough draft

1 get some false positives for oxygen?
2 A Yes. Diluting in my well, again, this is
3 where I would defer to Dr. Abedini, but
4 typically /TKREG tubes are used
5 exclusively for analysis of carbon
6 monoxide levels and oxygen typically, you
7 know, you rely on the GEM for those
8 readings.
9 Q Okay. So in your instance -- in your
10 example you would find some oxygen in the
11 GEM reading for the well if you have a
12 perforation that allows atmospheric oxygen
13 to enter?
14 A Short circuiting, yes.
15 Q Okay. You would call that
16 short-circuiting?
17 A I would call it will.
18 Q And the reason you're deferring to Dr.
19 Abedini on a lot of questions about gas is
20 that you regard him as being a greater
21 expert than yourself on that subject?
22 A Correct. My practice is fairly limited in
23 landfill gas extraction systems.
24 Q Understood. Now, for Dr. Abedini's
25 experience with landfill gas systems do

Rough draft

1 you know if he has ever been a NSPS
2 compliance officer?
3 A I do not believe so but none 100 percent.
4 Q Do you know how many landfill gas and
5 control systems he has designed from
6 scratch?
7 A I believe certainly while he was working
8 with our company he has been involved
9 with -- I'm trying to think one major one
10 at the mission flats in Kamloops.
11 Q In where, I'm sorry?
12 A Mission Flats in Kamloops and then we've
13 had a number of smaller systems at
14 probably three or four other landfill
15 sites in B.C.
16 Q Can you name any of them?
17 A Yes. Delta Shake and Shingle would be
18 one. Creston landfill would be another.
19 Q How do you spell that?
20 A Creston.
21 Q Thank you.
22 A In old Cranbrook and I'm trying to think
23 if there were other -- that may be it.
24 There may be one or two more.
25 Q which of those are municipal solid waste

Rough draft

1 landfills?

2 A All of them except for Delta shake and
3 shinglele which is a demolition-type
4 facility.

5 Q And landfill are a lot different that the
6 than they are at municipal solid waste
7 landfills?

8 A Somewhat different, yes.

9 Q When the decision was made that your
10 company would obtain its own landfill gas
11 samples at Bridgeton Landfill and not
12 merely rely on the data that had been
13 collected on the landfill over the number
14 of years it was Dr. Abedini that you
15 brought with you and had conducted that
16 activity?

17 A Correct.

18 Q Had he ever actually ever taken gas
19 samples in the field before that?

20 A I believe so, but you should ask him to
21 get clarification.

22 Q Do you know of any particular instance?

23 A In fact I can assure you that in winnipeg
24 we had taken samples and other readings
25 and he has quite routinely taken samples

Rough draft

1 for his Ph.D. research so yes, he has been
2 undertaking gas samples.

3 Q And for how many landfills has Dr. Abedini
4 received the reporting of landfill gas
5 data in order to analyze it and determine
6 if there should be anything done about any
7 of it or a periodic basis?

8 A I'm trying to think. Our company
9 currently monitors the data from the
10 Creston site and the review of the
11 information from Vancouver landfill is
12 predominantly been more focused on his
13 Ph.D.. like that's that was the topic of
14 his doctoral research so he has been
15 interpreting that.

16 Q Sure.

17 A And that would be the to my knowledge the
18 extent of it. There may be others. I
19 again suggest to you that you ask him that
20 question.

21 Q When you read the deposition testimony of
22 David Vasbinder, did you see the number of
23 landfills for which he received monthly
24 gas extraction well data in order to
25 determine whether he needed to take any

Rough draft

1 actions to remain in compliance?
2 A I have a recollection that it was
3 something like 20 or 25 landfills that he
4 was overseeing and reviewing and.
5 Q And that's more landfills than Dr. Abedini
6 has reviewed data from?
7 A I would suspect that he has certainly
8 looked at numerous landfill sites, yes.
9 Q He, who is the he, Mr. Vasbinder?
10 A Mr. Vasbinder.
11 Q But the question was more than Dr.
12 Abedini?
13 A Yes, I would say as to -- I cannot comment
14 on what he actually did in that review in
15 terms of data interpretation.
16 Q And if I recall correctly, you criticized
17 the selection of David Vasbinder to be the
18 environmental manager of the closed
19 Bridgeton landfill between let's say
20 December of 2008 and December of 2010 due
21 to inexperience?
22 A Yes.
23 Q And the only information that you had
24 regarding Mr. Vasbinder's experience was
25 reading his deposition?

Rough draft

1 A Correct.

2 Q And so you knew that in addition to what
3 are number it is, 19, 20, whatever number
4 it is where he would receive the monthly
5 monitoring data and make judgments and
6 obtain advice if needed about what to do
7 about any data, you know -- you knew that
8 when you criticized his experience that he
9 also had just overall landfill monitoring
10 experience for as many as 45 landfills?

11 A I had that impression that he was
12 responsible for looking over all that
13 environmental aspects of a large number of
14 landfills. Specifically I don't recollect
15 whether it was had an or 25.

16 Q And I'm not referring to just his time at
17 Bridgeton Landfill when Bridgeton Landfill
18 was a subsidiary of Republic.

19 A Yes.

20 Q I'm referring to his prior time as an
21 environmental consultant employed by
22 hearst and associates you read that during
23 that time Mr. Vasbinder had actually gone
24 out to landfills and collected
25 environmental samples to obtain data for

Rough draft

1 45 landfills in many that capacity, right?
2 /C spelling

3 A Yes, although my impression at that time
4 was it was more related to water sampling,
5 but I may be wrong with that.

6 Q Certainly some groundwater sampling?

7 A Yes.

8 Q I guess my question for you is this: If
9 you assume that Mr. Vasbinder had some
10 years of experience collecting
11 environmental samples albeit groundwater
12 samples at landfills and then came to
13 Bridgeton Landfill and then that capacity
14 was managing the environmental compliance
15 for 19 and receiving and reviewing the gas
16 data for \$19, that's what you characterize
17 as the inexperience that you criticize?

18 A Yes, and if I may expand on that, I base
19 that comment on sort of what I see an
20 industry in Canada at other landfill sites
21 where, for example, at Vancouver landfill
22 the head technician there, Don Derek lives
23 breathes landfill gas and has massive
24 amounts of experience in education it
25 seems to me at heartland it's our mother

Rough draft

1 major landfill facility /C spelling /C the
2 technicians there, you know, just seem to
3 have decades of experience focused on
4 landfill gas and that's sort of what I was
5 making my comparison to what I was use
6 today in Canada.

7 Q As operating?

8 A As guys operating the gas and monitoring
9 them and analyzing be.

10 Q Those are operating landfills that receive
11 waste?

12 A Correct.

13 Q Those aren't closed landfills?

14 A Correct.

15 Q Do you know of any closed landfills in
16 Canada that have that kind of full-time
17 staffing that you're talking about and all
18 that robust experience on board for
19 landfill gas systems?

20 A No, basically in Canada landfill gas
21 systems extraction systems I think are
22 relatively new certainly in my experiences
23 in British Columbia where back, going back
24 maybe ten years really Vancouver and
25 heartland really were the only two that

Rough draft

1 had gas extraction systems and I'm not.

2 Q In had all of British Columbia?

3 A At that time, correct. In Cache Creek
4 which is another those are the three major
5 landfills we're a fairly small provincial
6 population-wise. So that's what I've been
7 exposed to in comparing technicians that
8 are operating those systems. And in my
9 mind, that it's almost irrelevant whether
10 a landfill is operating or closed. The
11 complexity of the gas extraction system
12 and the, you know, the level to which it's
13 operated needs to have the same level of
14 perseverance and oversight regardless of
15 whether it's open or closed.

16 Q Is there some rule or regulation or permit
17 condition or industry standard to which
18 you are comparing Dave Vasbinder's level
19 of experience in criticizing him as
20 inexperienced?

21 A It was purely a comparison to the levels
22 of experience of the technicians.

23 Q Of landfills in Canada?

24 A Of the landfills in Canada.

25 [Indiscernible - simultaneous speaking]

Rough draft

- 1 Q Are you permitted to practice engineering
2 in any of the states of the United States?
3 A I'm not licensed to, no.
4 Q You're licensed in Canada, right?
5 A I'm licensed in British Columbia.
6 Q Right. But if, for example, you were to
7 consult with a landfill in the United
8 States and make recommendations concerning
9 the landfill gas collection and control
10 system that would result in physical
11 changes to that system that would require
12 permitting, you would have to obtain the
13 services of a local engineer who could
14 seal those plans before they could be
15 reviewed?
16 A Yes, if there was any kind of drawings or
17 things requiring a seal, then I would be
18 looking to either get registered in that
19 jurisdiction or work with a professional
20 who has already done that which is
21 probably easier.
22 Q Do you qualify for registration as a
23 professional engineering in Missouri?
24 A I haven't looked at what the requirements
25 are in terms of a lot of professional

Rough draft

1 engineering things will have overlapping,
2 if you apply them they'll recognize
3 previous credentials but I don't know I
4 haven't explored that in Missouri.

5 Q Do you know whether that's international
6 between Missouri and other countries as
7 opposed to other states?

8 A Again I do not know.

9 Q Okay. If you were to submit a plan
10 drawing for a modifications of Bridgeton
11 Landfill on my client's behalf, the
12 Missouri Department of Natural Resources
13 would reject it and say this has to be
14 sealed by an engineer registered in
15 Missouri?

16 A I would suspect that would be the case.

17 Q I'm speaking with the head of that program
18 on Monday. I'll ask him. He'll know.

19 So let me go back to well 67. I
20 want to be very clear about this one
21 because different people use different
22 values for carbon monoxide as being of
23 importance. Is that a fair statement
24 first?

25 A Yeah, there's generally a range I would

Rough draft

1 say anywhere from 100 to a thousand is
2 sort of there's professional opinions that
3 sort of differ.

4 Q Have you read -- do you know of the United
5 States governmental agency known as FEMA?
6 A Yes, I am aware of it.

7 Q Have you read their document from the
8 early 2000s that contains reference to the
9 use of 1,000 parts per million CO?
10 A Yes, and I had some discussions I think
11 with the authors of that report, in fact.

12 Q Thalhamer?
13 A No, it was -- I recollect it was a lady if
14 it's the same lady I think it was a lady
15 that was involved in writing it and --

16 Q Did you know that Mr. Thalhamer was a
17 contributor to that?
18 A No, I did not.

19 Q Have you seen the report that Todd
20 Thalhamer provided to the Court in this
21 case?
22 A The recent one? Is.
23 Q Yes, sir.
24 A No.
25 Q Did you know that he addressed the

Rough draft

1 question of a what concentration of CO
2 should be regarded as a problem requiring
3 action on the part of a landfill?

4 A No. I -- other than I'm trying to
5 think -- in my report -- I had a copy of
6 an earlier report that Mr. Thalhamer
7 submitted to I believe it was DNR --

8 Q You're talking about his 2013 report?

9 A Correct that I think cited a bunch of best
10 practices I think including CO levels and
11 I believe there's some stuff there on CO
12 levels, but I don't recollect exactly what
13 the numbers were.

14 Q Let me tell you what I'm not talking
15 about. I'm not talking about the table
16 that he prepared that he claims represents
17 excerpts from different companies?

18 A Right.

19 Q And entities standard operating
20 procedures. I'm not talking about that.

21 Are you aware that Mr. Thalhamer,
22 though, in that report advised
23 Missouri DNR what level of carbon monoxide
24 it should look for in being indicative of
25 a potential issue?

Rough draft

1 A I do not recollect. If there was anything
2 in there, it didn't stand out at me.

3 Q And so if I tell you that Mr. Thalhamer
4 advised Missouri Department of Natural
5 Resources in that report in 2013 to use
6 1,000 parts per million of carbon monoxide
7 as being the trigger level for enhanced
8 activity because lower values are simply
9 otherwise indicative of other landfill
10 processes and such, you don't know if
11 that's true or false?

12 A I do not know.

13 Q And if I tell you that Mr. Thalhamer wrote
14 an expert report that was served on the
15 same date as yours in which as opposed to
16 the 500 parts per million that you treat
17 as important or the 1,000 parts per
18 million I just described to you now says
19 that Mr. Thalhamer recommends using 1500
20 parts per million of CO that information
21 is not anything that you've been -- that
22 that you received from the Attorney
23 General's office?

24 A Again I may have received that. I believe
25 I did and I'm not aware of that

Rough draft

1 recommendation.

2 Q Okay. was there ever any time before

3 December 22nd, 2010 when any gas

4 extraction well at Bridgeton Landfill was

5 tested for carbon monoxide and had as much

6 as 1,000500 parts per million?

7 A Off the top of my head I do not recollect

8 that. I would have to, you know, refer to

9 the log in that table. I flagged what I

10 thought the highest levels were and I have

11 a vague recollection there might have been

12 one over a thousand. Maybe there wasn't.

13 Q Time permitting I'm actually going to go

14 through the different appendices with you

15 and ask you the significance of some of

16 your markings that's not evident to me?

17 A Sure.

18 Q And so maybe we'll mark that if we flag

19 it, that would be great.

20 A Yeah.

21 Q Now, let me ask you another question and I

22 just want to be precise about this, are

23 you saying that you do remember even one

24 time when even one gas extraction well at

25 Bridgeton Landfill was tested for carbon

Rough draft

1 monoxide before December, 2010 and was
2 over a thousand even once?

3 A What I would say is I do not -- there's so
4 many numbers that I looked at that I
5 cannot say yes or no.

6 Q Okay. well, let me ask you this: we
7 talked about the instance where a gas well
8 could be off, de-commissioned, closed not
9 working?

10 A Yes.

11 Q And it might be turned on and you wouldn't
12 essentially trust the data until it's had
13 a chance to establish enough flow to make
14 sure you're getting gas in the landfill
15 itself as opposed to to the header pipes,
16 right?

17 A Right.

18 Q And so if you took a CO reading from a
19 landfill gas well that had been closed and
20 you got a certain number and then you
21 allowed the flow to actually actual better
22 over time and then you tested it again and
23 got a lower be in, you would treat the
24 lower number as being the representative
25 number of the content of the landfill gas

Rough draft

1 in the landfill, right?

2 A

3 Q Pardon me?

4 A It would really depend on the case because

5 if you have air intrusion for example you

6 can get massive dilution if you picture a

7 gas well and there's a small area of

8 smolder that's producing gas and you have

9 draw in gas from a very large area you're

10 going to dilute that very small amount of

11 carbon monoxide that's being produced.

12 Q That's if you have air intrusion?

13 A Yeah, and maybe if you don't have air

14 intrusion you're just taking gas from a

15 much larger area and so potentially

16 diluting stuff.

17 Q Isn't it fair that at start-up the longer

18 you've let the well operate, the more

19 representative your sample will be of the

20 conditions that it's monitoring?

21 A Generally, yeah, the broad average gas

22 composition within that entire well annals

23 (phonetic), but in my experience, landfill

24 reactions or fires typically are very

25 localized in nature and sort of the

Rough draft

1 averaging that all the way along we
2 basically dilute an average and so I think
3 you have to be very careful when you
4 interpret data to, you know, determine
5 what's most representative. Spelling
6 Q I understand. You realize I didn't ask
7 you any questions just then about landfill
8 fires or reactions?
9 A Right.
10 Q I was just asking you about testing gas
11 wells.
12 A Yes, and I tried to answer your question
13 as accurately as I could.
14 Q Okay.
15 Now, if you were to encounter a gas
16 well that for your company landfill fire
17 control Inc. were above the standard that
18 you feel is important which is a 500 ppm?
19 A Yes.
20 Q Then you would want to consider whatever
21 actions might be appropriate as a result
22 of that, fair?
23 A Yes, correct.
24 Q I'm trying to ask something so general
25 that it can only have one possible answer

Rough draft

1 and I'll get specific in a moment. But
2 let me just ask you this: Are you aware
3 of any -- and let me differentiate
4 something as a preference. On the other
5 company manuals policies SOP on the other
6 hand I've got government requirements
7 rules, regulations, permit conditions and
8 right now I'm only on government
9 requirements, are you aware of any
10 government requirement that was ever
11 applicable to Bridgeton Landfill which
12 required any action other than continued
13 monitoring if 500 ppm carbon monoxide was
14 detected in a well?

15 A In terms of the actual requirements I'm
16 not now clear of what the action was
17 required if that level was detected.

18 Certainly, in my mind, this should
19 ring some alarm bells.

20 Q I hear you saying that in your mind and in
21 your standards that your company in Canada
22 uses it rings an alarm bell but I'm asking
23 you a very different question than that.

24 what I'm asking you is: There are
25 pieces of paper containing rules, there

Rough draft

1 are regulations, there may be rules that
2 are not regulations, like status. There
3 are permit conditions. There are
4 approvals that have conditions. Are you
5 aware of any of those governmental
6 requirements that required doing anything
7 for a gas well at Bridgeton Landfill if a
8 carbon monoxide test came in higher than
9 500 ppm?

10 A The answer is I do not know.

11 Q That's a perfectly fine answer.

12 A Yes.

13 Q And I understand that you've got other
14 explanations you feel like you want to
15 give, but that's the proper answer to that
16 question.

17 A Yes, thank you.

18 Q Now, is there any carbon monoxide reading
19 at gas well 67, GEW 67 prior to December,
20 2010 that was not promptly reported to
21 both the St. Louis Department of Health --
22 I'm sorry St. Louis department County
23 Department of Health and the Department of
24 Natural Resources?

25 MS. WHIPPLE: Objection. Assumes facts not in

Rough draft

1 evidence.

2 MR. BECK: It assumes no facts. Go ahead.

3 THE WITNESS:

4 A Basically the monthly reports were
5 submitted and so I believe the information
6 was shared.

7 MR. BECK:

8 Q And I may have asked something close to
9 this but I've got to be very precise about
10 it because it's important. In response to
11 any of that reporting, was there ever any
12 action either required or even suggested
13 by either St. Louis County or the state
14 Missouri that was not done by Bridgeton
15 Landfill?

16 A Not that I'm aware of.

17 Q Now, do you know at an operational level
18 back in this December, 2008 to December,
19 2010 time period, do you know at an
20 operational level who was adjusting the
21 flow in the individual gas wells?

22 A My recollection was that there was a team
23 of staff in this monitoring compliance and
24 control that did that and Michael lam
25 certainly was one of the key guys

Rough draft

1 undertaking that task.

2 Q Right. And not that you're comparable as
3 such, but just as Sperling Hansen
4 associates, your company, is an
5 environmental consultant that can provide
6 assistance to landfills, monitoring
7 compliance and control that could provide
8 assistance to landfills?

9 A That's a good analogy, yes.

10 Q Okay. Is there something about the
11 information that Bridgeton Landfill had
12 concerning monitoring Control and
13 Compliance Inc. that in your view you say
14 made it negligent of them to select that
15 consultant to do the gas monitoring work?

16 A No.

17 Q At one point -- no, I'll stop that. I'll
18 ask you a different one.

19 In connection with the collection of
20 data for GEW 67 between December, 2008 and
21 December of 2010, do you know the name of
22 any consultant in addition, not just
23 monitoring control and compliance Inc.,
24 but in addition to them that provided
25 technical assistance to Bridgeton Landfill

Rough draft

1 in respect of the gas data at that well?

2 A Yes, I seem to recollect that there was
3 some thing about Aquaterra.

4 Q what their role was?

5 A But there seemed to be oversight and I
6 actually seem to recollect there was some
7 documentation where Mr. Lam want today do
8 some adjustments and was waiting for
9 approvals from Aquaterra to do so so I'm
10 not sure what the.

11 Q And what you're recollecting was this he
12 wanted to de-commission well 67 but he was
13 waiting for Ottawa approvals one from
14 Aquaterra as the other consultant and the
15 other from St. Louis County Department of
16 Health as the regulatory agency do you
17 recall that now?

18 A I have a vague recollection of that, yes.

19 Q And so was there anything about Bridgeton
20 Landfill's selection and use of Aquaterra
21 as sort of of a redundant or a second
22 environmental consultant to address the
23 same issue, was there anything about their
24 experience or their capabilities that you
25 say made it negligent to hire them?

Rough draft

1 A Not that I'm aware of, no.

2 Q And under the heading two heads are better
3 than one, was it in had some way in your
4 opinion negligent for Bridgeton Landfill
5 to hire and rely on both the consulting
6 firms MCC and Aquaterra for advice about
7 what to do about well 67 is that
8 negligent?

9 A Basically where I feel in my professional
10 opinion that when you have signs of
11 problems, to study, keep studying and
12 studying them month after month. That's
13 where I felt that there was -- somewhere
14 somebody is dropping the ball.

15 Q If there was any truth to what you've said
16 I would give you the point, at least for
17 discussion purposes. Do you know that
18 there is no truth to what you say?

19 MS. WHIPPLE: Objection. Argumentative and
20 assumes facts not in evidence.

21 MR. BECK:

22 Q Do you know that it's not true that they
23 simply monitored and didn't try things to
24 solve the issue?

25 A Basically my information is limited to

Rough draft

1 what I read in the monthly reports.
2 Q And my question is don't you know that if
3 you actually read what's in the monthly
4 reports you would know they did a whole
5 bunch of things beyond just monitor month
6 after month?
7 A From what I've read in the reports that
8 there was essentially the conclusion high
9 CO, continue to monitor and move on. That
10 sort seems to be the --
11 Q And you're not recalling other actions?
12 A Not specifically.
13 Q Let me give you a list of some other
14 actions.
15 A Yes.
16 Q One action might be seek permission to
17 de-commission if it requires regulatory
18 permission you can't do it until you get
19 permission seek permission to
20 de-commission that's one action.
21 The second is de-commission once you
22 get permission to do that.
23 The third is re-drill the well. The
24 fourth is check the next well, the closest
25 well to it and see if that's got some CO

Rough draft

1 even though it's not required to be
2 monitored for CO just voluntarily step in
3 and do no those are all actions other than
4 just monitoring, right?

5 A Yes, and I do recollect some of those
6 actions being taken.

7 Q And do you know what happened when they
8 tested the next well the one next to the
9 GEW 67 do you know if in testing the next
10 well they found any CO there?

11 A I have recollections that there were other
12 wells that had, you know, levels of CO
13 that were elevated I believe up to 350
14 ppm. I would have to look at exactly
15 where they were, but.

16 Q Let me help you sort these out. The wells
17 you're talking about are in in the wells
18 that were in the high operating value
19 letter of St. Louis County that had to be
20 tested and those were the ones that were
21 that had to be under 500 ppm?

22 A Yes.

23 Q What I'm talking about nobody is making
24 them do anything nobody has even suggested
25 they do anything but they voluntarily with

Rough draft

1 their consultants advise, go out to the
2 next well closest to 67 and test it even
3 though it's not part of the protocol to
4 see what it shows and they find nothing.
5 That's an action, right?

6 A Yes.

7 Q That's not sitting on your hands?

8 A Although, if I'm sort of recollecting the
9 information that by the time December 2010
10 rolled around, there were something like
11 15, you know, highly elevated wells by
12 then with very high temperatures and I
13 would anticipate some elevated CO levels
14 as well, but I would have to again look at
15 the data now. I can't recollect.

16 Q You think there were only 15 then?

17 A That's my recollection and from the
18 documentation.

19 Q weren't there 28?

20 A I seem to remember in reading the
21 information that there were 15, but I may
22 be wrong.

23 Q well, and you say that you would expect
24 then to see some CO in those wells, right?
25 Didn't they test all 28 wells?

Rough draft

1 A I --
2 Q Immediately in December of 2010 didn't
3 they immediately test all 15 wells and get
4 lab data back for the CO?
5 A I cannot remember now what if P that was
6 done at that time.
7 Q Didn't every single well of the 28 have
8 more than 1500 ppm of CO when lab tested
9 in December of 2010 when they identified
10 this problem?
11 A I would expect that would be the case, but
12 I.
13 Q But you haven't seen it? You haven't seen
14 that information?
15 A I'm trying to recollect because I know
16 that over time, you know, there have been
17 superhigh carbon monoxide levels and I
18 just don't remember.
19 Q Later on?
20 A The timing of when these CO high readings
21 were actually detected.
22 Q Let me give you the name of the lab and
23 see if that spurs any memory. The lab
24 that did the wells 28 in December of 2010
25 was called Microbe inner tech. Do you

Rough draft

1 remember seeing their results?

2 A No.

3 Q Had you ever heard that name before I said
4 it?

5 A No, I don't remember that I did.

6 Q Microbe?

7 Q would it have been helpful for you to have
8 a complete history of all carbon monoxide
9 detections prior to December of 2010 at
10 any gas extraction well at Bridgeton
11 Landfill?

12 A Absolutely.

13 Q All in one place where you could see them?

14 A Yes, and especially plotted in a map,
15 hugely helpful.

16 Q well, I'm not going to tell you they were
17 plotted in a map, but I will tell you they
18 were all deposition exhibits to the
19 deposition of Jared Romaine that nobody
20 gave you.

21 would it have been important to you
22 to see a deposition that discusses these
23 monthly reports and what they mean and
24 with that the deposition exhibits which
25 contained all the of the CO data in order

Rough draft

1 to provide your best opinions?

2 A I would say that in any instance
3 additional data is always beneficial.
4 whether or not it would lead me to a
5 different conclusions, I would have to
6 wait to see what that information
7 provides.

8 Q Okay. Now, you went out with Dr. Abedini
9 and on July 22nd, 2010 he and Mr. Lam
10 together, Mr. Lam now works for the
11 landfill?

12 A Yes.

13 Q He and Mr. Lam together saw to it that Dr.
14 Abedini ended up with landfill gas test
15 opportunities at ten wells?

16 A Correct.

17 Q How were -- how was the number of wells
18 to test established how /(?

19 A Basically at the onset we felt that we
20 could sample about one well an hour and so
21 we knew we had one day to do the sampling
22 so we felt, you know, like roughly ten
23 wells or something was our target.

24 Q Fair enough.

25 A And prior to getting on site Brenda Audrey

Rough draft

1 (phonetic) she provided us a number of
2 wells that were unsafe to go one and she
3 provided us with the list of the number of
4 wells that could be tested and so based on
5 that we kind of looked at the lay of the
6 land and where we thought the reaction was
7 most active and sort of tried to select a
8 number of wells to investigate those areas
9 and some focus in the neck area as well
10 and a couple wells in the North Quarry
11 area and we basically formed a testing
12 plan of these ten wells.

13 Q Okay.

14 A And when we got on site we unfortunately
15 discovered that when we tried to access
16 some of these wells that they also were
17 flagged as, you know, basically unsafe or
18 not so we had to adjust our sampling
19 strategy to find other wells nearby.

20 Q All ten?

21 A No. No, I can't remember the exact
22 number, but I do remember.

23 Q Two?

24 A When we first started we choose one well
25 oh, it's flagged can't sample went to the

Rough draft

1 next one oh, can't. Oh God what's going
2 on?

3 Q How many wells fell in that category out
4 of the ten you picked?

5 A Oh, I don't have the exact number. I
6 would say it's something like four or five
7 maybe.

8 Q Okay: But you ended up picking ten wells
9 that gave you representation of the
10 general areas you were trying to sample to
11 get information from the landfill?

12 A In general I felt that we were able to get
13 good, good samples, yeah.

14 Q And with respect to each of the ten, you
15 developed essentially three sets of values
16 xx different parameters. One was your own
17 field set from Dr. Abedini. The second is
18 Bridgeton Landfill's field set and there
19 was your own lab set for the things you
20 sent to a laboratory?

21 A Correct and there was a fourth one that
22 we're not sure that I believe that
23 Bridgeton also pulled from us and told I'm
24 curious to see if they're comparable.

25 Q Okay. So you're saying that when Dr.

Rough draft

1 Abedini took a SUMMA canister sample at a
2 particular gas well, that Bridgeton
3 Landfill also, in order to have
4 essentially a split, took its own SUMMA
5 (phonetic) canister sample also?
6 A Correct.
7 Q And nobody showed you those?
8 A No.
9 Q And you thought there was decent agreement
10 between your field data, Bridgeton's field
11 data and the lab samples and you would
12 SUMMA samples from Bridgeton to see if
13 that all agrees?
14 A Correct.
15 Q Got it. Are there any significant areas
16 of the landfill which you were unable to
17 test that you wanted to test after making
18 adjustments from well A to well B?
19 A I think overall we got reasonable
20 representation. There was one or two
21 wells that I felt were right in the heart
22 although I can't remember the numbers
23 right now, but yeah, I feel in general
24 that we got good enough data, so I'm not
25 too worried about it.

Rough draft

1 Q Okay: Now, every well that you tested had
2 been tested periodically for a long time,
3 right?

4 A Yes.

5 Q And except for the CO data which are not
6 part of the regular regime, all of the
7 data for things like methane, carbon
8 dioxide, oxygen pressure, temperature, all
9 of those things are in that spread sheet
10 you got that came from SCS?

11 A Yes.

12 Q And did you base the conclusions in your
13 report then -- that's a bad question. I'm
14 going to start that one over.

15 And so with respect to the
16 conclusions in your report that relate to
17 particular wells that you sampled and the
18 particular results that you got at the
19 wells that you sampled, you and Dr.
20 Abedini, before writing up your opinions
21 about those wells did you go back and
22 compare your values for everything to what
23 had been in the SCS database?

24 A In general, with the CO levels in had
25 particular I did some comparative looks at

Rough draft

1 that information.

2 Q I'm going to focus in on one well from
3 that sampling effort also. Actually two
4 but one right now which is GEW 109.

5 A M'hmm.

6 Q It's a well in the South Quarry --

7 A Yes.

8 Q Near the neck. For GEW 109 did you ever
9 look at the historical CO data for the
10 sampling of that well after the December,
11 2010 up to the time when you sampled?

12 A Yes.

13 Q So you were able to compare the value that
14 you got for CO to the values that have
15 been historically detected there?

16 A Yes, in my recollection, yes.

17 Q And I'm going to ask you a question for
18 the second well which is also in the South
19 Quarry near the neck but actually a little
20 north of 109 and that's GEW 39.

21 A Okay.

22 Q GEW 39 was according to your sheet not
23 impacted. Were you able to look at the
24 historical CO sampling data for GEW 39
25 before you wrote your report or did you

Rough draft

1 rely solely on your own data?

2 A I on that one I did not I do not have a
3 recollection of comparing historical to
4 what we read there /(.

5 Q Now, is it important -- well, one of the
6 topics that you address in your report is
7 the topic of movement and, in particular,
8 in respect to the subsurface reaction
9 exothermic reaction at Bridgeton the
10 movement of reaction?

11 A Yes.

12 Q Could you describe in your own words what
13 you mean by movement of reaction in P that
14 context?

15 A Yes, so in my mind I reviewed all the
16 chemical data that was collected by
17 Bridgeton and sort of recognized that
18 there seemed to be a repeating pattern in
19 in the -- in had change in the chemical
20 conditions in all the wells and, in had
21 particular, I sort of identified, you
22 know, what I called five sort of different
23 or unique reaction phases. And the Q 1
24 being the transition from level or stage 3
25 at some stage 4 where I believe it's

Rough draft

1 really the onset of the pyrolysis reaction
2 in each section of this SSSER. To me that
3 was the key element time point where
4 things really start producing all the
5 hydrogen gas etc. and so I I looked at
6 when that critical period occurred at each
7 of the wells and based my movement
8 analysis on that.

9 Q Okay. And are you saying you did that
10 with respect to the ten wells you sampled
11 or did you do that with respect to all the
12 wells at the landfill?

13 A I did that with all of the wells at the
14 landfill because it's a very, you know, a
15 long-term kind of analysis. You can't do
16 it from one sample.

17 Q M'hmm?

18 A It's looking at how things change.

19 Q So we're in agreement on that. You can't
20 take one sample and call it movement
21 because there have to be two different
22 samples at two different?

23 A Yeah, prefer to be much more than that.

24 Q Sure. But a single sample alone doesn't
25 give you movement?

Rough draft

- 1 A No.
- 2 Q It gives you a snapshot that is still?
- 3 A Yes /C /C noise.
- 4 Q Now, you brought up something that I was
5 going to get to, but I probably ought to
6 jut put away one curiosity that I have
7 about it right now and that is in
8 describing the events at Bridgeton
9 Landfill historically in your expert
10 report, you divided the condition of the
11 the conditions at the landfill that you
12 talk about in your report into five
13 stages?
- 14 A Yes.
- 15 Q And those five stages, some of them are
16 described by chemical reactions that were
17 provided to you mostly by Dr. Grace but
18 also to some degree by Mr. Foss-Smith?
- 19 A Correct.
- 20 Q And the information you provide concerning
21 those reactions is based on their advice
22 given to you in the appendices in the
23 report in the appendices compared to your
24 own independent opinion and research?
- 25 A Predominantly my interpretation /C was

Rough draft

1 really looking at the break points in the
2 graphs as to what's actually causing them.
3 I'm quite, you know, I feel I'm way
4 outside my level of expertise, but to
5 actually recognize the break points and
6 the times the temperature increases,
7 that's what I was marking and that was
8 done independently as to what might be
9 going on I relied on the experts to try
10 and explain that.

11 Q So they gave you information utilized
12 labels and applied them to different
13 stages certain stages?

14 A Yeah, it's more in terms of looking at the
15 types of chemical reactions and, you know,
16 like whether carbon monoxide is going up
17 or down or hydrogen going up or down in
18 relation to the reactions that I was
19 providing with.

20 Q Sure.

21 A The first one with the watering reaction
22 which I nailed down on the winnipeg thing
23 one possible thing that I still think is a
24 significant contributor.

25 Q Did you ever come to a conclusion that you

Rough draft

1 reported to anyone in winnipeg there was a
2 water-gas shift reaction?

3 A Yes, actually I reported to them something
4 like a year ago something was generating
5 these high hydrogen levels which were very
6 unusual and I at that time did a bunch of
7 research and came across this water-gas
8 shift reaction as a possible contributor
9 and since then I've learned there may be a
10 range of other reactions, as indicated in
11 Dr. Grace's --

12 Q And did you describe the water-gas shift
13 reaction in writing to the winnipeg
14 operators a year ago?

15 A Yes, I would have given them a report and
16 that's described in that report.

17 Q what's that report called?

18 A O boy. Assessment the of -- I can't
19 recollect exactly what it's called.

20 Q Describe it for me in a way that if you
21 get a from Ms. Whipple to provide it to
22 her would enable you to find it.

23 A Yes. It would be landfill fire report on
24 field monitoring of Brady (phonetic)
25 landfill spelling /C and it would have

Rough draft

1 been co-authored with Dr. Abedini again we
2 did it.

3 Q Dr. Abedini?

4 A Yes.

5 Q But not Dr. Grace and not Mr. Foss-Smith?

6 A No, no, at that time I didn't undertake
7 any additional research. I was not aware
8 that those guys existed.

9 Q And this is about a year ago?

10 A It would have been -- my recollection is
11 in 2014, 2013, 2014.

12 Q That landfill is publicly owned or
13 operated?

14 A Yes, by the city of Winnipeg.

15 Q In Missouri if it we want to see a
16 government record we send what's called a
17 sunshine request to them. Is there a
18 method by which odor people can get their
19 hands on copies of government records in
20 had Canada?

21 A I believe and I'm not sure if this is a
22 provincial statute or a federal one.
23 There's like a Freedom of Information Act
24 where people can, you know, ask for
25 government information.

Rough draft

1 Q Was there any follow-up on that report to
2 the city of winnipeg that you were
3 involved in or where they took action
4 based on your report?

5 A They did continue to monitor and have
6 continued to do so and as a result of what
7 I'm learning through this this process, I
8 also contacted them to say, you know, you
9 guys I've come across this subsurface
10 reaction self-sustaining reaction and, you
11 know, I believe we better start really
12 looking into that and they've gone to
13 they've higher management to see if there
14 would be some funding to allow us to sort
15 of investigate this because I'm very
16 concerned about that site.

17 Q And that was in the nature of offering
18 your continued services or renewed
19 services?

20 A Yes and no. It's also about a tremendous
21 concern about same sort of problem
22 developing in winnipeg which I'm hoping if
23 we can get on quickly that we can turn,
24 you know, stop it before it becomes a big
25 problem.

Rough draft

1 Q But one thing that would be useful to me
2 in reviewing that report it would give me
3 a snapshot about chemical reactions like
4 this that you and Dr. Abedini had before
5 you got to Dr. Grace and Mr. Foss-Smith?

6 A Yes.

7 Q If you were hired by the city of Winnipeg
8 in response to your inquiry to help them
9 manage their situation so that it doesn't
10 get worse, would you probably choose to
11 involve someone like Dr. Grace in order to
12 have the expertise required to deal with
13 that reaction?

14 A Absolutely.

15 Q So let's talk about gas extraction well
16 109. At gas extraction well 109 when you
17 and Dr. Abedini went to Bridgeton Landfill
18 and he collected samples, both your
19 field and laboratory samples of GEW 109
20 showed carbon monoxide in excess of 500
21 parts per million?

22 A Correct.

23 Q And because it was in 5 in excess of 500
24 parts per million you said to yourself,
25 this is impacted and then you looked at

Rough draft

1 the value itself to see whether you
2 thought it was moderately or severely
3 impacted?
4 A Correct. Le I'm just again trying to find
5 that table.
6 Q It's page 99. .
7 A Thanks so much for reminding me. Right.
8 Q Is that what you needed?
9 A Yes, I appreciate it. I'm just wanting to
10 refresh my memory in terms of CO level
11 there. I'm reading it at 1900 if P I'm
12 not mistaken.
13 Q I think Ms. Cunningham actually we
14 produced this in a larger size that we can
15 all read it better. So why don't we see
16 and why don't we mark it Ms. Ms. It's not
17 much larger?
18 MR. BECK: It's better. It's just perfect for
19 readers: see if Exhibit 2 is the same
20 thing in a size that's a bit easier to
21 read.
22 A Yes, that makes it a lot easier, thank
23 you.
24 MR. BECK:
25 Q All right. So this is a useful tool.

Rough draft

1 Let's stay here a while. So GEW 109 is
2 the last row of data in the table or chunk
3 of data in the table etc. that's got four
4 rows I suppose?
5 A Yes.
6 Q And the last value for CO in this row was
7 1900 ppm parts per million?
8 A Correct.
9 Q And that's why you categorized it as
10 moderately impacted by the reaction?
11 A Correct.
12 Q Now, you see how this says SSE as the
13 descriptor all over this table?
14 A Yes.
15 Q Your corrected version of that now would
16 be SSSER?
17 A SSSER, yes.
18 Q So any place I see SSE should I just in my
19 mind --
20 A Please.
21 Q Substitute SSSER?
22 A That would be appropriate.
23 Q I shall.
24 The field data however, for carbon
25 monoxide don't show any values for well

Rough draft

1 GEW 109 in that sampling event. Is that
2 because neither Dr. Abedini nor Bridgeton
3 Landfill collected field data for CO or is
4 it because they were non-detect?

5 A It's because that was the last well we
6 were testing and we were running out of
7 time and I'm not sure if we were also
8 running out of Gastec tube I can't
9 remember now, but it was a big time
10 constraint on getting done before dark and
11 having everybody off site and I can't
12 remember the exact details, but there was
13 a reason why those samples were not drawn.

14 Q Okay. And in the very last row of that
15 table for the lab analysis it shows that
16 it was done two days later on July 24th
17 and there's a time stamp of 9:23. Am what
18 does that mean, the time stamp?

19 A Can you point me to just --

20 Q Sure it's this column right here that says
21 time and it's got the time at 9:23 on the
22 24th and I just didn't know what to make
23 of it.

24 A Yes, I believe that is essentially when
25 the sample was taken, but that would be a

Rough draft

- 1 Dr. Abedini question. He sort of
2 tabulated this table and.
- 3 Q Okay. Now, just looking at three of the
4 values for the GEW 109 sample that you and
5 Dr. Abedini took on July 22nd, 2015 three
6 of the values are carbon monoxide at 1900
7 ppm, hydrogen at 32 percent and
8 temperature at 175.2 degrees Fahrenheit,
9 correct?
- 10 A Correct.
- 11 Q And when you described well GEW 109 as
12 moderately impacted, you were taking
13 account of all three of those values as
14 well as any others you had?
- 15 A Correct.
- 16 Q And did you find in comparing the GEW 109
17 data that you collected on July 22nd, 2015
18 to the whole history of data at that well
19 that it was approximately the same as or
20 different from what had been seen before?
- 21 A My recollection of going back that there
22 was elevated CO readings at that well
23 previously as well.
- 24 Q So it wasn't any news that GEW 109 had
25 reaction impacts? That's something that

Rough draft

1 had been known for a long time.

2 A what was of concern to me is that I was
3 under the impression now maybe it's
4 incorrect I was told that that the SSSER
5 had not moved past the GIW wells.

6 Q Now you've hit it. Who told you that?

7 A That I cannot recollect where -- where
8 that information came from.

9 Q Let me give you three candidates and the
10 fourth can be named later.

11 A Yeah.

12 Q The first Canadian data is one of these
13 lawyers in the Attorney General's office
14 sitting across from me. The second is
15 Brenda /A*UB from the Missouri Natural
16 Resources, the third is Dr. Abedini and
17 the fourth is someone else. Can you
18 identify among those four which it is?

19 A I would say one other may be Todd
20 Thalhamer in -- I do not have a
21 recollection as to where that information
22 came from. That was just a something in
23 my mind that as I became involved in this
24 project, you know, it seemed to me like
25 the concern about the SSSER spreading into

Rough draft

1 North Quarry is very critical, very
2 important issue and that the line of GIW
3 was sort of the primary line of defence
4 to, you know, limit that spread and maybe
5 it was even an inference based on that
6 that, you know, that from the reports that
7 I was reading that this was the critical
8 line of defence and if the reaction had
9 gone beyond that we would be with in big
10 trouble.

11 Q You got this information maybe from
12 Thalhamer, maybe not that the reaction
13 stops at the GIWs and then you collect
14 your field data and you see, no, here's
15 evidence of effects of the reaction at a
16 minimum at well GEW 109 which is tense of
17 feet north of the the north line of GIWs
18 and that was surprising to you because it
19 was different than what you had been told?

20 A What I was expecting, yes.

21 Q And that was because what you were
22 expecting was that the historical
23 performance of the gas interceptor wells,
24 the GIWs was so complete that nothing got
25 past passed them?

Rough draft

1 A Basically I would say the way I
2 interpreted it was that Bridgeton and
3 Republic were from the reports I read, you
4 know, that both GIWs were the de-facto
5 line of defence to prevent the SSSERS
6 going into the North Quarry and if -- if
7 the reaction had passed beyond that line
8 of defence, it was a significant concern.

9 Q To you?

10 A Yes.

11 Q One well if it just one well pass it was a
12 significant concern to you?

13 A Absolutely.

14 Q Okay, good. And that, again, that concern
15 initially started because, A, you saw the
16 question of protecting the North Quarry as
17 being paramount primarily because of the
18 rad material beyond the north part and B,
19 let me get my question out and then you
20 can correct it and B because you had the
21 understanding from Thalhamer or someone
22 that you should expect no impacts passed
23 the gas intercept wells?

24 MS. WHIPPLE: Objection form compound.

25 MR. BECK: Go ahead.

Rough draft

1 THE WITNESS:

2 A So I see two big issues with movement of
3 the reaction into the North Quarry. One
4 being the impact on the community such as
5 was experienced in the South Quarry and
6 the other being approximately at the
7 radiological waste and so those two things
8 I think are of equal concern. I don't
9 know which is of greater concern.

10 Q So that first part has two provincial and
11 you've given them both?

12 A Right, and then in the second can you
13 refresh my mind?

14 Q Yeah, and the second is that it was
15 surprising to you to see reaction impacts
16 beyond the gas interceptor wells because
17 you understood that you had been told
18 perhaps by Mr. Thalhamer that there were
19 no impacts beyond the GIWs?

20 MS. WHIPPLE: Objection. Assumes facts not in
21 evidence.

22 THE WITNESS:

23 A Correct, yeah, I was anticipating that the
24 reaction would be contained by the GIWs.
25 That was an expectation that I had. As to

Rough draft

1 where I formed that expectation I honestly
2 cannot say where it came from.

3 MR. BECK: I hear you and I know you've given us
4 the best answer that you can. But let me
5 just ask for three events in sequence and
6 see how they fit. The first event is
7 somebody, that may be Mr. Thalhamer tells
8 you the reaction stops at the GIW GIWs you
9 shouldn't expect reaction beyond the GIWs.
10 The second is you collect your lab data
11 that are inconsistent with that and then
12 there are two more one is you write your
13 report and one is you look at the
14 historical data for GIW GEW 109 of those
15 which occurred first.

16 MS. WHIPPLE: Objection assumes facts in
17 evidence.

18 THE WITNESS:

19 A There's too many things.
20 [Indiscernible - simultaneous speaking]
21 I'm

22 MR. BECK:

23 Q Let me make it you've told us that you
24 wrote your report after you collected
25 those data?

Rough draft

1 A Yes.

2 Q You also told me that you looked at the
3 historical data for GEW 109?

4 A Yes.

5 Q Did you do that before or after you?

6 A I looked at the data before I wrote my
7 report.

8 Q Okay. So you knew that the data you
9 collected at GEW 109 were consistent with
10 the prior data before you wrote your
11 report?

12 A Basically in terms of looking at the prior
13 data, I believe it's something that Dr.
14 Abedini flagged for me subsequent to the
15 time I wrote my report.

16 Q And that's what I was trying to note that.
17 why don't we take our lunch break and
18 we'll pick up where we left off?

19 THE WITNESS: Sure.

20 THE VIDEOGRAPHER: Going off record. This is the
21 end of media Unit Number 2. The time is
22 12:28 p.m.
23 (PROCEEDINGS RECESSED AT P.M.)
24 (PROCEEDINGS RESUMED AT P.M.) is
25 THE VIDEOGRAPHER: We're back on the record. Here

Rough draft

1 begins media Unit Number 3 in the
2 deposition of Tony Sperling. The time is
3 1:18.

4 MR. BECK:

5 Q Dr. Sperling, after the lunch break are
6 you ready to proceed?

7 A Yes, sir, refreshed.

8 Q Speaking of refreshing, let me refresh my
9 own memory by asking if it the Court
10 reporter can tell me what the last
11 question and answer were. Question?

12 THE COURT REPORTER: (By reading):

13

14 MR. BECK:

15 Q Do you remember where we left off now?

16 A Yes, sir.

17 Q Thank you.

18 So at the time you wrote your report
19 you hadn't compared the GEW 109 data from
20 your July 22nd sampling event to prior
21 data.

22 A No.

23 Q You learned it later?

24 A I looked at all the wells in the context
25 of the historical I looked at the graphs I

Rough draft

1 produced and they're all in appendices and
2 so I was looking at the long-term trends
3 in that regard and then I went looking at
4 the assessment of the cull field readings
5 that we did, I was focused on that one
6 table and comparatively looking at the
7 individual wells, but at the time of the
8 report I did not cross correlate what we
9 were that what we were seeing with the
10 historical.

11 Q And by that one table you're referring to
12 the --

13 A Correct.

14 Q The one marked as Exhibit 2?

15 A Yes.

16 Q

17 [Indiscernible - simultaneous speaking]

18 Q How much later than your report was it
19 that Dr. Abedini called your attention to
20 the prior CO data GEW 109?

21 A It was fairly recently. I'm trying to
22 think, probably in the last week, last few
23 days.

24 Q Okay. So sort of in preparation --

25 A Yes.

Rough draft

1 Q For your deposition?
2 A Yeah, we were reviewing stuff and just
3 going through everything.
4 Q Did Dr. Abedini review the report that you
5 submitted before you submitted it?
6 A Yes.
7 Q So he knew what it contained?
8 A Yes.
9 Q And how did it come about that recently he
10 shared with you sort of the GEW 109 CO
11 monitoring history?
12 A I think you better ask him exactly that
13 question. I'm trying to recollect it was
14 during our discussions with Peggy Whipple
15 and we were just talking about well 109 at
16 some point and you just mentioned by the
17 way that that well had elevated COs going
18 back in this time I don't know. That's
19 and I looked back and certainly, you know,
20 I have no arguments with that conclusion.
21 Q And was this earlier this week you had
22 that conversation?
23 A Yes.
24 Q Was it within the last 48 hours?
25 A Well, it would have been -- I'm trying to

Rough draft

1 think. what day is today. wednesday?
2 Ish.
3 Q It is.
4 A Yes, so most likely Monday.
5 Q Okay. So, Dr. Abedini knew you were
6 preparing for your deposition and you were
7 meeting with him and the lawyers from the
8 Attorney General's office?
9 A Correct.
10 Q The topic of GEW 109 data came up and
11 during that conversation Dr. Abedini
12 pointed out to you and called your
13 attention essentially that the well had
14 previously had CO detections?
15 A Yes.
16 Q And that was when you learned it was when
17 he told you?
18 A I sort of was curious at the time what the
19 significance of that particular thing was
20 and I was somewhat concerned about it
21 because I feel, you know, that it -- that
22 the presence of that hot well beyond GIW
23 or beyond the rules of GIW wells is to me,
24 you know, a concerning thing and it's
25 something I did not pick up on during my

Rough draft

1 global review of the data as to exactly
2 where the reaction was.

3 Q Understood and what you're saying is when
4 you wrote the report, it was concerning
5 what you found in July in this week as you
6 were preparing for deposition it was still
7 concerning to you, but in an issue to
8 having that concern you required the
9 additional information that the well had
10 had shown similar degrees of impact for a
11 long time?

12 A Correct.

13 Q And so the wells still concerned you, but
14 it doesn't demonstrate recent movement of
15 anything?

16 A I would not draw that conclusion. All it
17 indicates is that the reaction, you know,
18 has come and gone to well 109 and as to
19 how much further it's migrated beyond that
20 point I would have to look at additional
21 data from the other wells.

22 Q But you have?

23 A I have, but on the microscale within the
24 bridge within the neck.

25 Q And within the microscale of just the

Rough draft

1 bridge in the neck, you did test another
2 well just beyond GEW 109 --
3 [Indiscernible - simultaneous speaking]
4
5 A Yeah.
6 Q -- to the north even if you're agreeing
7 which makes you right so when you said you
8 did, you agreed you did look at additional
9 wells in the same micro area of the neck,
10 you're speaking specifically of GEW 39?
11 A Correct.
12 Q GEW 39 is slightly further north than GEW
13 109 the well you focused on in your
14 report?
15 A Yes.
16 Q And when you took your sample data from
17 GEW 39 on July 22nd, 2015 and looked at
18 the results of that sampling, the judgment
19 you made was that GEW 39 was not impacted?
20 A Yes, wet that the data suggests that it
21 still seems to be unimpacted.
22 Q Okay. And so your concern at the time you
23 wrote your report was that if GEW 109 is
24 partway toward the North Quarry and GEW 39
25 is a little farther toward the North

Rough draft

1 Quarry, that there's a possibility that if
2 the reaction has gotten as far as 10 \$9 it
3 may get as far as 39 in the future?

4 A Correct.

5 Q And may go even further?

6 A Yes.

7 Q And what you didn't know when you wrote
8 the report but you do know now is that
9 historically not only has GEW 109 shown
10 impacts for a long time, but GEW 39 has
11 been unimpacted for a long time and, in
12 fact, has improved over time, right?

13 A Yes. About the improved over time, that I
14 haven't looked at to be able to draw that
15 conclusion.

16 Q Fair enough. Improved over time by that I
17 would mean and let's see if it we're
18 talking about the same results, lower
19 numbers are good here, right?

20 A For most things, yes.

21 Q For CO in these wells at that neck?

22 A Yes, correct.

23 Q And so if GEW 39 used to be higher than it
24 is now and has gone down and you're seeing
25 it as not impacted, that reduction is is a

Rough draft

1 good thing, right?
2 A I wouldn't draw that conclusion given what
3 I see it in the neck.
4 Q Okay. Because you're still concerned
5 about 109?
6 A No, I'm just in general my perception is
7 that there's a very massive overextraction
8 of the landfill gas from that area to try
9 and contain the reaction products and
10 general inclusion of atmospheric air into
11 a lot of the wells which is diluting a lot
12 of the readings.
13 Q Let me ask you agree that that is
14 literally impossible as a matter of the
15 laws of physics. Will you agree with that
16 that what you just said is literally
17 impossible as a matter of physics?
18 A I would have to understand your reasoning
19 by that. I don't see that crystal clear.
20 Q So where are you talking about the
21 aggressive overdrawing occurring that
22 draws in this atmosphere air?
23 A So basically I'm looking at the big
24 picture analysis that we did and what we
25 are seeing over time and that's presented

Rough draft

1 in a number of the graphs, you know, that
2 we generated of the gas composition and
3 especially where we're basically seeing
4 the landfill going from an anaerobic
5 through an aerobic into the SSSER and now
6 into atmospheric conditions and I also see
7 that on a well by well basis whereas the
8 wells move into the Stage 5 position that
9 don't see balanced gas and air incursion
10 and an elevated levels of balanced gass.

11 Q For the record I'm going to strike as
12 non-responsive.

13 So let me ask you this: In the neck
14 are you saying that GEW 109 is being
15 overpulled?

16 A I would have to look at the data itself.
17 What I'm.

18 Q Go ahead.

19 A Okay. Actually, what I would need for
20 that and I'm not sure if I have it here,
21 is the data set of in my appendices.

22 Q Which appendices?

23 A It would be the one that shows the
24 chemical compositions of the of the
25 numerous wells with all the colored

Rough draft

1 interpretations.

2 Q Sure. Can you tell me just from the index

3 which appendix to give you?

4 A I possibly can. Let me see if particular

5 figure it out.

6 A It looks like I can unfortunately cannot.

7 Q One second, please.

8 while we're looking for appendices

9 let me just ask you a simple question.

10 A Sure.

11 Q When you went to the landfill you found

12 something that did not surprise you

13 because you already knew it would be there

14 and that is a synthetic cover over the

15 South Quarry, right?

16 A Correct.

17 Q Is that synthetic cover has what are

18 called boots which are devices that go

19 around the pipe of a gas extraction well

20 so that it can slide up or down if

21 settlement occurs without losing the

22 integrity of the seal?

23 A Yes.

24 Q And the entire South Quarry is covered by

25 this EVOH material?

Rough draft

- 1 A Yes.
- 2 Q EVOH stands for ethylene vinyl alcohol and
3 it's unusual as a landfill cover, correct?
- 4 A It has some unique or beneficial
5 properties of limiting gas permeability if
6 that's what you're wondering about.
- 7 Q In fact, one of the uses of EVOH is as a
8 barrier for vapor intrusion of volatile
9 organic chemicals because it's simply so
10 tightly constructed that they cannot pass
11 through it the way they might pass through
12 HTPE (phonetic), right? Spelling
- 13 A Yes.
- 14 Q It also is utilized in some instances as
15 a radon barrier because it is capable of
16 containing radon molecules?
- 17 A Yes.
- 18 Q You know in this application the beauty of
19 EVOH cover at Bridgeton Landfill is that
20 it has the capability to contain small
21 sulphur molecules that are known to cause
22 significant odor and, therefore, it has
23 the benefit of being helpful in preventing
24 odor from escaping out of the South Quarry
25 into the ambient air of the neighbourhood,

Rough draft

1 right?

2 A Yes.

3 Q Have you looked up information about just
4 how impermeable this is?

5 A I have to some degree.

6 Q And is the EVOH version that is
7 manufactured by Raven Industries and was
8 placed at the site?

9 A I believe that's the material that was
10 placed, yes.

11 Q And do you remember that the name of the
12 material everybody gets to name their own
13 products the name of the material was the
14 Ultimate Barrier?

15 A If that's what they claim, I have some
16 serious reservations with that.

17 Q You can express those in a sec, but you
18 don't know if that's their name for it or
19 not?

20 A Yes.

21 Q If it with me I would call it the
22 penultimate barrier, but have you observed
23 the way that material is constructed?

24 A Yes.

25 Q You know that it is a series of sandwiched

Rough draft

1 layers of plastics and resins the end
2 result of which is a lot of containment
3 ability?

4 A Yes.

5 Q And you have some concerns about it as
6 those with respect to its melting point
7 and the possibility of tearing it?

8 A The number of defects and holes that I
9 observed on the site some of which were
10 fairly significant and created I believe
11 pathways that short-circuited the
12 material.

13 Q And how big was the bigettes defect that
14 you took a picture of?

15 A Probably about 2 feet in width.

16 Q 2 feet in width?

17 A Yes.

18 Q It was a tear /(?

19 A It was a perimeter culvert.

20 Q So it was a weld that had come undone?

21 A It seemed like a weld of the boot was my
22 impression.

23 Q Okay, and so it needed repair?

24 A Absolutely.

25 Q And relative to the radius of influence of

Rough draft

1 a particular single gas extraction well
2 and the amount of gas the gas extraction
3 well can touch based on its radius of
4 influence, the amount of intrusion that
5 could occur at that tear would be a very
6 small fraction of the gas drawn by any one
7 well, right?

8 A Well, no.

9 Q You disagree with that?

10 A Totally.

11 Q I may let you explain that, but right now
12 I'm going to ask you a lot of questions.
13 First, I want very precise about something
14 and I'm going to use a map that I marked
15 and I'm using it ahead of my marking as
16 Exhibit 5.

17 A Thank you.

18 Q So we can just kind of identify some
19 places. This is an update of a map that
20 was prepared by others but that your
21 company cloned and put its symbol on as
22 part of your report, right?

23 A Yes, and by no means was I trying to
24 suggest it was any of our, would. I was
25 just trying to make it easy for readers of

Rough draft

1 the report to be able to access
2 information.

3 Q And you'll notice I didn't say anything
4 offensive like plagiarism --

5 A Yeah.

6 Q And didn't imply that.

7 A Thank you. Anything like that.

8 Now, you see the line between the
9 South Quarry area and the North Quarry
10 area which is canted slightly so that it's
11 north northeast and south southeast and
12 half an inch long?

13 A You're talking about the dash line.

14 [Indiscernible - simultaneous speaking]

15 Q Dash line that is marked neck?

16 A I see it.

17 Q And is that what you speak of when you
18 refer to the line that is the neck?

19 A Correct.

20 Q Just to remind you of how this lines up,
21 you know that there are certain
22 temperature monitoring probes that have
23 been placed and that this line for that
24 defines the neck is in this line with
25 temperature monitoring probes 1, 2, 3 and

Rough draft

1 4, correct?

2 A I believe so. I would have to look, but
3 they're definitely in the general area
4 there.

5 Q You don't remember that they're exactly in
6 line with that?

7 A I have a recollection that those were the
8 first monitoring probes installed and they
9 were essentially in the neck, so I would
10 expect that that is correct that that's
11 the location for them, but without seeing
12 the map and the, you know, which I do
13 have, plot a much larger scale with all
14 the wells, I would want to confirm that.

15 Q And you should, but let me show you my
16 iPad which has the same exhibit called up?

17 A Zoom it.

18 Q I'll probably turn it and I'm going to
19 zoom in on the neck and see if you can
20 then confirm that that line is a connector
21 across temperature monitoring probes 1
22 through 4?

23 A Yes, absolutely now I see it crystal
24 clear, yes.

25 Q Thank you.

Rough draft

1 And while we're picking things out
2 on the map, just so it will be easy,
3 you'll see that GEW 39 is a few feet south
4 of the neck in the South Quarry, correct?
5 A I'll just locate --
6 Q It's near TMP?
7 A TMP 12.
8 Q And then GEW 109 which is the well you
9 were interested in when you wrote your
10 report is further south in the South
11 Quarry?
12 A Correct.
13 [Indiscernible - simultaneous speaking]
14 Q And so if one were concerned about
15 conditions at 109 and concerned about
16 migration of the reaction from affecting
17 109 to actually affecting the North Quarry
18 directly, there's sort of a sentinel well
19 in between which is GEW 39 which should
20 receive impact before the North Quarry
21 does, right?
22 A You would hope so.
23 Q If it goes in in the same direction it's
24 right in the path?
25 A As I believe I addressed this in my

Rough draft

1 report, in my experience, you know, in had
2 dealing with landfill fires and this I
3 think to some degree is similar, the
4 migration of particularly hot gases is,
5 you know, pathways of preferential high
6 permeability and so it may just wander
7 like an octopus, tentacles throughout and
8 could possibly to some degree, but in
9 principle I would agree.

10 Q Let me give you another sentinel and see
11 if that improves the situation.

12 A M'hmm.

13 Q Do you see GEW 56R is near TMP 15 and that
14 is south of the neck in the South Quarry
15 but still adjacent to the north line of
16 GIWs?

17 A I'm sort of positionally now is the North
18 Quarry up here? Thanks.

19 Q So now that we expand it or contract it
20 and then expand it back, is what I said
21 true?

22 A Okay, so.

23 Q 56R?

24 A Right.

25 Q Is in the South Quarry?

Rough draft

1 A
2 Q And it's South Quarry?
3 A Yes.
4 Q And it's about?
5 A Right there (witness indicates).
6 Q 56R is in the South Quarry and it is not
7 as close to the North Quarry as GEW 10?
8 A Yes.
9 Q 56R did you test that?
10 A Off the top of my head.
11 Q It would be on Exhibit 2, the blowup
12 chart.
13 A We would have to look at table 99 if I'm
14 not mistaken.
15 Q Yes, but the blowup is also exhibit --
16 [Indiscernible - simultaneous speaking] --
17 A Yes, I've got it filed at the same.
18 Q And did you at the time 56?
19 A It does not look like we tested 56.
20 Q Have you gone back if you're worried about
21 the North Quarry, have you gone back and
22 said well let me look next to 109 let me
23 look at 56 and then also let me not only
24 look at the 39 that we've talked about but
25 let me also look at 10 because it's closer

Rough draft

1 to the North Quarry than 56. Have you
2 done that?

3 A Basically I have not had the time to look
4 into the sort of the detailed spatial
5 chemistry around the neck.

6 Q And by chemistry you're just talking about
7 the chemistry of the gas?

8 A Yes, particularly with respect to carbon
9 monoxide levels.

10 Q Right. But let's say that this rather
11 large reaction occurring in the South
12 Quarry --

13 A Yes.

14 Q -- as opposed to acting as an octopus and
15 poking its finger in between the
16 monitoring points acts more like a wave
17 of something and moves towards the North
18 Quarry, what you would see if that were
19 happening would be impacts at GEW 39 and
20 impacts at GEW 10 on the way in, right?

21 A You would expect that, yes.

22 Q So one you told us may not be a good
23 sentinel now I've got two which if both
24 remain unimpacted collectively comprise a
25 decent sentinel, fair enough?

Rough draft

1 A Yes.

2 Q And between the two GEW 2 has the
3 advantage of being close to 56R and GEW 39
4 has the advantage of being close to GEW
5 109 so if you've got impacts affecting 56R
6 and 109 but you don't have impacts at 10
7 and 39, then you know that the effects of
8 the reaction have have gone so far and not
9 farther?

10 A I'm not prepared to draw that much of a
11 conclusion.

12 Q All right. I may leave that one to others
13 to draw and just ask you this next
14 question and that is: You would certainly
15 expect to see impacts, identifiable
16 discernible impacts at GEW 39 and at GEW
17 10 if the reaction were moving into the
18 North Quarry, at least at one of them?

19 A Eventually you would, yes.

20 Q And since our concern as a fundamental
21 part of your report is the reaction
22 entering the North Quarry, surely you've
23 looked at those data to prepare for your
24 deposition, haven't you?

25 A I've basically looked at well 109 and well

Rough draft

1 39 and concluded that, you know, the
2 reaction is basically somewhere in between
3 those locations and I've actually
4 developed a further hypothesis that I
5 believe that as a smolder reaction that
6 the reaction has basically gone from a
7 forward to a reverse mode and so probably
8 the velocity could be, you know,
9 significantly reduced.

10 Q And what you're saying, if I can translate
11 it into something closer to the words I
12 use every day --

13 A Yes.

14 Q Because I don't use these words every day,
15 is I think and you correct me, I think
16 what you're saying is that since you wrote
17 your report, since you looked at
18 additional data you've come to the
19 conclusion that the path of the reaction
20 now is reversed, is that true?

21 A No, no.

22 Q You have not come to that conclusion?

23 A No.

24 Q Okay. Have you come to the conclusion
25 that the reaction as a whole has a

Rough draft

1 settlement front?
2 A Settlement is an indication of the most
3 aggressive portion of the reaction, yes.
4 Q And that's useful because whereas a
5 settlement is a leading indication, other
6 parameters like temperature CO and
7 hydrogen are actually lagging indicators
8 and you get more indication about where
9 the reaction is going watching the front
10 of the --
11 A I haven't seen that in the data.
12 Q You haven't seen that?
13 A No, I believe what I indicated in my
14 report was that the settlement is
15 essentially concurrent with the pyrolysis
16 and, you know, the SSSER and the elevation
17 of hydrogen and the CO and then the
18 temperature seems to lag behind that
19 reaction front.
20 Q You treat temperature as lagging that way?
21 A It seems to build post-settlement or --
22 Q Okay, and so if you want to guess where
23 the temperature is going to go up, you
24 follow the settlement and say it's going
25 to come behind that, right?

Rough draft

- 1 A The highest increases, yes.
- 2 Q And did you as part of your report did you
- 3 the historic path of the settlement
- 4 between, let's say early 2013 and the most
- 5 recent data?
- 6 A Yes, and I believe there's an appendix
- 7 where I did some interpretations of the
- 8 elevated settlements and could see it move
- 9 around the landfill.
- 10 Q I saw the appendix and I actually thumbed
- 11 through it?
- 12 A Video, yes I did the same.
- 13 Q But I do have the question of what your
- 14 text says about it. What does your text
- 15 of your report said about the progress of
- 16 settlement in the South Quarry?
- 17 A I would have to read that section to tell
- 18 you.
- 19 Q Is there a section on that?
- 20 A Settlement, absolutely.
- 21 Q I thought I read this several times. Hold
- 22 on.
- 23 A I would like you to point you to section
- 24 8.5, probably page 63.
- 25 Q Thank you. Let me turn to that and I'll

Rough draft

1 read with you as you tell me what
2 conclusion you expressed and we'll see if
3 you still hold it.

4

5 Q All right. I'm in that section and I see
6 that there's a section titled Settlement
7 and I see that you describe Peter Carrie's
8 tracking of the settlement over time.

9 A Yes.

10 Q Rather than have you just try to capture
11 what's in it here because I've got a lot
12 of questions marked that I want to ask you
13 about specific words, let me just step
14 back to the overall.

15 Do you agree that the settlement
16 front since 2013 has moved to the south?

17 A Yes and do you agree that today the
18 settlement front appears to be moving to
19 the south.

20 A Yes, and to the southwest corner.

21 Q And do you agree that the speed of the
22 movement of the settlement front has
23 slowed?

24 A I believe so, yes.

25 Q If I refer to a value for the speed of the

Rough draft

1 movement of the settlement front as one
2 half foot per day, is that in line with
3 what you estimate it to be?
4 A Off the top of my head, my recollection
5 was that at the peak of its reaction, I
6 believe and I may stand corrected was
7 somewhere in the neighbourhood of 50 to
8 100 yards per month, right, so I believe
9 that's like 150 to 300 feet per month
10 divided by 30. So that would be 5 to 10
11 feet per day at the peak travel times.
12 Q You said that, but I didn't know what you
13 were talking about. What were you talking
14 about 5 to 10 feet per day?
15 A Correct.
16 Q That's 10 to 20 times what I said.
17 A Yes.
18 Q Okay. Where do you get that?
19 A So where I got that is, if I could
20 reference a map, give me one second to
21 find it.
22 Q Does it look kind of like this one?
23 A No. It's a -- it's basically an excerpt
24 from the main gas or well location map
25 with a bunch of hand drawn color contours.

Rough draft

1 I'm trying to remember where in the report
2 it is. Here it is. Figure 8 -19.
3 Q What page?
4 A Give me one second. Page 84.
5 Q My page 84 doesn't have a Figure 8-19?
6 A There it is.
7 Q After page 84?
8 A Yes.
9 Q So it's 85?
10 A Yes.
11 Q Tell me what this thing is.
12 A Okay, so what this is is a plot of the
13 days or approximate time that I observed
14 each of these wells transitioning through
15 that step 3 into step 4 which is basically
16 what I believe is the aggressive SSSER
17 initiating, and then basically I measured
18 the duration between the reaction being
19 observed at that well and then the next
20 well and then essentially looked at the
21 amount of time it took to get there and
22 determined basically in my approximation a
23 much more accurate way of judging the
24 spread of the SSSER than any, you know,
25 surficial settlement or any other data in

Rough draft

1 my mind that step 3 to step 4 is the
2 critical marker for the initiation of the
3 reaction.
4 Q well, I'm going to have to talk about your
5 five steps then, I guess, because you keep
6 coming -- you keep pulling me back to it.
7 In the simplest terms, can you list
8 the five steps that you talk about in your
9 report?
10 A Yes, I would like to -- they're written up
11 and again find -- they're exactly listed.
12 Q That's fine, but help me communicate by
13 making them simple.
14 A Yes, and I believe that they are very
15 simple and if we turn to page 79 they are
16 basically described and there's a figure
17 that actually shows them.
18 Q Page 79?
19 A Yes, please. And actually probably the
20 figure before that is clearer on page 78
21 that shows all five of them.
22 Q Are you talking about Figure 8-17?
23 A Correct, 8-17 and 8-18.
24 Q So 817 and 818 are about the 5 steps?
25 A Absolutely.

Rough draft

1 Q All right. Well, let me step back then.
2 Before I have you put names on the five
3 steps, can you ever -- can you identify
4 one writing on earth other than your
5 report in this case which has ever
6 referred to these five steps in sequence
7 as constituting anything that exists?

8 MS. WHIPPLE: Objection to form and
9 argumentative.

10 THE WITNESS:

11 A No, I believe this is a contribution to
12 the growing understanding of subsurface
13 exothermic reactions. I think it's one
14 that people really need to look carefully
15 at because it's in my mind all the wells
16 exhibit exactly all the same patterns of
17 response.

18 MR. BECK:

19 Q This is your invention?

20 A This is my interpretation of the data.

21 Q But it's an interpretation that no one has
22 ever written like this before or since to
23 your knowledge?

24 A Correct.

25 Q And not just as to Bridgeton but as to any

Rough draft

1 event in the world?

2 A Yes.

3 Q Is there a piece of literature, technical
4 literature, not a letter from Dr. Grace, a
5 piece of technical literature that defines
6 this alleged five step process that you
7 purport to depict on these two drawings?

8 A The only place you'll find it most likely
9 is in my report.

10 Q Of all writings in the world?

11 A I have not come across in my research
12 anything like this. I would say, you
13 know, it's very rare that people would be
14 measuring hydrogen. I think there's very
15 few landfills in the world that are doing
16 that and to actually have such a detailed
17 data set I would suspect there's probably
18 if Bridgeton is probably not the other one
19 there's probably two or a few in the world
20 so it's pretty rare to study a data set
21 like this.

22 Q So among your five steps that comprise the
23 progress of this reaction that you've come
24 up with, step number 4 is the water-gas
25 shift reaction, otherwise known as

Rough draft

1 torrefaction?

2 A I believe step 4 involves a lot of things
3 are going on because you'll see that
4 there's typically a fairly significant
5 increase in had heat and fairly radical
6 changes in chemistry. Some of that is
7 explained by the water-gas shift reaction
8 but I may be wrong on that. There's
9 certainly some kind of chemical reaction
10 at that point in time that goes on where
11 you see some pretty radical changes in in,
12 you know, in the gas chemistry and.

13 Q I'm just reading the heading you wrote for
14 that section it says step 4
15 torrefaction/water-gas shift was that your
16 heading?

17 A Yes.

18 Q And you've acknowledged already that among
19 the things in which you are not an expert
20 is you are not an expert in torrefaction
21 or the water-gas shift reaction, correct?

22 A Correct.

23 Q Is torrefaction endothermic or exothermic?

24 A Based on my research and certainly the
25 opinion of Dr. Grace torrefaction is

Rough draft

1 considered low temperature pyrolysis
2 and -- and I believe that all pyrolysis
3 reactions are an endothermic reaction.
4 There is some literature that suggests
5 some people in rare instances found some
6 exothermic scenarios, but I'm not sure if
7 I really believe them, but then I'm not an
8 expert in that area, so I don't want to
9 provide an opinion on that other than to
10 say that the vast majority of pyrolysis
11 reactions are known to be endothermic
12 reaction where you have to add heat to
13 make them happen.

14 Q But this calculation you did that resulted
15 in a migration rate of 5 to 10 feet per
16 day depends on one's acceptance of your
17 five step explanation, correct?

18 A Yes.

19 Q And if for any reason the jury decides to
20 not accept your 5 step explanation, then
21 one must also discard your five to 10 feet
22 migration rate?

23 A I would not go so far in my conclusion.

24 Q Right, but that's because you're you. I
25 am saying if the decision maker says, you

Rough draft

1 know, interesting theory, but I'm not
2 prepared to adopt it as a fact of the
3 case, then the underpinning for your 5 to
4 10 feet per day migration rate is gone?
5 A To be crystal clear on this, right, like I
6 think that any layman will recognize when
7 reviewing the data that there's a rapid
8 acceleration in temperature stage 3 at
9 some stage 4 and I believe that's the
10 clear signature of something happening in
11 that well and what exactly it is I believe
12 that is the best marker that rapid
13 increase in temperature and, you know, and
14 an uneducated layman would be able to see
15 that in all the records and if you were to
16 ask, you know, what point is something
17 going on here where temperatures go above
18 131 degree Fahrenheit point and start
19 climbing up through the roof that that
20 would be clearly an indication that that's
21 when things happen.
22 Q So in your opinion this is something that
23 you don't have to be an expert or a
24 specialist in to get -- ordinary people
25 can understand this just by looking at

Rough draft

1 the data properly depicted, correct?

2 A Yes.

3 [indiscernible - simultaneous speaking]

4 MS. WHIPPLE: Objection. Misstates the witness's
5 full testimony.

6 MR. BECK:

7 Q That's what you said, isn't it?

8 THE WITNESS:

9 A Yes, that's what I would conclude, yes.

10 MR. BECK:

11 Q Now, maybe you'll agree with this: will
12 you agree that?

13 MR. BECK:

14 Q The settlement front does not move at 5 to
15 10 feet per day?

16 A I believe that to be possible, but I have
17 not analyzed the settlement front travel
18 time.

19 Q How far has it gone in four and-a-half
20 years how far has it gone? 500 feet?

21 A Oh no, it would be more than that.

22 Q You think so from where it started?

23 A Yeah, it's sort of gone around the
24 landfill, so it might be 300, 400 yards.
25 I would have to pull the map out and.

Rough draft

- 1 Q That's a very low rate compared to the
2 rate you're talking about, right?
- 3 A Correct.
- 4 Q Okay. So is there some simple variable
5 that is easy to measure, you know, you can
6 measure a place where settlement is
7 occurring because you can measure
8 settlement. You can measure the rapidity
9 with which it occurs and that's what Peter
10 Carrie does, right?
- 11 A M'hmm.
- 12 Q Yes?
- 13 A Yes.
- 14 Q That's what he maps?
- 15 A Yes.
- 16 Q And you can measure spelling Carrie /C
17 measure the changes in temperature in
18 individual data monitoring points like gas
19 extraction wells and see how fast a rise
20 in temperature is at this well and then it
21 is at the next well?
- 22 A Yes.
- 23 Q And you can look at changes in carbon
24 monoxide values and see when the next well
25 further is affected by an increase in

Rough draft

1 carbon monoxide values because you can
2 measure it, right?

3 A Yes.

4 Q Doesn't require five steps. Doesn't
5 require interpretations. Doesn't require
6 highlights on graphs at angles. You can
7 just measure it, right?

8 A Yes /(.

9 Q Did you do anything you know how we talked
10 about thumbing through those settlement
11 maps in order to see what the path of
12 settlement has been on kind of a gross
13 visual scale?

14 A Yes.

15 Q You did that, right?

16 A Yes.

17 Q And what you found is that the settlement
18 front has gone away from the neck and in
19 an encloses-wise direction around the
20 South Quarry?

21 A Correct.

22 Q And the place where it seems to be
23 occurring most recently is about as far
24 from the neck as you can get?

25 A Yes.

Rough draft

1 Q And you can also see visually if you thumb
2 through the appendix of your report that
3 is the CO data?

4 A Yes.

5 Q And which is color coded, that the CO data
6 show no progress to the North Quarry over
7 time, right, no significant progress?

8 A Yeah, I would say it's significant because
9 when I looked at the most recent data on
10 the internet just the last couple days ago
11 I did note that there were one or two in
12 the temperature probes sort of continued
13 to escalate upwards.

14 Q You're on temperature. I'm on CO?

15 A I cannot do that.

16 Q As you thumb through the CO mapping
17 couldn't you see that the progress of the
18 CO never really bothered the North Quarry?

19 A Yes.

20 Q Okay. And did you do the same thing with
21 the hydrogen mapping?

22 A I would have to look in my appendices.
23 Like what I did in terms of the detailed
24 analysis was the plots in the hydrogen. I
25 don't have a reaction now if I did or not.

Rough draft

1 I would have to look at all my analysis.
2 I certainly did CO. I did temperature and
3 I did settlement. I'm not 100 percent
4 sure if I looked at hydrogen.

5 Q And I actually had some of that animated
6 in had movies I'll show you in a little
7 bit?

8 A Yes.

9 Q All it is is just this one fading into
10 fading into this one so you can get
11 impression from the movie?

12 A Yes.

13 Q So I'll show you that and let's see if I
14 can make this even a little simpler.

15 If you had gone out to Bridgeton
16 Landfill in early 2013 and seen the data
17 at well 109 then, you would have formed
18 the exact conclusion expressed in your
19 report which is that the reaction impacts
20 are beyond the gas interceptor wells.
21 It's time to worry about the North Quarry,
22 yes?

23 A Yeah, if the fuel was elevated and my
24 reaction is it's somewhere around 2013
25 that that well 109 was initiated then,

Rough draft

1 yes.

2 Q Now, one of the things you say in your
3 report and it will resonate with you
4 because you've read about it in several of
5 those Google alerts that you've been
6 getting since you submitted your report is
7 that the time projection referred to in
8 your report of three to six months has
9 taken on some public significance. Am is
10 that true?

11 A That's my impression, yes, I think people
12 were not reading very carefully what my
13 report said.

14 Q Yeah, tell people what your report
15 actually said. Just phrase it in your own
16 words.

17 A Basically what I said is that looking at
18 the map on which I base my transition from
19 step 3 to step 4 as the indicator of how
20 quickly the reaction was spreading that at
21 that time it basically took between
22 essentially that the spread of reaction
23 was occurring at 50 to 100 yards per month
24 and I said --

25 Q Based on your calculations?

Rough draft

1 A Based on my calculations and I said the
2 conditions throughout the North Quarry
3 are -- I had no information that would
4 suggest that the conditions in the North
5 Quarry are significantly different than
6 those from the South Quarry and as a
7 prudent I would say engineer to I draw the
8 conclusion that what happened in the past
9 could well happen again and that's
10 basically my conclusion to say, you know,
11 that it's not unreasonable to conclude
12 that for whatever reason, if the reaction
13 decides to take off again, it could be
14 migrating burning through the North Quarry
15 at the same rate as it did in the South
16 Quarry.

17 Q And what you were describing and the word
18 you used was conceivably, right? Do you
19 want to see it it's on 111.

20 A Please, yeah, I'll turn to 111.

21 Q Third paragraph from the bottom, second
22 sentence.

23 A Yeah, still getting to the page.

24 Q Of course. It's much easier when you're
25 already on the page when you're asking the

Rough draft

1 question.
2
3 A Yes.
4 Q The word you used was conceivably, right?
5 A I'm just trying to find that.
6 Q It's the third paragraph from the bottom
7 the second sentence it says based on
8 observed rates?
9 A I'm looking at page 111, third paragraph
10 from the bottom.
11 Q Starts at the present --
12 A Based on observed rates of the SSSER
13 spread at high temperatures could
14 conceivably reach in three to six months,
15 yes.
16 Q You say conceivably?
17 A In my mind conceivably means it's
18 possible.
19 Q Right, and so what you were saying is I
20 found evidence of reaction impacts beyond
21 the gas interceptor wells, the two gas
22 interceptor wells at 109 you didn't
23 realize that at the time you wrote that
24 was very old news?
25 A Yes.

Rough draft

- 1 Q You didn't see any impacts at 39, the very
2 next well to the north, but you did a
3 calculation based on your five step theory
4 that the reaction could move 5 to 10 feet
5 per day if P your calculation is right and
6 your theory is right and, therefore, said
7 so if the reaction did cross into the
8 North Quarry, if it did head straight for
9 the rad materials, if it did go as fast as
10 my calculation would show it has ever
11 gone, then a simple division of 900 feet
12 by 150 to 300 feet per month yields a
13 value of three to six months?
- 14 A Correct. That's the logic I useded.
- 15 Q What you didn't say was the reaction was
16 in the North Quarry. You didn't say that,
17 did you?
- 18 A No.
- 19 Q You didn't say the reaction is in my
20 opinion going to move into the North
21 Quarry now next week, or at some
22 predictable time in the future, did you?
- 23 A No.
- 24 Q You didn't say that the reaction, if it
25 reaches the North Quarry, will, in fact,

Rough draft

1 go the highest rate I think I have ever
2 calculated it going before. You just said
3 I worry about things like that because I'm
4 an engineer?

5 A Yes.

6 Q And that's why you used the word
7 conceivably which equates to possibly?

8 A Yes.

9 Q And if there are people out there calling
10 for evacuations and calling for a state of
11 emergency and running disaster
12 preparedness drills and scaring the hell
13 out of the people of St. Louis County
14 because you said that, then that's really
15 taking it a lot further than you intended,
16 right?

17 A Correct.

18 Q Okay, thank you.

19
20 Q Did you not have any conversations with
21 the Attorney General's office about that
22 part of your report at the time you
23 submitted the report or around the time
24 you submitted your report?

25 A No, I submitted my report on the day I

Rough draft

1 went on vacation for a three-week holiday
2 in iceland and I had no communication with
3 the Attorney General at all.

4 Q Did anyone contact you by e-mail text
5 voicemail or otherwise and say let me make
6 sure I understand what this means before I
7 go public telling people to be afraid?

8 A No.

9 Q As part of your preparation for this, has
10 anyone shown you the countdown clock?

11 A No.

12 Q There was a time a few years ago when one
13 person said oh, the reaction is about a
14 quarter mile from the radiologically
15 impacted material and shortly after that
16 the Attorney General of Missouri got up in
17 front of the press and said oh, the
18 reaction is about a thousand feet away
19 from the radioactive material and some
20 members of the public said oh, well then
21 the reaction has moved 320 feet in a very
22 short time. We only have this much time
23 left, a short amount of time left before
24 the reaction hits the radiologic material
25 and in order to show people how scary the

Rough draft

1 situation was, they actually had on the
2 web a clock that was running out of time
3 to show how much time there was. Doesn't
4 that sound to you a little like what
5 you've been reading in the paper?
6 A what I've been reading in the paper
7 definitely there's a lot of appears to be
8 a lot of concern in the community about
9 the radiological waste.
10 Q Sure.
11 A And I've also come across discussions
12 about evacuation plan prepared by the
13 Deputy fire chief and it seems to me that
14 that concern predates the date of my
15 report that that's a fairly serious
16 concern in the community.
17 Q A politician released an evacuation plan
18 in the very middle of your report.
19 A In terms of release of the public.
20 Q
21 A I have no comment or no control of what's
22 being done with respect to my report.
23 Q But you can do this and you have done this
24 and that is you've explained what you
25 intended people to get from your report

Rough draft

1 and that's what your testimony is today?

2 A Yes, yes.

3 Q Just to make sure that this much is clear,
4 we asked the people who maintain our gas
5 data to just graph the CO at GEW 109 the
6 well that you checked that got this
7 discussion started.

8 A M'hmm.

9 Q Going back to when this data generateded
10 which is 2013?

11 MS. WHIPPLE: Is this Exhibit 6.

12 MR. BECK: This is Exhibit Number 3. We're
13 picking up and going backwards.

14 MS. WHIPPLE: Thank you.

15 THE WITNESS: Okay.

16 MR. BECK:

17 Q Is what this graph depicts as kind of
18 historic and trending CO data for GEW 109
19 consistent with what Dr. Abedini told you
20 earlier this week?

21 A Yes.

22 Q And after he told you that oh, 109 always
23 had impacts, did you go back and actually
24 look at the data this this graphs, go back
25 and look at the historical data?

Rough draft

1 A I looked at our graph for well 109 and it
2 essentially shows the same, the same
3 trends.

4 Q Okay. And then for GEW 39 which is the
5 well that is not impacted that is on the
6 North Quarry side of GEW 109 but still in
7 the South Quarry, for that did you go back
8 and look at the data for that one, too?

9 A No.

10 Q 4, is the graphing for those that go back
11 further in time and, if anything, what 4
12 shows us is that the CO levels at 39 have,
13 if anything, improved, fair enough, over
14 time?

15 A With the exception of the two spikes
16 around --

17 Q It's just one, isn't it?

18 A Well, there's a minor one between July
19 12th and January and a big one on January
20 13th basically seems to be two sample
21 points there. Beyond that I see kind of a
22 flat trend line going up a little bit and
23 then decreasing a little bit.

24 Q In had 2015 it's a good trend?

25 A Possibly. I would need more information

Rough draft

1 to make that conclusion.
2 Q At least there's no recent evidence that
3 GEW 39 has impacted?
4 A Correct. I would say that the SSSER is
5 not 39 at this time.
6 Q Okay.
7 Now, let's say that rather than --
8 well, let me step back. Maybe you don't
9 know this. Do you know what agency is in
10 charge of the decision to which you speak
11 in your report about whether, when and how
12 to construct an isolation barrier?
13 A Specifically with respect to the
14 legalities of it, no.
15 Q Just who is in charge.
16 A I believe that MDNR reviews data and
17 generally proposes I shouldn't say
18 proposes. Reviews data and approves that
19 things be done and then there are some
20 orders that are issued and I'm not sure
21 how those work.
22 Q Let me just ask you this much: I know you
23 worked on one of the superfund sites the
24 one up in this Washington?
25 A Right.

Rough draft

1 Q And since that was a federal, national
2 prior list superfunds site, was the EPA
3 involved?

4 A They were.

5 Q And was EPA essentially the decision-
6 making agency for that because it was a
7 federal national priority of those
8 superfunds site?

9 A They seemed to be the people making the
10 decision on things to happen.

11 Q which means they wouldn't listen to the
12 state but they were the decideers?

13 A Yes.

14 Q And did you know that the Bridgeton
15 Landfill that you've been doing all this
16 writing about is also a federal national
17 priorities list superfunds site, it's part
18 of one?

19 A I know that parts of it are. In terms of
20 the actual how it's delineated because
21 I've heard that west lake landfill and the
22 radiological area seem to be the superfund
23 area. I'm not sure if all of it is
24 encompass the. I don't know that.

25 Q So if I tell you that EPA actually has

Rough draft

1 published major decision documents laying
2 out the boundaries of the federal national
3 superfunds site that they're in charge of
4 and those boundaries include not only the
5 radiological areas in west lake landfill
6 but also include the Bridgeton Landfill,
7 you don't know that to be true or false?

8 A I don't know that to be true or false.

9 Q Has anyone claimed to you that the state
10 has any authority to decide what remedial
11 actions are taken in had any part of the
12 whole landfill complex?

13 A No.

14 Q Okay. So getting back to my question
15 which is do you know which agency, maybe
16 this was my question, if it not, it it is
17 now, here's my new question: Do you know
18 which agency is making the decision
19 whether, when and how to isolate thele
20 radiologically impacted materials from the
21 reaction in the Bridgeton Landfill South
22 Quarry?

23 A No, I do not. My -- well, I'll leave it
24 at that.

25 Q Have you seen the administrative order

Rough draft

1 that is currently outstanding under which
2 EPA is in control of that activity?

3 A I have seen an administrative order
4 reporting that certain actions be taken.
5 I'm trying to recollect. I've looked at
6 so much information, but I believe it was
7 a -- I did not note that it was an EPA
8 order. My impression was it was a state
9 order.

10 Q You may be talking about the preliminary
11 injunction that contained reference to the
12 North Quarry contingency plan. .is that
13 what you're thinking about?

14 A It rings a bell.

15 Q I'm thinking about something else. I'm
16 thinking about an actual EPA order issued
17 much more recently than that under which
18 EPA is in charge of the question of should
19 we build an isolation barrier of some
20 kind, should it be physical, should it be
21 thermal, like cooling. Should it be
22 located along this alignment or that
23 alignment considering what we know about
24 the placement of the radiologic materials.
25 You haven't seen an order like that?

Rough draft

1 A No, I did not.

2 Q Okay. Now, do you know that EPA is
3 presently in in possession of monitoring
4 data and technical reports so that before
5 the end of this year it will make that
6 decision about whether there should be an
7 isolation barrier and if so, what it
8 should look like?

9 A I was not aware of that.

10 Q Okay.

11 Now, one of the things that you
12 suggest in your report is, and I
13 understand your engineer's concern about
14 the possibilities of risk. I understand
15 that you would like something put in place
16 soon because you think that would make
17 everyone rest easier, but have you seen
18 any of the of the information that shows
19 the precise locations where more recent
20 detections of / (radiologically impacted
21 material have occurred in reference to the
22 North Quarry on the westlake side?

23 A westlake.

24 A I have not seen any information other than
25 I heard discussions that radiological

Rough draft

1 waste has been encountered on the
2 property.

3 Q Okay. Now, you described a little bit
4 about your understanding of the
5 radiological material. You haven't done
6 any kind of a deep dive study of what that
7 material is?

8 A No, sir.

9 Q There is a document, it happens at every
10 federal superfunds site that is called the
11 remedial investigation that identifies the
12 nature and extent of contamination as it's
13 been identified by studies and approved by
14 the agency.

15 Have you read the remedial
16 investigation for westlake?

17 A No.

18 Q You've made certain assumptions in your
19 report about potential risk in the event
20 the reaction, whenever it could come in
21 contact with the radiological material.
22 Do you know that there has been an EPA
23 required study of what, in fact, would
24 happen if, as no one as EPA says it
25 doesn't expect, the reaction were ever to

Rough draft

1 cock in contact with some of the
2 radiologically impacted material? Have
3 you read that study?
4 A No.
5 Q It's called the SSE report it's on EPA's
6 website. You haven't read it?
7 A No.
8 Q Did you know EPA actually reached out to
9 their national kind of science advisors
10 and a group called the office of research
11 development to review that report and
12 provide them comments on what that event
13 would look like if God forbid it were to
14 occur?
15 A No.
16 Q You've not read those comments?
17 A No, sir.
18 Q And so for the material itself I know you
19 described it as radiologically impacted
20 I know you referred to the phrase barium
21 (phonetic) sulphate which is about
22 two-thirds of the definition. Did you
23 know that the actual definition in the EPA
24 document is leached barium sulphate?
25 A Yes, I did.

Rough draft

1 Q And you're familiar with the term leached
2 because in landfills we have things that
3 leach and form things that's called
4 leachate?

5 A Yes.

6 Q And do you gather from the fact that the
7 barium sulphate was leached that there was
8 some process applied to it for the purpose
9 of scavenging the valuable minerals out of
10 it and what was left behind was leached?

11 A Yes.

12 A Yes.

13 Q And so that would typically be a lower
14 strength radiologic material than
15 unleached barium sulphate?

16 A Yes.

17 Q Have you done anything to look at the
18 study that was done at the westlake site
19 and approved by EPA identifying what are
20 the risks of that material as it currently
21 stands as it's currently sitting in the
22 ground and in the ground, what risks it
23 poses to human health and the environment
24 if any?

25 A Very limited.

Rough draft

1 Q Have you read that many some place?
2 A I researched it on the westlake sent and
3 sort of gave a bit of a big picture
4 synopsis.
5 Q Did you read the place where the regional
6 administrator the most recent regional
7 administrator of region 7 of EPA Carl
8 Brooks said that as long as somebody
9 doesn't actually trespass inside the
10 barbed wire fence on the property, they're
11 in no danger?
12 A No.
13 Q For the SSE report, if I tell you that one
14 of the approved conclusions with which EPA
15 had had no agreement of the SSE report is
16 that it is not capable of being exploded
17 in in the presence of heat. Do you know
18 if that's true or false?
19 A I do not, but it sounds reasonable to me.
20 Q And if I tell you that one of the
21 conclusions it's not capable of being
22 vaporized into the atmospheric even if it
23 were intense heat, do you have any
24 information about that one way or the
25 other?

Rough draft

1 A No /(.
2 Q Does it sound right to you, though, based
3 on the nature of the material?
4 A I would not want to comment on that
5 because I don't have the expertise in that
6 area to make a sound opinion.
7 Q But you know that that's something that
8 doesn't often occur with metals. It's a
9 metal?
10 A In terms of being vaporized?
11 Q Yes.
12 A Yes, it's superhigh heat.
13 Q Here in Bridgeton Landfill the highest
14 heat is just under 300 degrees?
15 A The highest measured heat.
16 Q I understand and I understand you've got
17 something to say about that.
18 A Yes.
19 Q And if I tell you that the result of the
20 SSE report that was uncontradicted by
21 EPA's researched arm's (phonetic) /(
22 review of that report, is that the only
23 thing one might expect in the event the
24 reaction reached the radiologic material
25 is that ground would crack and the

Rough draft

1 cracking of the ground would expose to the
2 atmosphere radon gas from radiologic
3 material that otherwise would have stayed
4 in the ground and dissipated and therefore
5 had some unquantifiable increase in radon
6 emission beyond what's already occurring.

7 Do you have any reason to agree or
8 disagree?

9 A Yes, I have some reasons to disagree.

10 Q Go ahead.

11 A Basically going back on my experience with
12 landfill fires and that is that basically
13 the biggest pathway for relieve of for
14 landfill is through smoke and dust and my
15 concern is that in that area of OU-1 that
16 basically there's a combination of regular
17 MSW and demolition-type material and with
18 the kind of temperatures that we're seeing
19 in the subsurface area that I could see
20 that, you know, if that reaction moves
21 especially into the surface into a
22 conventional fire, that there would be an
23 opportunity for release of particulate
24 matter into the atmosphere and I see
25 that --

Rough draft

1 [indiscernible - simultaneous speaking]

2 Q And ash goes into the atmosphere and if
3 it's absorbed into a radio newcloud
4 (phonetic) particle, that could go with
5 it? spelling

6 A Yes.

7 Q I hear you. And did you know that that
8 was one of the scenarios and risks that
9 was examined in the SSE report?

10 A No.

11 Q And so one of the things that you would
12 want to do more or less today than you are
13 today when you have some time comfortable
14 you would consider it useful to review the
15 SSE report and the comments on the SSE
16 report?

17 A Sounds like a reasonable thing to do.

18 Q Because, if nothing else, it would be
19 information to show that this is not an
20 unstudied problem?

21 A Yes.

22 Q Now, if the reaction simply remains
23 contained in the South Quarry until it
24 stops occurring, whenever that is, then
25 there's no actual risk. There's concern,

Rough draft

1 but there's no actual risk of migration of
2 the reaction into the North Quarry to the
3 radiologically impacted material, right?

4 A Yes in my mind the if is is a questionable
5 if.

6 Q I hear you. I hear you, but is it your
7 opinion that the gas interceptor wells
8 were an innovative technology?

9 A I believe it's my opinion that they were
10 or appear to be effective in containing
11 that reaction. I would say that if I had
12 been designing them, that it seemed to me
13 like they were placed actually ahead of
14 the reaction front at the time which to me
15 did not make sense.

16 Q Can I make sense of it for you?

17 A Sure.

18 Q What you're saying is you put them right
19 in the heart of it to get as much or
20 cooling or thermal release out of it as
21 you could?

22 A No, what I'm concerned about and I
23 mentioned in my report is basically that I
24 feel that most effective or one of the key
25 pathways for heat transfers for by

Rough draft

1 migration of steam and basically conduct
2 a flow towards the well.

3 And so you're -- if you have a fire
4 here and put your line of so you're
5 drawing that heat towards the wells and
6 actually drawing it in the opposite
7 direction to where you want it to go.

8 Q Right, so as opposed to confining it,
9 you're actually pulling it --

10 [Indiscernible - simultaneous speaking]

11 A Yes, forward.

12 Q They've still been effective?

13 A And possibly once the reaction class moved
14 around 109 suggests they're now actually
15 pulling that heat back and slowing that
16 spread or maybe even containing it.

17 Q Did you say that you thought that the idea
18 of cooling elements as proposed by Peter
19 Kelly made more sense to you than the gas
20 interceptor wells or did I misunderstand?

21 A No, at least certainly it's been a while
22 since I wrote this and I've tried to
23 review it, but my biggest perception was
24 that I -- at the time I was reviewing the
25 reports there were SCS was proposing and

Rough draft

1 Peter was proposing the cooling loop and
2 the decision was to go to GIWs and I did
3 not come across a logical rationale why
4 that other approach I'm not saying it's
5 not out there. That was surprising to me
6 and I had some reservations with the
7 cooling lap and I think I mentioned that
8 in the report is that in my experience
9 solid waste is a very good especially MSW
10 in contrast it's a very good insulator and
11 so I'm not sure how effective the cooling
12 loop, you know, a well with a very cool
13 well how far far it would reach out and
14 how effective one a 1 metre spacing or a 5
15 metre spacing. I don't know.

16 Q I hear you. And so do you know whether or
17 not the gas interceptor wells were
18 partially converted into a cooling loop
19 subsequent to their construction?

20 A I seem to recollect reading that they
21 were, but I did not notice while on site,
22 but there's so many pipes around that I --
23 I recollect reading about it, but in
24 passing, but I have no, you know,
25 definitive information on how many and how

Rough draft

1 effective it is.

2 Q Did you know that there was recently
3 published a study of how many and how
4 effective it is?

5 A No.

6 Q Has anyone shared with you from the
7 Attorney General's office or the Missouri
8 Department of Natural Resources, has
9 anyone shared with you the recently
10 submitted pilot study for the cooling
11 system? It was August.

12 A Yeah, I received, like one additional zip
13 drive and in all honesty I've been crazy
14 busy in my office other than I've had no
15 time to crack stuff open.

16 Q So the answer would be if it's on there
17 you haven't read it yet?

18 A Yes.

19 Q And have you stayed up to date with the
20 weekly data submissions by Bridgeton
21 Landfill to the Missouri Department of
22 Natural Resources which were then
23 available to the public over the internet?

24 A Not on a continuous basis. I scanned the
25 information once since I returned from my

Rough draft

1 vacation.

2 Q If I was to ask you to assume based on the
3 most recent one last week that GEW 10 and
4 GEW 39 remain below the level that you
5 regard as impacted, would that make you
6 feel better about time questions?

7 A It certainly provides a small level of
8 comfort, but if I may expand on that a
9 little bit because I think it's important,
10 you know, as a professional engineer, I
11 feel one of my quotes is to negotiation
12 take public health and protection of
13 environment both as paramount things and
14 you weren't clear on the reverse smolder
15 process and what it is is like when you
16 have a smolder like the gas can either be
17 heading in the same direction as the flame
18 and that's called a forward smolder and
19 essentially that's what I believe started
20 initially and once the reaction moved to
21 109 it's kind of on the opposite side of
22 the GIWs and then we're into possible
23 reverse smolder where the flame front or
24 reaction front is moving away from the
25 GIWs and at that point typically the

Rough draft

1 reaction rate is much slower and that's
2 the concern I have is if it's now into the
3 reverse smolder once if it were to
4 continue moving at a slow rate the further
5 it gets away from the line of GIWs the
6 less influences they have and it could
7 accelerate again.

8 Q But the place we would see that if that
9 were happening, the place we would see
10 that you would see it in GIW or GEW 10 and
11 39, that's one place, right?

12 A Yes.

13 Q You would see it in TMP's 1 through 4?

14 A Yes.

15 Q You would see it in the North Quarry
16 temperature?

17 A Yes.

18 Q You would see a lot of signs of it
19 occurring that would tell us not only it's
20 happening but here is the pace at which
21 it is travelling if that ever were to
22 occur, right?

23 A Yes.

24 Q Now, let me ask you this: The water table
25 in a landfill is the top of the

Rough draft

1 continuously saturated zone, is that a
2 fair definition?
3 A It is, yes.
4 Q There can be lensing of saturation that's
5 not what we're talking about about the top
6 of the continuously saturated?
7 A Yes, we call it perched water.
8 Q A real water table, sorry, a real water
9 table is the continuously saturated zone?
10 A Yes, sir.
11 Q And do you know how often water levels get
12 measured throughout this landfill?
13 A My impression was that it's part of their
14 monitoring I believe it gets done once a
15 month but I'm not 100 percent sure.
16 Q And so there are a couple or three or four
17 or six places in your report where you say
18 I really wish they would sound the water
19 levels currently like Aquaterra did back
20 in 2010 because that would be very helpful
21 information?
22 A Yes.
23 Q Did you not know that that was occurring
24 all over the landfill frequently?
25 A I did know.

Rough draft

1 Q Okay. And are you saying you would just
2 like to see it mapped?
3 A No.
4 Q what are you saying?
5 A My impression is what's being sounded are
6 the active gas extraction wells that are
7 actively pulling leachate out of the gas
8 wells and so the water level at the bottom
9 of the well is not representative of the
10 true water level, you know, within the
11 landfill. It just reflects how hard that
12 particular well is being sucked and how
13 high the water level is being drawn down.
14 Q Are there water levels in relation to
15 TMPs?
16 A I'm not aware of them -- my impression of
17 TMPs are but I may be wrong.
18 Q The kind of gas extraction well you were
19 talking about is the dual phase extraction
20 well which extracts both water and gas?
21 A Yes.
22 Q The GIWs are not dual phase, are they?
23 A I do not know.
24 Q Okay.
25 And if the water levels are taken

Rough draft

1 frequently at the GIWs, that would be
2 enormously helpful information, wouldn't
3 it?

4 A Yes.

5 Q Have you looked online or otherwise to see
6 if the water levels in the GIWs are
7 sampled periodically and reported?

8 A No.

9 Q Do you know whether or not they are
10 sampled literally every month and
11 reported?

12 A That would be -- I would certainly like to
13 look at that information. I would be
14 curious what the water levels in those
15 GIWs is because I think it's very
16 important to the analysis.

17 Q Right. You spent a lot of your time in
18 the report talking about water levels in
19 the?

20 A Yes.

21 Q And there's a lot of reasons and I'm going
22 to summarize a few. Don't think I'm
23 giving awe comprehensive list. One reason
24 you think water levels are important is
25 that you have concluded that the reaction

Rough draft

1 does not occur below the water table,
2 correct?

3 A Correct.

4 Q Do you still hold that view?

5 A I believe so, that, yes.

6 Q Okay. And if I can show you several
7 places where things in your own report
8 show that that's not true, will you at
9 least read them with a critical eye?

10 A Absolutely.

11 Q Okay. So let's talk about why you think
12 water levels are important now that we
13 know that it's based on at least one
14 reason is that you have the theory that
15 the reaction can occur under water?

16 A Many had many.

17 Q And that is m'hmm?

18 Q And that is you had took a look at the
19 idea of building an isolation barrier to
20 separate the radiologic material on one
21 side from any progress or reaction it
22 might make on the other and because you
23 concluded the reaction can't happen under
24 the water table, you decided the isolation
25 barrier wouldn't have to be all that deep

Rough draft

1 as long as you don't de-water the North
2 Quarry?

3 A Correct.

4 Q And that's because the water level in the
5 North Quarry is really high?

6 A Yes, to some degree. Looking at the 2010
7 data like I saw there's a fairly
8 significant drawdown it's shown maybe we
9 should turn to that figure.

10 Q The only question is whether the water
11 level in the North Quarry is really high.

12 A Yes, and it appears to be higher than the
13 South Quarry my impression is somewhere
14 between from 440 maybe up to 480 feet ASL.

15 Q Okay. Good. And do you have any reason
16 to say today that the water level in the
17 North Quarry has gone below 480 and when
18 you say that's above sea level?

19 A Correct.

20 Q Do you have any reason to think it's below
21 that now?

22 A Possibly again with the introduction of
23 the dual phase I'm not sure if there are
24 any North Quarry or not but if there are
25 there may be some impact to those and I

Rough draft

1 don't know what the pumping history of the
2 leachate sumps in the North Quarry.
3 Obviously if you pull harder on those
4 then, you know, they might have an effect
5 as well. I don't know.
6 Q Are there leachate sumps in the North
7 Quarry?
8 A I have a vague recollection of seeing
9 some, but I may be wrong.
10 Q Okay.
11 A I think there's five in total.
12 Q And so what you were or what you were
13 inferring with regard to this isolation
14 barrier that the construction might not be
15 so problematic because you key it in a few
16 feet and make sure you don't draw down the
17 water any lower?
18 A Right.
19 Q But if you're right that the reaction
20 can't occur below the water table, then
21 that provides complete containment because
22 you've cut it off above and the water is
23 below?
24 A Yes.
25 Q Do you know this idea, this question of

Rough draft

1 how much excavation would I have to do
2 to be -- to build an extraction barrier is
3 independently important not just because
4 of cost or time or odor?
5 A Can you repeat your question?
6 Q Sure. If you dig a big hole in the
7 landfill, it can take time?
8 A Yes.
9 Q It can cost money?
10 A Yes.
11 Q It can expose garbage?
12 A Yes.
13 Q Too fast
14 Q It can be problematic for the community?
15 A Without a doubt.
16 Q But apart from that do you know there's an
17 independent reason why there is a worry
18 about how much excavation would occur?
19 A I would assume that one of the concerns I
20 would have would be air intrusion and
21 exposure of the waste mass as probably,
22 you know, that would have to be managed.
23 Q Anymore?
24 A Slope stability would obviously be a big
25 factor. Relocation of the material where

Rough draft

1 it would go, but I think things like odor
2 you've already I believe touched base on.
3 Q Let me add one to your consideration.
4 When you went to Bridgeton Landfill, you
5 obviously left Vancouver British Columbia,
6 Canada and ended up after one or more
7 flights in St. Louis Missouri?
8 A Yes.
9 Q And then drove to the site?
10 A Yes.
11 Q Did you notice when you were flying over
12 Bridgeton Landfill that you actually
13 looked down at it?
14 A I did not notice because I think I flew in
15 in the darkness.
16 Q Could be. Do you know what the distance
17 is from Bridgeton Landfill to the nearest
18 runway at Lambert airport is?
19 A Not specifically, but I do know there's a
20 runway fairly close proximity to that
21 landfill.
22 Q Were you aware that the reason the
23 landfill closed on December 31st 2004 was
24 that the airport essentially condemned the
25 remaining air space and closing up the

Rough draft

1 landfill so that they could then build a
2 runway within two miles?

3 A I was aware of some interaction not
4 specifically that but there was some
5 interaction between the airport and the
6 landfill.

7 Q Has the Attorney General shared the
8 document that is referred to as the
9 negative easement? It's an actual real
10 estate document.

11 A Again possibly but I have not read it.

12 Q Okay. Do you have any awareness that
13 there exists a legal instrument under
14 which the airport has a property right in
15 the landfill itself that the /C airport
16 claims would be violated in the event we
17 dig up a bunch of garbage?

18 A Going back to my review of the subtitle
19 regulations and our Canadian regulations
20 have similar clauses that there are
21 typical exclusions for landfills away from
22 runways that's usually several kilometres
23 long, other than that I wasn't aware of
24 anything else.

25 Q The concern being bird strikes?

Rough draft

- 1 A Correct.
- 2 Q That you have exposed garbage birds can
3 can come feed on it and then if they fly
4 in the air they can get into the aircraft
5 and bring it down?
- 6 A Yes.
- 7 Q And what you didn't know was that there
8 exists a legal instrument under which the
9 Lambert airport asserts the right to
10 prevent or limit excavation into the waste
11 for any purpose including yours?
- 12 A Okay.
- 13 Q You didn't know that?
- 14 A No.
- 15 Q So was there any effort in the time that
16 you were compiling the recommendations
17 contained in your report to involve the
18 airport officials to determine whether
19 they agree or disagree with your
20 assessment and whether they would /C
21 permit or refuse the work that you're
22 suggesting?
- 23 A Yes, I think that typically my expectation
24 on that I didn't get into anywhere near
25 that level of detail and, you know, site

Rough draft

1 impact and things I would say if you were
2 to move into a more detailed assessment
3 of that, but certainly all I was
4 recommending is that due consideration be
5 given by knowledgeable people including
6 people who would be aware of all of these
7 things to assess that kind of measure.

8 Q That's actually a fair observation and I
9 want to punctuate it. In your report you
10 make several recommendations, but all of
11 them are recommendations that items be
12 considered, studied, looked at by people
13 with the requisite expertise and decisions
14 made following that process.

15 A Yes.

16 Q You're not asking anyone to build things
17 or flood things without doing those
18 studies?

19 A That's correct.

20 Q Even the portion of your report which
21 recommends rapidly flooding the South
22 Quarry in order to provide heat
23 dissipation in the liquid is a
24 recommendation to consider an action, but
25 it must be reviewed by people with the

Rough draft

1 proper credentials including groundwater
2 professionals who have that concern and
3 chemistry professionals, the Dr. Grace
4 types who can tell creating more of a
5 problem than you're solving?

6 A Yes.

7 Q And until those evaluations occur you're
8 not recommending anyone put a pipe up into
9 the landfill and fill 'er up?

10 A Absolutely not.

11 Q And I just want to make sure this is
12 clear. A lot of your background and
13 expertise is is actually in groundwater?

14 A Correct.

15 Q It wasn't your Ph.D. thesis about
16 groundwater?

17 A Yes, in fact about de-watering of open pit
18 mines which is somewhat similar to the
19 quarry that we have here.

20 Q Understood. Do you know why it is you
21 were retained to talk about the things you
22 were but not to talk about groundwater?
23 why there were other people chosen to be
24 the state's experts on groundwater
25 questions?

Rough draft

- 1 A No.
- 2 Q Go ahead.
- 3 A I would reason that my profile as is is a
4 landfill fire expert is for far more
5 reaching in the North American area that
6 if you look at Google me, I think there
7 would be a lot more, you know, recognition
8 that I have this expertise in landfill
9 than I do in groundwater relating to open
10 pit mines and quarries.
- 11 Q In all events it wasn't within the scope
12 of your assignment the to be the
13 groundwater expert in this case and you're
14 not here to give groundwater opinions?
- 15 A Correct.
- 16 Q How far am I into this tape?
- 17 THE VIDEOGRAPHER: 20 minutes left.
- 18 MR. BECK: I'll do some more.
- 19 Q Dr. Sperling, in connection with the name
20 of your Company Landfill Fire Control Inc.
21 website which is landfill how many
22 landfills have you worked on?
- 23 A It would be in in the neighbourhood of 30,
24 30 plus.
- 25 Q How many of those were municipal solid

Rough draft

1 waste landfills as opposed to like
2 construction demolition landfills?
3 A I would estimate probably half and half,
4 probably a few more demos. 60, 40,
5 something like that.
6 Q But you may have done as many as 15
7 municipal solid waste landfills?
8 A Yes.
9 [Indiscernible - simultaneous speaking]
10 Q And of those 15 or so, how many of them
11 had visible fire light flames smoke, any
12 of those?
13 A So I would the vast majority of projects
14 like I generally don't get called out on
15 what you would call a surface fire or an
16 active face fire, you know, like people
17 deal with those. The fire department deal
18 with those so I generally get engaged in
19 had subsurface events and then during the
20 attack of those in number of instances we
21 will actually get to the hot area where
22 then once it's exposed to air it lights
23 up and you get lots of smoke and flames
24 until you put it out.
25 Q If you open it?

Rough draft

1 A Yes.

2 Q Do you ever consider not opening it?

3 A I do that as well. It's sort of like each

4 landfill fire is different and I recommend

5 what I feel is the most appropriate

6 strategy to deal with it.

7 Q Are you a fireman?

8 A No.

9 Q For the landfills that have had subsurface

10 reactions and not flames like visible

11 smoke, we've named some of them in going

12 through North American experience.

13 A Mm.

14 Q Are there any that haven't been named yet

15 that involved subsurface reactions that

16 today you believe were heat generating

17 chemical reactions?

18 A In terms of my personal or --

19 Q Yours.

20 A No, the only two that I'm aware of is this

21 Bridgeton thing and the winnipeg one that

22 I worked on.

23 Q As part of your assignment the for

24 Bridgeton you were asked to see to figure

25 out if it caused this?

Rough draft

1 A Correct.

2 Q I assume as part of your work on that you
3 or someone on your staff conducted a
4 literature review?

5 A Yes.

6 Q And to the extent the literature review
7 produced relevant writings that you
8 thought was important you identified those
9 as references in your report?

10 A Yes.

11 Q Did you find any literature references
12 that predicted an event of the daily and
13 nature of a Bridgeton?

14 A No.

15 Q And that's entirely apart from the low
16 level radiological waste just for the
17 reaction itself, that's true, correct?

18 A Yes.

19 Q Now, did you look into information about,
20 if you will, case studies of other
21 landfills that have had below ground heat
22 events?

23 A I have in the past read some information
24 on both the County-wide fire and that's
25 basically the limits of what I've

Rough draft

1 encountered on subsurface reaction.
2 Q And you know that county wide wasn't a
3 fire. It was an aluminum dross reaction?
4 A Basically that's what was concluded. In
5 the what we're seeing in Bridgeton I'm not
6 100 percent sure that it's purely an
7 aluminum dross (phonetic) / (or whether it
8 converted to a SSSER as a result of that
9 initial trigger. Spelling
10 Q And when you say aluminum dross, you're
11 not limiting yourself to that specific
12 metal, are you?
13 A No.
14 Q There are lots of metal oxides?
15 A Yes.
16 Q Dr. Grace described certain reactions that
17 occur in the presence of palladium?
18 A Yes.
19 Q There can be other chemical reactions that
20 can be catalyzed by especially contact
21 between liquid such as water and other
22 metal oxide compounds?
23 A Yes.
24 Q Did you do anything to evaluate the
25 special waste receipt records at Bridgeton

Rough draft

1 Landfill to see if you could find one or a
2 group of candidate catalysts among the
3 waste that had been received by the
4 landfill with the approval of the
5 department of natural resources?

6 A No.

7 Q If you were as opposed to for the purposes
8 of rendering an opinion, one of the things
9 you would look for is aluminum oxide
10 waste?

11 A Yes.

12 Q You would probably look like red iron
13 oxide waste, wouldn't you?

14 A I'm not aware of the characteristics
15 whether red iron objectioned waste goes
16 exothermic on hydration. It sounds like
17 it might.

18 Q Rather than ask you rather than rely on me
19 for anything, you would consult Dr. Grace
20 to get a list of things to look for and
21 take a look?

22 A Definitely when you're looking at adding
23 hydrating materials knowing you have
24 reactive substances that's an important
25 consideration to look at.

Rough draft

1 Q Do you simply know it to be true as a fact
2 that -- strike that.

3 Let's talk about what special wastes
4 are. Is that term used in Canada at all?

5 A It is. I'm not sure if it has a
6 connotation as in the U.S.

7 Q There's municipal solid waste which
8 require no special approvals?

9 A Yes.

10 Q It consists of what businesses throw away.
11 It's not an industrial process waste.

12 A Yes.

13 Q And then there are special wastes which
14 are industrial process wastes and
15 specially things like tires and regulated
16 soils and then there are hazardous wastes?

17 A Yes.

18 Q Is that the structure here, too?

19 A Similar, yes.

20 Q And did you know that every special waste
21 ever disposed of in the South Quarry of
22 Bridgeton Landfill received the specific
23 written approval of the Missouri
24 Department of Natural Resources?

25 A That doesn't surprise me. That's what

Rough draft

1 landfills typically are required to do
2 when they receive what we call special
3 waste, yes.

4 Q Do you participate in your capacity with
5 Sperling Hansen occasionally in securing
6 special waste approvals?

7 A I am from time to time asked by my clients
8 whether they can receive particularly
9 contaminated soils sometimes asbestos
10 materials how they should be handled.

11 Q And there's a regulatory process by which
12 if appropriate samples of something are
13 taken and analyzed, information is
14 reported. The creator or generator of the
15 waste certifies that what's being tested
16 is representative and then information is
17 provided to an agency for approval?

18 A Yes.

19 Q And there are some exclusions. There are
20 some things which by their characteristics
21 are deemed so inappropriate for landfill
22 disposal that they are categorically
23 refused?

24 A Yes.

25 Q In the United States there was a period of

Rough draft

1 time when EPA started to require people
2 who had underground storage tanks
3 containing petro chemical products to test
4 them to see if they were leaking or not.

5 A M'hmm.

6 Q Are you familiar with that generally?

7 A I have a general recollection of that
8 happening.

9 Q was there a similar UST program in Canada?

10 A There definitely was and it's I think in a
11 provincial level and we have, like, a new
12 contaminant soil regulations and --

13 Q was it behind the time curve from the U.S.
14 a few years?

15 A I believe in this general my experience
16 has been that Canadian regulations tend to
17 lag behind U.S. regulations by some period
18 of time.

19 Q A generation?

20 A No, I wouldn't say that much. In the
21 context of, for example, subtitle D,
22 sometime I believe in the early or late
23 80s and we were into early 1990s so maybe
24 five years.

25 Q And so when the province required testing

Rough draft

1 for leaking underground storage tanks, was
2 there a similar phenomenon here where a
3 lot of them were leaking?
4 A Sorry, I didn't hear that.
5 Q When the province required -- we've got a
6 siren.
7 A Yeah.
8 Q When the province required leak testing
9 for underground storage tanks, was the
10 discovery that there were quite a number
11 that were leaking?
12 A Yes.
13 Q And and that generally required pulling
14 them out, replacing equipment, digging out
15 contaminated soil --
16 A Yes.
17 Q And disposing of it?
18 A Yes.
19 Q And that's what you're talking about
20 disposing of --
21 A Yes.
22 Q So it might be impacted by glean or diesel
23 or maybe oil and sometimes antifreeze?
24 A Yes.
25 Q And is that material permitted for

Rough draft

1 landfill disposal here in Canada?
2 A I believe up to certain concentrations and
3 in British Columbia in this our
4 jurisdiction that a lot of individual
5 landfills will limit the levels of the
6 hydrocarbon contamination than what the
7 provincial status require.
8 Q Sure. The laws require one things and
9 landfills require different requirements?
10 A Yes.
11 Q If P they choose to.
12 A Yes.
13 Q Now, you made some statements in your
14 report and I want to make sure where they
15 came from one is that you believe that
16 Bridgeton Landfill and I assume you're
17 talking about the South Quarry but maybe
18 not, contained some significant amount of
19 gypsum?
20 A Again I don't recollect exactly where I
21 picked up the information but that was one
22 of the materials that was received.
23 Q That was going to be my question. There
24 are a lot of statements in your report
25 that have no references and I'm going to

Rough draft

1 try to pick out the ones I care about and
2 ask.

3 A Yes in the way I my review and new to this
4 sort of the process of, you know, what's
5 required in terms of referencing
6 information, so if I didn't do a good
7 enough job, the reason is I'm uneducated
8 in what's needed.

9 Q Your report does not suffer from excess
10 brevity. And I was just being funny?

11 A I appreciate that.

12 Q Let me -- it certainly is lengthy, but let
13 me ask you about one specific number you
14 threw out in your report and that is the
15 notion that Bridgeton Landfill received
16 500,000 used waste tires. What's the
17 significance of that?

18 A That one I do know. That one came from
19 Brenda Audrey told me about when we were
20 on site.

21 Q She was your source for several things?

22 A She seems to be a wealth of knowledge in
23 terms of what happened at the site, yes.

24 Q So you assumed that because Brenda Audrey
25 (phonetic) told you / (that the that it

Rough draft

1 received?

2 A I generally place a lot of trust in
3 regulators because I found them to be
4 credible over many years of experience, so
5 I did not even couldn't separate that I
6 would be told something that wasn't
7 factual.

8 Q And I'm not suggesting that you were or
9 anything but I'm trying to --
10 [Indiscernible - simultaneous speaking]

11 A Yes.

12 Q
13 [Indiscernible - simultaneous speaking] as
14 a fact without a reference to it

15 A Yes.

16 Q Another thing that you got from Brenda
17 Audrey was information about the visual
18 characterization of some drill cuttings?

19 A Yes.

20 Q And what is it that Brenda Audrey told you
21 about seeing some drill cuttings?

22 A This originated from my concern whether
23 there was indeed tar and char and material
24 and so I questioned Brenda about the
25 nature of what she saw while she was on

Rough draft

1 site and was informed that it's basically
2 black material usually very wet and have
3 the appearance of an ash or cement.

4 Q She said the word ash?

5 A That's my recollection, yes.

6 Q Have you seen any boring logs for any of
7 the drillings that have occurred at the
8 landfill?

9 A No.

10 Q Reminded me something I meant to tie up
11 earlier and completely blew off because I
12 got interested in something else. When we
13 talked earlier about the location of the
14 gas interceptor wells where they were
15 constructed relative to the reaction and
16 you gave me the notion that it might have
17 been better to put them closer to the
18 reaction so that they wouldn't pull heat
19 away from the reaction to the well --

20 A M'hmm many.

21 Q You know what I'm talking about?

22 A Yes.

23 Q Do you know what design considerations
24 mitigated not simply not drilling down
25 into the reaction?

Rough draft

1 A I do not. I can anticipate there was some
2 there would be some challenges in doing
3 that.

4 Q One challenge is simply depth. What kind
5 of depth can you get with that sort of a
6 drill rig?

7 A This is the bucket auger drill rig you're
8 talking about.

9 Q Any drill rig that would create an
10 intercept well?

11 A I would anticipate that you could -- I
12 actually shouldn't answer because I don't
13 know the limitations of those -- I know at
14 Vancouver landfill we drilled up to about
15 100 feet and I imagine they can go deeper
16 but I don't know.

17 Q How deep is the reaction in the soccer on
18 Bridgeton Landfill?

19 A /(.

20 A I would have to look in the report you,
21 but I think it's down to possibly 150 feet
22 is my reaction but maybe deeper.

23 Q Below the surface?

24 A Yes.

25 Q And the below ground surface?

Rough draft

1 A Yes.

2 Q And a way it is to look at a graph from a
3 TMP?

4 A where the TMP is available, yes.

5 Q And the way that the graphs work
6 essentially is that there is depth on one
7 axis and temperature on the other axis and
8 then the graph is temperature at depth?

9 A Yes.

10 Q And the nature of each of these curves is
11 to kind of poke out to the right and then
12 come back in in?

13 A Yes, and I believe if it would be
14 convenient to look at one, there would be
15 one in my report.

16 Q That would be great and make sure we're
17 talking in the same way and expressing it
18 simply.

19 A I'm pretty sure it's the -- that's the
20 one, Figure 2-10.

21 MR. BECK: Can you give me the page.

22 MS. WHIPPLE: Page 21.

23 MR. BECK: Thank you.

24 Q All right. And that illustrates the
25 phenomenon that I described where there is

♀

Rough draft

- 1 a lower temperature at the shallower
2 depth, a higher temperature in the middle
3 /C /C and /C /C /C?
- 4 A Yes.
- 5 Q And the way you figure at the heart of the
6 reaction is at a simpler date the greatest
7 temperature is?
- 8 A Correct.
- 9 Q And so the greatest temperature in this
10 particular TMP 7R and on the data
11 collection date that goes furthest to the
12 right, so to the highest temperature, that
13 is just above 350 feet above mean sea
14 level I'm sorry, above 380 feet?
- 15 A I'm seeing a peak right at 380.
- 16 Q Okay.
- 17 A And it's kind of hard with the color
18 similarity to determine what date that is
19 but we can probably figure it out.
- 20 Q And this particular temperature monitoring
21 probe has had periods of time, dates of
22 readings with higher temperatures and
23 dates of readings with more moderate
24 temperatures?
- 25 A I believe the highest was something like

Rough draft

1 310 degrees Fahrenheit.
2 Q And so the ground surface is reflected by
3 the top line of the graph, correct?
4 A I believe that's the shallowest TMP the
5 ground surface. I suspect it's at the
6 zero depth level. So it's like, just to
7 be clear, the ground elevation here looks
8 like something like 505 feet.
9 Q All right. And then the device itself
10 that goes down into the drill hole is
11 called what?
12 A I call a /TH*ERPL, people use different
13 temperature probe. Spelling
14 Q And is it simply a device that permits at
15 stated intervals the taking of the
16 temperature inside the hole?
17 A Yes, usually they're sort of just
18 temperature responsive pieces of or
19 sensors yeah, they're typically here
20 they're installed every 20 or 40 feet in
21 the hole.
22 Q And unlike a gas extraction well which
23 pulls gas from a larger area and then
24 averages the temperature automatically by
25 mixing it up --

Rough draft

1 A Yes.

2 Q This actually measures the temperature
3 right at the place where the probe is?

4 A Correct.

5 Q And so this is much more a direct
6 temperature measurement?

7 A Yes.

8 Q And you don't have a TMP every 2 feet so
9 you don't know every temperature, but
10 within the area it covers, it is the
11 information you have about the subsurface
12 temperatures and --

13 [indiscernible - simultaneous speaking]

14 THE VIDEOGRAPHER: Going off record, this is the
15 end of media Unit Number 3. The time is
16 3:15. .

17 (PROCEEDINGS RECESSED AT P.M.)

18 (PROCEEDINGS RESUMED AT P.M.)

19 THE VIDEOGRAPHER: We're back on the record. Here
20 begins media unit number 4 in the
21 deposition of Tony Sperling. The time is
22 3:35.

23 MR. BECK:

24 Q Dr. Sperling, after the break are you
25 ready to continue?

Rough draft

1 A On the homestretch for today. I'm looking
2 forward to it.

3 Q Tore today.

4 Q Could I ask you to look at Exhibit Number
5 5 which is this --

6 A Yes, I have it here.

7 Q Do you see where on the left side of this
8 figure in the South Quarry there's a green
9 area with an indication approximate extent
10 of settlement front as of July, 2015?

11 A Yes, I do.

12 Q And do you have any particular reason to
13 disagree with that depiction of the
14 location of the approximate extent of the
15 settlement front that's around the time
16 you showed up?

17 A Yeah, I would totally agree with you
18 that's kind of the area where that was the
19 most odor and appeared to be, you know,
20 some elevated temperatures and with
21 respect to the top topography as well so I
22 would agree with it.

23 Q And do you notice a cross-section line
24 that cuts across the landfill?

25 A Yes, I noticed that before.

Rough draft

1 Q And if you take the place where
2 approximate end of the settlement front
3 which is station 200?

4 A Yes.

5 Q And then follow that to the nearest
6 portion of the westlake OU-11 area 1 site
7 which is not quite 2700?

8 A Correct, yeah.

9 Q Then assuming the scale was accurately
10 drawn, the distance between settlement
11 front to the nearest rads is nearly half a
12 mile, isn't it?

13 MS. WHIPPLE: Objection to the form. States
14 facts contrary to evidence.

15 MR. BECK: No, it doesn't.

16 THE WITNESS:

17 A Yeah, I just have to do a little mental
18 because.

19 MR. BECK:

20 Q 2700 feet minus 200? [Indiscernible -
21 simultaneous speaking]

22 A 2500 feet, roughly half a mile, yes.

23 Q When you wrote the entries in your report
24 referring to the time frame three to six
25 months, that was actually based on a

Rough draft

1 distance of approximately 900 feet?
2 A In that 900 to a thousand, yes, from neck.
3 Q Yes. Now, have you been provided the
4 testimony of any Missouri Department of
5 Natural Resources engineers to review that
6 as part of your preparation?
7 A No.
8 Q I'm going to refer to a man named J.R
9 Boessen, Boessen. Have you read his
10 deposition amongst the depositions you
11 were given?
12 A No, sir.
13 Q I should have done this during the break.
14 what is in and we can go off the record
15 for many?
16 THE VIDEOGRAPHER: Going off record. The time is
17 3:38.
18 (Discussion off the record) Boessen
19 Boessen test test
20 THE VIDEOGRAPHER: Back on the record. The time
21 is 3:42.
22 MR. BECK:
23 Q Dr. Sperling, first of all, to correct
24 what I said, the gentleman's name is J.P.
25 Boessen.

Rough draft

1 A Okay.
2 Q He is an engineer with the Missouri
3 Department of Natural Resources. His
4 deposition was taken by my partner Peter
5 Daniel on September 17th and we've cut a
6 clip of just a little over four minutes
7 that I would like you to ask and ask you
8 some questions?
9 A Okay.
10 Q All right so in 2004 you joined the State
11 of Missouri was that with the Department
12 of Natural Resources?
13 A Yes.
14 Q And you've been with the solid waste
15 program the entire time you've been
16 employed with the state?
17 A Yes.
18 Q Is your title still engineer 1?
19 A Engineer 2.
20 Q What's the difference between an engineer
21 1 and an engineer 2?
22 A How long you've been there.
23 Q Have you reviewed plans to make
24 representations to people within the
25 department of solid waste management?

Rough draft

- 1 A Yes.
- 2 Q And you did that as an engineer for
3 department of Missouri Department of
4 Natural Resources?
- 5 A Yes.
- 6 Q Who is making the engineering decisions in
7 the solid waste management?
- 8 A Charlene.
- 9 Q Is the subsurface reaction moving away
10 from the neck now?
- 11 A Moving away? Yes.
- 12 Q The indicators that you have that the
13 subsurface reaction is moving away from
14 the area of the neck include gas
15 temperature readings, correct?
- 16 A Yes.
- 17 Q And another indicator that you have that
18 the subsurface reaction is moving away
19 from the neck in addition to the gas
20 temperatures is the areas of subsidence?
- 21 A Subsidence has slowed down.
- 22 Q So to go back to it with respect to gas
23 temperature what you've observed is gas
24 temperatures in the area of the neck are
25 decreasing, correct?

Rough draft

- 1 A Some places, some places rising, yeah.
2 They're remaining stable.
- 3 Q And with respect to subsidence, what
4 you've observed is that any subsidence in
5 the area of the neck has slowed, correct?
- 6 A Correct.
- 7 Q And subsidence in areas away from the neck
8 has, in fact, increased?
- 9 A Certain places.
- 10 Q And that's a further indicator that the
11 subsurface reaction is moving away from
12 the neck, correct?
- 13 A The front is moving away from the neck.
- 14 Q Are you aware as an engineer in the solid
15 waste management program of any indication
16 the subsidence front is moving towards the
17 neck?
- 18 A No.
- 19 Q Is it true that the SSR, the subsurface
20 heating front is moving away from the neck
21 area between the two quarries?
- 22 A Yes.
- 23 Q Are the temperatures in the area of the
24 neck as high as they are in the
25 temperatures where the heating front is

Rough draft

1 presently located?

2 A No.

3 Q Are the temperatures lower in the area of
4 the neck than they are in the area of the
5 heating front?

6 A Yes.

7 Q Has the trend for the last several months
8 with respect to the heating front been
9 away from the area of the neck?

10 A The heating front would be from the neck,
11 yes.

12 Q Yes, and the subsidence issues in the last
13 several months have been moving away from
14 the area of the neck, correct?

15 A Yes.

16 Q All of the measurements and data that you
17 have been exposed to indicate that the
18 heating front of the subsurface reaction
19 is moving away from the area of the neck
20 and not toward the area of the neck, is
21 that true?

22 A Yes.

23 MS. WHIPPLE: Is that the end of the clip?

24 MR. BECK: It is.

25 MS. WHIPPLE: I will ask then are you going to

Rough draft

1 play while I understand was the brief
2 re-direct so that the rule of completeness
3 is so before you ask the witness.

4 MR. BECK: The rule of completeness doesn't
5 require that and I'm not going to play
6 anything but you're welcome to play
7 anything as part of your.

8 MS. WHIPPLE: Of course I don't have it with me
9 so I'll just lodge an objection that this
10 witness was redirected his testimony was
11 clarified and if we were in a courtroom
12 you wouldn't be able to hand select this
13 one designation without my cross
14 designation.

15 MR. BECK: That's a speaking objection.

16 MS. WHIPPLE: Yes, it is.

17 MR. BECK: Improper because you're communicating
18 with the witness and not the Court.

19 MS. WHIPPLE: Well I can't communicate with the
20 Court today and if you told me you were
21 going to do a designated piece of the
22 video I would have brought a counter.

23 MR. BECK: No one does that during
24 cross-examination.

25 MS. WHIPPLE: N problem then. I'll just lodge the

Rough draft

1 objection. Of course you can ask the
2 question and that's your water.

3 THE WITNESS: Thank you.

4 MR. BECK:

5 Q Dr. Sperling, did you acquire a good
6 understanding of what Mr. Boessen was
7 saying?

8 A Yes.

9 Q And do you agree with it?

10 A In the general big picture analysis, yes.

11 Q And you understood that when he was saying
12 moving away from the neck, he was
13 referring to away from the neck within the
14 South Quarry?

15 A Yes.

16 Q So moving essentially to the south?

17 A Yes.

18 Q Could I ask you to take another look at
19 Exhibit 5 and, again, I will pull up my
20 copy to make it larger if you would like.
21 I'm happy to do that. You see down here?

22 A Okay.

23 Q -- and at 7R which is very close to the
24 right hand lobe of the blue thing?

25 A I have a general recollection of where 7R

Rough draft

1 is. Somewhere in there (witness
2 indicates).

3 Q So my question is: That is the same
4 temperature monitoring probe that we
5 looked at a graph of from your report?

6 A Yes.

7 Q And what we discovered in looking at your
8 graph in your report is that the heart of
9 the reaction at that point when it was
10 measured affecting that TMP has been
11 approximately 150 feet below ground
12 surface?

13 A Many had many.

14 Q Yes?

15 A Yeah, I'm seeing it at the greatest depth.
16 I would say the heart of it is probably
17 100 feet below surface.

18 Q Okay. And have you done anything to
19 identify during this same time period for
20 which those TMP readings are present what
21 the water table was in that section of the
22 South Quarry at the time those
23 measurements were taken?

24 A No, I was not aware of water level data
25 that -- I did not encounter any -- that's

Rough draft

1 another thing I really asked for that I
2 was hoping, you know, I did not know there
3 was stuff available from the GIWs or the
4 TMPs.

5 Q And just to make sure that no one is
6 misled by the phrased asked for, you're
7 not saying you asked me you're talking
8 about the Attorney General's office?

9 A Basically I made the recommendation that
10 those piezometric levels be taken because
11 my impression was that the only readings
12 that were being taken were from active gas
13 wells. If there is, in fact, static wells
14 or piezometers are being read, that's
15 great. I would like to see that
16 information and get a good idead of where
17 the water level is in the neck.

18 Q Can I ask you in the just happen to know
19 when those what the water table was
20 relative to groundwater to the South
21 Quarry?

22 A Well, I have all all I have is that one
23 map from Aquaterra 2010 work which
24 suggests, you know, that the levels are
25 somewhere around 440, 430 in general and

Rough draft

1 then there are these massive depressions
2 around some of the ground water sumps.
3 Q And do you know where the nearest leachate
4 sump is that has operated during the time
5 frame when the TMP has been in place?
6 A No, my observations are only from that
7 2010 level. I don't know if that sump had
8 been de-commissioned in the interim or
9 not.
10 Q Now, let me ask you to turn in your report
11 which is Exhibit 1, please, to the page,
12 it's actually page 14 but it's not
13 numbered?
14 A Right.
15 Q And it's Figure 2-6.
16 A Okay, I'm looking at it.
17 Q Figure 2-6 is, again, your company taking
18 a pre-existing drawing --
19 A Yes.
20 Q And using it to depict something. In this
21 case it's being used to depict what burns
22 and Mcdone engineering /C /C identified
23 among other things the water table in
24 1985?
25 A Correct.

Rough draft

1 Q And the water table then in the South
2 Quarry was approximately what?
3 A I'm just -- it's somewhat undefined.
4 Basically looks like 250 feet.
5 Q Pardon me?
6 A You asked what the water table is in the
7 South Quarry and as far as I can tell it's
8 at the bottom of the quarry at 250 feet.
9 Q Where is that?
10 A Right here (witness indicates) at the
11 bottom of the quarry.
12 Q You're talking about the right the
13 westlake quarry?
14 A Correct, yeah. I believe that's in my
15 understanding of this drawing, that is the
16 Bridgeton Quarry.
17 Q And what makes you think that burns and
18 Mcdon intended to depict the absence of
19 any water in the South Quarry in this --
20 there was noise in the next room?
21 A I am not sure why they did not depict
22 because my understanding is that
23 landfilling I suspect is they had no data
24 as to what the water levels or waste
25 levels in the quarry were.

Rough draft

1 Q So you're not saying that shows that
2 there's a water table at 250. That
3 wouldn't make any sense, would it?

4 A It makes perfect sense to me. I don't
5 understand where you're going.

6 Q Okay. Look at Figure 2A.

7 A 2-8?

8 Q Yes, sir.

9 A

10 Q 2-8 depicts the South Quarry on the left,
11 correct?

12 A

13 MS. WHIPPLE: Figure 2-8.

14 THE WITNESS: Oh, sorry I'm looking at Figure 2-7.

15 MR. BECK:

16 Q Figure 2-8 depicts the south as well as
17 the North Quarry?

18 A Correct.

19 Q And in the South Quarry it shows water
20 table contours in the waste throughout the
21 South Quarry based on sounding the wells?

22 A Yes.

23 Q And can you explain for people who aren't
24 familiar with the term sounding what that
25 refers to?

Rough draft

1 A Basically it represents lowering a little
2 sensor a conductivity until it beeps and
3 when it strikes the water table it
4 typically gives a little beep and you can
5 measure the depth of the water.

6 Q I may have to below your report up to get
7 to figure to show you the contours, but
8 can you tell in the approximate location
9 of where TMRP is today what the water
10 level was at the time the landfill was
11 sounded in 2010 by Aquaterra?

12 A Yeah, maybe it would be useful to put a
13 little dot on the map here to try and
14 figure out exactly.

15 Q And if you would like to identify 7 and
16 then put a dot on the map, that would be
17 great. Do you have a pen or do you want
18 to use mine?

19 A TMP 7R if we're in agreement, I'm kind of
20 projecting roughly where my little X is.

21 Q It's easier than that. We're going to
22 agree that you get to make the decision
23 where it is. Let me blow up the report
24 and see if that helps you get the
25 contours.

Rough draft

1 Let me show you on my laptop since I
2 can't get it on my iPad and blow it up to
3 a larger size, unless you can see a
4 contour without me doing that?
5 A Oh, it's really hard. I think I need a
6 magnifying glass to be certain what those
7 numbers are. Yeah, they're.
8 Q Okay.
9 A I wouldn't be confident in interpreting
10 those numbers.
11 Q Here it is. Dr. Sperling, you're looking
12 at my blowup of that map. Can you
13 determine the approximate contour?
14 A Yeah, as far as I can judge, my estimation
15 is somewhere around 420, 425.
16 Q Okay. And so based on the soundings that
17 you knew of that were done in in 2010 by
18 Aquaterra, the location of the reaction at
19 temperature monitoring probe 7R is
20 approximately 70 feet below the water
21 table?
22 A That was reported in 2010, yes.
23 Q Yes.
24 A Yeah. If I may just return back to that
25 concurrently to that figure what the with

Rough draft

1 with the temperature probe Peggy maybe you
2 can help me what the number was.

3 MR. BECK: I think it's just a few pages earlier
4 in the report. It's 2-6.

5 THE WITNESS: No, 2-10.

6 MS. WHIPPLE: 2-10 go the other way.

7 THE WITNESS: Yeah, because ...

8 MR. BECK:

9 Q And to expand upon my question I'll ask
10 you to simply confirm that the heart of
11 the reaction at every temperature
12 monitoring probe 7R reading from November
13 of 2012 through February of 2014 is below
14 that water table line?

15 A Sorry, you're suggesting something that I
16 cannot in my understanding of physical
17 prof. accepts as an engineer and if you
18 would like me to clarify why I think that
19 I'll be happy to do so.

20 Q I would just like you to tell me the thing
21 that I accept that you can't. I'm not
22 asking I want to know what it is that you
23 can't accept?

24 A Basically that the reaction is occurring
25 below the water table.

Rough draft

1 Q Okay. what you're saying is you don't
2 think that can be a good comparison
3 because in your notion the reaction can't
4 be occurring below the water table and I'm
5 saying based on all of the data, the
6 reaction is and always was occurring below
7 the water table and we have that
8 disagreement, right?

9 A Yes, and I'm not sure exactly what the
10 name of the proper scientific process
11 would be, but basically it's some law of
12 thermal dynamics that water, unless it's
13 super heated in some way, you know, cannot
14 exist in a liquid phase below the boiling
15 point.

16 Q That's where we're disagreeing?

17 A Yes.

18 Q Okay. Let me help with you that.
19 Disagreeing. The boiling point of water
20 is 212 degrees Fahrenheit at standard
21 temperature and pressure?

22 A Yes.

23 Q At greater than standard pressure the
24 boiling point of water is greater than 212
25 degrees, correct?

Rough draft

- 1 A I would have to look that up, but I do
2 know it changes.
- 3 Q Do you know that the waste column and a
4 saturated water column within that waste
5 cause downward pressure?
- 6 A As in the south weight of the mass, yes.
- 7 Q And have you made any calculation to see
8 how much above 212 degrees Fahrenheit that
9 means the boiling point of water would be
10 under 100 feet of it?
- 11 A No.
- 12 Q Okay. And so the reason that you can't
13 accept as a possibility that the reaction
14 started, continued and is still occurring
15 under the water table is because there are
16 temperatures greater than 212 degrees and
17 you haven't done any calculation of
18 whether above standard temperature and
19 pressure the boiling point of water is
20 greater than 212 degrees?
- 21 A Yes.
- 22 Q Do you know of anyone that you have
23 consulted who is capable of looking up or
24 calculating the change in the boiling
25 point of water that would occur under that

Rough draft

- 1 massive amount of wet waste?
- 2 A I would have to think about that,
3 whether -- I think the weight of the waste
4 mass is totally has no effect on the
5 hydraulic pressure within the fluid, that
6 it's only the water column from the water
7 table down to whatever level once I know
8 what that water level is then we can make
9 that calculation but it's definitely not
10 from the level surface down to the --
- 11 Q It's certainly the level from the water
12 table down?
- 13 A Yes, absolutely. The weight of the water
14 from the water table down would be the
15 appropriate thing to take into
16 consideration.
- 17 Q At least, but there's also garbage in the
18 landfill, right?
- 19 A Yes.
- 20 Q The garbage is so compacted that you
21 expressed the value in your report that it
22 may be as dense as one times 10 to the
23 minus 9?
- 24 A Yes but.
- 25 Q which is tighter than the tightest clay

Rough draft

1 across the countryside, right?
2 A Many had many.
3 Q Yes?
4 A Yes.
5 Q Highly impermeable to water, yes?
6 A Possibly, yes, could be.
7 Q And let's just carry the thermal dynamic
8 disagreement to its ultimate effect. If
9 this reaction started under water, below
10 the water table, then it no longer is
11 possible that the reaction is the result
12 of oxygen intrusion, correct?
13 A If the reaction started below the water
14 table, yes, I would say that.
15 Q And so we've got a really important
16 question to answer here, don't we, which
17 is where is the water table relative to
18 the reaction?
19 A Absolutely.
20 Q And if we find the water table is above
21 the reaction, then you're going to have to
22 go back to the drawing board on what
23 caused all of this to happen, right?
24 A I would say I would want to think about
25 it. Yeah, that's not something that I

Rough draft

1 would want to make a snap judgment on, you
2 know, around this table.

3 Q And what I'm referring to is your
4 explanation in this creation of steps 1,
5 2, 3, 4 and 5 we're talking about
6 interrupting the first steps of that and
7 essentially completely undoing your theory
8 that this is oxygen intrusion?

9 A well, the point that I would make is that
10 of the wells that I sort of identified
11 as possible initiators of and actors of
12 extracted gas and you mentioned yourself
13 if wells were flooded that they cannot be
14 drawn upon and certainly those wells were
15 being actively extracted so I would
16 conclude that the water table had to be
17 below at least somewhere below the screen
18 level of those wells.

19 Q That's a little different than the prior
20 discussion we had, Dr. Sperling. What we
21 discussed was if the perforated interval
22 of a well's piping is blocked with water
23 so that you can't get gas out of the
24 landfill you can still get gas two ways.
25 One is atmospheric area and the second is

Rough draft

1 gas from the header pipe system that
2 originated at other wells. You can get
3 both of those, right?
4 A Yes, but you would not get any significant
5 flows, you know, as were I believe
6 indicated in the data set.
7 Q How? How is that indicated in the data
8 set?
9 A I believe in the pressure readings, but
10 that is something I definitely will want
11 to explore with Dr. Abedini.
12 Q Let me just stick with a more conceptual
13 question for you and see if I understand
14 what you're basing your opinions on and
15 that is: When you said in your report
16 that well 67 had temperature and carbon
17 monoxide and then they increased the
18 vacuum pressure on the well, where did you
19 look to find the fact that they increased
20 the vacuum pressure on the well?
21 A Basically in the logs, the graphs of the
22 vacuum pressure on the well.
23 Q So what you're referring to is the
24 pressure readings that were taken at the
25 wellhead?

Rough draft

1 A In the database.
2 Q And reported in the SCS database?
3 A Yes, that's what I was basing all my
4 interpretations on.
5 Q And as respects well 67 which is the place
6 you say this this all started, then I
7 should go ask Dr. Abedini where he got the
8 values that he graphed because you only
9 worked from the graph?
10 A Correct.
11 Q So one thing I think we should clear up if
12 it's not crystal clear, maybe it's not,
13 but it should be. What's happening at
14 Bridgeton Landfill today what you call an
15 a subsurface self-sustaining exothermic
16 reaction is a chemical reaction which is
17 not a fire, true?
18 MS. WHIPPLE: Objection. Misstates the witness's
19 report.
20 MR. BECK:
21 Q Isn't that true?
22 THE WITNESS:
23 A I would say if I define fire as a rapid
24 oxidation of waste mass or other material
25 then correct, yeah, I'm seeing something

Rough draft

1 different here for the most part, yes.

2 MR. BECK:

3 Q And that is part of the typical definition
4 of what a fire is, right?

5 A Yes, flames and oxidation.

6 Q Sure. Now, one of the concepts that you
7 discuss in your report on a couple of
8 occasions is the concept of char, char.

9 A Yes.

10 Q which is somewhat similar to charcoal,
11 correct?

12 A Yes, correct.

13 Q And you actually have a picture of some
14 glowing char?

15 A Yes.

16 Q -- but just to be very clear about it,
17 that's a picture from some other place?

18 A Yes.

19 Q Not Bridgeton Landfill?

20 A Correct.

21 Q Do you have any pictures of any glowing
22 char at Bridgeton Landfill?

23 A No, sir.

24 Q Has anyone told you that they've seen any
25 glowing char at Bridgeton Landfill?

♀

Rough draft

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Rough draft

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12 Q And I'm not suggesting anyone was doing.
13 Usually when I print e-mails it's got more
14 information than that. But simple
15 question: Is there any time any place at
16 Bridgeton Landfill either in gas or in the
17 waste mass itself at a temperature
18 monitoring probe where anyone has ever
19 measured a temperature as high as 400
20 degrees?

21 A Not that I'm aware. I believe the highest
22 number I've come across was that
23 temperature of probe 7R at 310 Fahrenheit.

24 Q Do you recall that in your report which is
25 Exhibit 1 you made reference to a certain

Rough draft

1 dirigible known as the Hindenburg?
2 A Yes, sir.
3 Q whose turn of phrase was that?
4 A In terms of /C --
5 Q who decided to write the word Hindenburg
6 on the page?
7 A Me.
8 Q Did anyone talk to you about it ever?
9 A No.
10 Q And the suggestion that you were or the
11 implication that you were intending to
12 leave was that there was a risk of Monday
13 spontaneous ignition to hydrogen?
14 A Yes, when I saw the pictures that were
15 provided by Ms. Audrey of the huge gas
16 bubbles that were on the site and knowing
17 that the gas was up to 30 percent
18 hydrogen, I was extremely concerned
19 because we have had similar, you know,
20 methane bubbles develop on landfill
21 closure projects and I'm always extremely
22 worried that when we have to de-inflate
23 those bubbles that there's a risk of
24 explosion and I tried to graphically flag
25 that risk.

Rough draft

1 Q You might have been a little extra graphic
2 and I want to make sure we know what you
3 meant by it.

4 A Yes.

5 Q In order to -- a risk of methane is
6 because it is a combustible gas that in a
7 mixture of methane and air generally in a
8 confined space that is neither too rich
9 nor too lean and in the presence of a mode
10 of ignition methane has blown up?

11 A M'hmm.

12 Q It could blow up in a manhole or a
13 basement or another confined space?

14 A Yes.

15 Q And this is the reason why we're so
16 concerned about methane migration at the
17 landfill that if it is above even half of
18 the lower limit that can be ignited we say
19 you've got to put a stop to that?

20 A Yes.

21 Q And I know there are theories floating
22 around this case that actions taken to
23 stop the migration away from Bridgeton
24 Landfill had consequences that were
25 unexpected and unhelpful, is that fair?

Rough draft

- 1 A Yes.
- 2 Q The idea of controlling the migration of
3 that methane was certainly /HRAUDible,
4 true?
- 5 A Absolutely.
- 6 Q Because when you have migration from of
7 methane from a landfill you are required
8 to take steps to stop it?
- 9 A Yes.
- 10 Q And perimeter extraction is one of the
11 most typical engineering steps to try to
12 control methane migration?
- 13 A One of them, yes.
- 14 Q Another would be simply a tighter well
15 spacing so that the zone of influence of
16 each well overlaps enough that methane
17 goes up, not out?
- 18 A Correct.
- 19 Q So let me just understand the criticism of
20 the control effort, first of all, do you
21 say that the consulting engineering firm
22 that Bridgeton Landfill hired to advise it
23 on the best way to control methane
24 migration was negligently hired because
25 they weren't qualified for that kind of

Rough draft

1 work?

2 A No, I'm not saying that at all.

3 Q Are you saying that Bridgeton Landfill
4 should have rejected the design
5 recommendation of that consulting engineer
6 with respect to the perimeter extraction
7 system?

8 A With respect to the perimeter extraction
9 system are we talking gas extraction wells
10 where these horizontal drain sort of
11 horizons hazard.

12 Q I'm talking about the PEWS and my question
13 was are you saying that when the
14 consulting engineer said here is my plan
15 for addressing methane migration, it
16 includes perimeter extraction wells?

17 A Yes.

18 Q That are intended to capture methane
19 before it leaves your property and gets to
20 somewhere else where it can do mischief?

21 A Yes.

22 Q Are you saying Bridgeton should have said
23 that's a bad plan we shouldn't go with it?

24 A No.

25 Q Are you saying that when the Department of

Rough draft

1 Natural Resources when it approved that
2 plan was negligent?

3 A No.

4 Q Isn't it fair to say that both the
5 Department of Natural Resources and
6 Bridgeton Landfill had the right to rely
7 on that consulting engineer to design a
8 good design that would accomplish the
9 intended purpose without creating
10 unintended consequences?

11 A I would say yes, that sounds reasonable.

12 Q And if in fact your own client hired you
13 to address a methane migration problem you
14 would expect them to rely on your judgment
15 about what is the best professional means
16 of accomplishing it?

17 A Yes.

18 Q And that doesn't make your client
19 negligent. That makes them normal people
20 who hire experts?

21 A Yes.

22 Q Now, I don't understand, I'm not going to
23 make a comment. I'll put it this way:
24 Help me understand, please, how it is that
25 you think an extraction well outside the

Rough draft

1 waste mass could in some way cause oxygen
2 to intrude into the waste mass?

3 A Basically what I'm focused on is the wells
4 inside the waste mass being overdrawn
5 rather than the wells outside the waste
6 mass.

7 Q Okay. And maybe I'm thinking about
8 someone else's criticism more than
9 anything else, but I'm entitled to test it
10 with you.

11 A Yes.

12 Q Can you think of any way that a perimeter
13 extraction well outside the waste mass
14 even if put under more vacuum than someone
15 in hindsight claims was the right amount,
16 could draw oxygen into the waste mass?

17 A I would have to give it some careful
18 consideration because I think it's a
19 three-dimensional -- there's a lot of
20 complexity in the quarry wall and
21 depending if you're pulling deep down, you
22 know, I could see basically going from the
23 waste mass and coming back into the well
24 or something, you know, whenever basically
25 gas will flow from high pressure areas to

Rough draft

1 low pressure areas, right.
2 A Just like water pathway of least
3 resistance high permeability a pathway to
4 do so and so if you're sucking deep in the
5 bedrock there's a possibility that that
6 gas might migrate and could possibly
7 happen.
8 Q That's pretty speculative, isn't it?
9 A I would have to look at the geometry.
10 Q well, let me ask another one: Let's say
11 I've got one that has gas extraction wells
12 in the waste mass?
13 A Yes, sir.
14 Q And that's, I think, what you had interest
15 in and I've got a final cover on this
16 landfill which has been inspected by the
17 Department of Natural Resources and found
18 to comply with the cover construction and
19 design requirements of state law.
20 A M'hmm.
21 Q But, like all landfill covers, it
22 occasionally requires maintenance.
23 A M'hmm.
24 Q There may be erosion or otherwise
25 something that causes a few inches of

Rough draft

1 thinning in a multiple foot cover. Have
2 you done any calculations to explain how
3 that relatively minor thinning of the
4 landfill cover can provide a preferential
5 intrusion pathway for atmospheric oxygen
6 under vacuum inside the waste mass?

7 A Specific calculations, no. From from
8 general knowledge that you overpull gas
9 wells even with covers on them it does
10 happen. And I also from a lot of
11 experience with soil caps have personally
12 witnessed numerous instances where there's
13 fractures through those caps that
14 basically render them totally ineffective
15 and that's why most of our designs are
16 geomembrane caps that we rely on more.

17 Q I hear you but that's a different
18 situation that I spoke to. I didn't speak
19 to a fracture. I spoke to an erosion
20 which robs the cover of a few inches of
21 several feet of its compacted depth and
22 actually not in the compacted part up in
23 the top soil?

24 A Yes.

25 Q Have you done any calculation to show how

Rough draft

1 much overpull there would have to be to
2 cause that difference of a few inches to
3 mean anything to the likelihood of oxygen
4 intrusion?

5 A Yeah, just from a big picture perspective
6 I would say that a scenario like that
7 would have a very minor effect and would
8 not, you know, cause the kind of massive
9 air intrusion that occurs. It's a direct
10 pathway through the cover system.

11 Q what you're thinking pertinent is somewhat
12 large scale cover pretty much down to the
13 waist then that creates a way for air to
14 come in?

15 A Yes, sir.

16 Q You're not aware of any of that from the
17 period of 2008 to the end of 2010, are
18 you?

19 A My recollection of reading some of the
20 inspection reports was there were
21 instances of I believe cracks in had
22 exposed waste, but I would have to go
23 back. I seem to remember hearing and
24 maybe I'm getting mixed up with, you know,
25 different observations at different times.

Rough draft

1 Q The ones you mention in your report is
2 back in had 1992?

3 A Yes.

4 Q while the landfill was still operating
5 there was no final cover: I'm talking
6 about a much later time period. I'm
7 talking about between December of 2008 and
8 December of 2010 do you know of any
9 inspection report which shows such a great
10 defect in the cover that oxygen intrusion
11 could result?

12 A Not to my knowledge.

13 Q Okay.

14 Now, do you know of any effort by
15 Aquaterra in 2010 to obtain a variance, if
16 you will, from oxygen limitations at a
17 leachate collection well? Do you know
18 anything about that?

19 A Not that I'm aware of. And just for the
20 record, on your previous question,
21 something comes to mind that I think I
22 would like to include.

23 Q Please do.

24 A I understand from discussions with and I'm
25 terrible at names. If I may ask Peggy

Rough draft

1 what the other gentleman we called badger.
2 Dr. Stark.

3 Q Badger?

4 A You call him badger. That's his Nick
5 name.

6 Q I want to know why?

7 A You'll have to ask him why.

8 That he encountered areas during his
9 inspections where the cover was fully
10 compromised and waste was fully exposed.

11 Q And I just want to put that in temporal
12 context. You know that after Bridgeton
13 Landfill notified the Missouri Department
14 of Natural Resources and there was a
15 worsening of the situation the department
16 hired two people to be consultants to it
17 one was Todd Thalhamer, the other was Tim
18 stark. Todd Thalhamer wrote a report in
19 2013. Tim stark inspected and wrote
20 inspection reports describing what you're
21 talking about?

22 A Yes.

23 Q So the time frame for that must be
24 post-2012, right?

25 A M'hmm, yes, you would think so.

Rough draft

1 Q And I'm more interested really, it's not
2 irrelevant to me, but I'm more interested
3 right now in had this question of whether
4 there was an oxygen intrusion pathway
5 between December of 2008 and December of
6 2010.

7 A M'hmm.

8 Q And the only one that you're speaking to
9 in your deposition of your report then is
10 too much vacuum on wells which pulled them
11 so hard or you call it overpull that it
12 had the potential to draw atmospheric
13 oxygen into the landfill itself through
14 the cover?

15 A Yes.

16 Q Not through a crack but through the whole
17 cover and get into the waste mass, right?

18 A Yes. Just to correct what my experience,
19 you know, is, that soil covers are never
20 perfect and invariably they're going to
21 have holes in them that are going to allow
22 air intrusion to occur.

23 Q I will probably agree with you that
24 nothing is perfect.

25 A Yes.

Rough draft

1 Q Have you ever seen in your professional
2 life a more impermeable cover over any
3 landfill than the one at Bridgeton over
4 the South Quarry?

5 A Yes.

6 Q where?

7 A I would say heartland landfill, Vancouver
8 landfill. And the reason I say that is
9 that in this instance you have this EVOH
10 geomembrane tap/cap /C spelling /C and in
11 terms of underneath that there is a soil
12 cap which I'm not 100 percent sure of the
13 quality of and so certainly I believe a
14 lot of the geomembrane caps we're putting
15 in are comparable to that level equal it
16 and maybe not better than, but and then in
17 addition to that they will have additional
18 top soil protection in the geomembrane.

19 Q Have you seen the EVOH cap construction
20 plan to see how it was designed?

21 A Only in sort of the conceptual pre-design
22 drawings.

23 Q Do you know that the design and
24 construction of the ethylene vinyl alcohol
25 or EVOH over the South Quarry of the

Rough draft

1 Bridgeton Landfill is actually set up with
2 gas channels underneath and keyed into a
3 trench around the perimeter in order to
4 make it utterly impossible for gas to
5 escape in the absence of a tear in the
6 cover?

7 A Yeah, and that presents me with great
8 concern.

9 Q Okay. Go ahead.

10 A Based on what I observed, you know, during
11 my inspection that there's breaches in
12 the -- in this the toe drain area that
13 allowed air to enter into the gravels
14 beneath the trap and so that would allow
15 that airway pathways into the rest of the
16 landfill, that would be very concerning to
17 me /(.

18 Q How many repairs did you see that needed
19 to be repair on the day of your
20 inspection?

21 A I would say about ten. Of those maybe
22 three were really significant.

23 Q Okay. And of the the three, did you call
24 them to the attention of anyone at the
25 landfill in order to apprise them of your

Rough draft

1 concerns so that they could attend to the
2 necessary maintenance right away?

3 A I was basically attended by their senior
4 engineer and to me it seemed like a total
5 no brainer that he was seeing exactly and
6 was seeing exactly the same things I was
7 seeing.

8 Q And when you say their senior engineer who
9 do you mean?

10 A I believe the gentleman's name was Jim --
11 I don't recollect his.

12 Q Getting?

13 A That rings a bell, yes.

14 Q And at the risk that he might not have
15 been focused on what you were focused on,
16 did you ever say to Jim Getting look at
17 that, that needs to be fixed?

18 A In terms of our discussions, I have no
19 exact recollection of the communication.
20 There was somewhat of a -- I felt a little
21 bit adversarial so there was a tendency
22 not to communication. We were told to
23 essentially, you know, not ask questions,
24 not comment and they were just there to
25 observe what we were doing, so that's what

Rough draft

1 I did.

2 Q And who told you that?

3 A In terms of -- I'm trying to recollect the
4 exact details of how it played out.

5 Q I don't care about that. I'm I just care
6 if the instructions came from the Attorney
7 General's office.

8 A No, I do not believe that. I believe it
9 came from the staff or sort of initiated
10 with, you know, of taking pictures and
11 then when I asked questions I was told,
12 you know, like we're just here to observe
13 and not communicate and so I kind of shut
14 my mouth and --

15 Q Did you ask the Attorney General's office
16 to communicate anything on your behalf to
17 the landfill?

18 A No.

19 Q Are there any concerns that you took steps
20 to bring to the landfill management's
21 attention then on July 22nd rather than
22 keeping them in your pocket for your
23 expert report six weeks later?

24 A No.

25 Q By the way, just to be clear about it,

Rough draft

1 today being October 14th, it's not quite
2 three months since your measurements were
3 taken at the landfill but it's pretty
4 close, isn't it?

5 A Yes.

6 Q And so did you know that there were people
7 out in public actually marking days off
8 the calendar of your three to six months
9 and to them you would be within seven days
10 of the reaction hitting the radiologic
11 material?

12 A No. .

13 Q Did you happen to look up last week's data
14 submission to see if there is anything new
15 to worry about?

16 A I just looked at the temperature profile
17 that was presented and it seemed to be
18 generally stable except one of the process
19 seemed to be going up which was of concern
20 to me.

21 Q In particular in the data submission that
22 was most recently provided last week
23 because they're provided every week, did
24 you look at whether these two gas
25 extraction wells that I referred to as

Rough draft

1 sentinels GEW 10 and GEW 39 remained /(
2 unimpacted?
3 A No, I didn't, sir.
4 Q why not?
5 A well, basically, I had lots of massively
6 higher pressures on me in terms of
7 proposal submissions and keeping my
8 regular day job going.
9 Q Because your entire life is is not being
10 an expert witness in this case?
11 A Correct.
12 Q But if you were I mean if you were really
13 scared that there was some imminent
14 problem and data became available to you
15 that you could check and confirm whether
16 or not, you would make a point to check?
17 A Yes, sir.
18 Q How did you find Mr. Foss-Smith?
19 A He seemed as a knowledgeable individual in
20 landfill fires and seemed, you know,
21 helpful or tried to provide helpful
22 information to me.
23 Q Did you know him professionally before?
24 A No.
25 Q Did you find him on Google?

♀

Rough draft

1 A Yes. Basically when I was looking for
2 water-gas shift reactions, I Googled
3 water-gas shift or something and somehow I
4 came across a paper that he did on that
5 material and that's how I established
6 contact. And subsequent to that, I think
7 during our conversation learned that he
8 had some communication with Todd Thalhamer
9 or reviewed some paper or something so
10 there was somewhat of a connection there.
11 But I initially located him through this
12 paper.

13 Q [REDACTED] [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

20 A [REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED] [REDACTED]
[REDACTED]

Rough draft

1 with Todd where I wanted to share with
2 him, you know, my observation. I was very
3 excited about this five step reaction that
4 I was kind of seeing and that I felt that
5 the bulk of the reaction process was being
6 triggered by this chemical reaction rather
7 than a smoldering event and basically I
8 value always Todd's professional opinions
9 and so I wanted to explore that with him.
10 Q I'm betting he didn't like what you had to
11 say?
12 A He didn't express that in any way. I
13 didn't get that read from our discussions
14 at all.
15 Q Did he ask you to review his expert report
16 and see what he was going to say?
17 A No.
18 Q And if I ask this before I'm sorry but
19 I've forgotten did you ever review his
20 expert report?
21 A No.
22 Q Written communications with Thalhamer?
23 A I have no recollection of any e-mails
24 going back and forth.
25 Q Did he share any information with you

Rough draft

1 about any other landfills including County
2 wide or any others?
3 A Not recently. I'm trying to recollect if
4 at one point I was given a video of a
5 steam event and I can't remember actually
6 if P that was from him or somebody at a
7 course that, you know, demonstrated
8 basically massive amounts of steam that
9 was coming out of a drill for a health and
10 safety course that we did together.
11 That's the only thing that County wide
12 that I have a recollection of ever seen.
13 Q That drill was not being built at
14 Bridgeton?
15 A I do not believe so. My understanding is
16 it was at County wide, but I don't even
17 really know. Actually, the voice on the
18 video says it's Dr. Something something
19 somewhere and I thought it was County
20 wide, but.
21 Q Was it really short, a few seconds?
22 A No, it might have been -- no, I think it
23 was more like a minute or two.
24 Q Okay.
25 A And it's basically a track drill rig and

Rough draft

1 two drillers running away and they come
2 running away from the drill a whole bunch
3 of steam comes out.
4 Q Now, if you're right that the reaction can
5 occur below the water table, then one
6 thing that you would not see is
7 essentially Geysering?
8 A It's interesting where I was just in
9 Iceland where the I've seen the process of
10 Geysering and by Geysering you mean like
11 actuallywater shooting out into the
12 surface.
13 Q What I'm referring to is some pathway
14 leachate or groundwater or reaction in the
15 area of the landfill that allows a clear
16 pathway to the atmosphere and superheated
17 liquid then comes out of that surface like
18 old faith fulfill only on a smaller scale?
19 A Yeah, I've never seen that, so that
20 process happens it's kind of hard for me
21 to visualize.
22 Q In the absence of the reaction happening
23 in water, that couldn't take place, right?
24 A Probably with the exception of sort of the
25 perched water tables that you mentioned if

Rough draft

1 P there's high pressure steam coming up
2 and water is pouring up it can get carried
3 up as well.

4 Q Did Mr. Thalhamer tell you about the
5 leachate Geysering that was occurring --

6 A Not to my recollection.

7 Q Did he tell you what project by the way
8 for Indian Harbor was the most analogous
9 to Bridgeton?

10 A The only one I have recollection of being
11 discussed at all that he had been
12 previously involved with with County wide
13 I don't know of any others that he had
14 worked on.

15 Q He hasn't talked to you about a landfill
16 called Congress Development in the Chicago
17 area?

18 A Not to my knowledge. I think the only
19 time I heard congress mentioned was in the
20 depositions I reviewed because I think
21 there were four or five landfills that
22 were described and potentially SSSER.

23 Q No one ever called them that but you?

24 A Okay.

25 Q But no one has ever used that term but

♀

Rough draft

1 you?

2 A Right.

3 Q Anywhere?

4 A As far as I know, not.

5 Q It's 5 o'clock. why don't we break for
6 the day and start again in the morning. I
7 think if we start in 9:00 I think that's
8 pretty safe territory?

9 THE WITNESS: No problem for me.

10 THE VIDEOGRAPHER: Going off the record. This is
11 the end of media unit number 4. The time
12 is 5:01.

13 (PROCEEDINGS RECESSED AT P.M.)

14 (PROCEEDINGS RESUMED AT P.M.)

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