

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION
HEARING DAY 02

Agenda No. 11-23

Moderated by Dylan Fuge
Thursday, November 9, 2023
9:01 a.m.

Pecos Hall Hearing Room
Wendell Chino Building, 1st Floor
1220 South Saint Francis Drive
Santa Fe, NM 87505

Reported by: James Cogswell
JOB NO.: 5531768

A P P E A R A N C E S

List of Attendees:

Dylan Fuge, Commissioner/Chair

William Ampomah, Commissioner

Greg Bloom, Commissioner

Jesse K. Tremaine, Attorney

Dana Hardy, Attorney

Deana Bennett, Attorney

Earl DeBrine, Attorney

Daniel Rubin, Attorney

Brandon Powell, Deputy Director

Phil Goetze, UIC Manager

Tom Merrifield, Witness

Million Gebremichael, Petroleum Specialist

Ochi Achinivu, Chevron

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

I N D E X

WITNESSES:	DX	CX	RDX	RCX
BRANDON POWELL				
By Mr. Tremaine	9			
By Ms. Bennett		20		
PHILLIP GOETZE				
By Mr. Tremaine	27			
By Ms. Bennett		84		
By Ms. Hardy		94		
MILLION GEBREMICHAEL				
By Mr. Tremaine	119			
By Ms. Bennett		131		
By Ms. Hardy		132		

E X H I B I T S

NO.	DESCRIPTION	PAGE
Exhibit Tab A	Application Case No. 23686 (includes C-108)	/9
Exhibit Tab B	Application Case No. 23687 (includes C-108)	/9
Exhibit Tab C	Support Letters	/9
Exhibit Tab D	Consolidated Hearing Exhibits	/9
Exhibit Tab E	Witness Resumes	/7
Exhibit Tab F	Hearing Notices	/8
NO.	DESCRIPTION	PAGE
OCD:		
Exhibit 1	Mr. Powell's Education & Experience	12/12
Exhibit 2	Mr. Goetze's Resume	30/31
Exhibit 3	Mr. Gebremichael's CV	121/121
Exhibit 4	Overview of Production Information and Practices.	13/
Exhibit 5	Reference for DMG by Nance, Bureau of Economic Geology, University of Texas	31/86
Exhibit 6	Cumulative Information	35/86
Exhibit 7	Exhibits and Orders Related to the BOPCO Cases	43/86

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

E X H I B I T S (Cont'd)

NO.	DESCRIPTION	PAGE
OCD:		
Exhibit 8	Presentation	49/86
Exhibit 9	Texas Rail Commission Approves Grading	52/86
Exhibit 10	Seismicity	55/86
Exhibit 11	OCD List of Conditions	60/86
Exhibit 12	OCD's Proposal	123/132
Exhibit 147	Chevron Presentation, Date Revised	/9
Exhibit 150	Chevron Presentation, Label Revised	/9

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

P R O C E E D I N G S

MR. FUGE: Good morning, everyone.
Dylan Fuge, Chair of the Oil Conservation Commission
calling to order day two of our November 2023 oil
conservation commission hearing that was previously
noticed with our original notice. I'm going to run
through a quick roll call. Commissioner Ampomah?

MR. AMPOMAH: Present.

MR. FUGE: Commissioner Bloom?

MR. BLOOM: Here.

MR. FUGE: Let the record reflect that
we have a quorum and the whole commission's present,
and we are resuming case number --

What's the case number?

MS. BENNETT: 23686 and 23687.

MR. FUGE: We're -- we are resuming
case numbers 23686 and 23687, the application of
Chevron to construct two salt water disposal wells in
the Delaware mountain group.

Where we left off yesterday was OCD was
going to begin its -- the Oil Conservation was going
to begin its affirmative testimony, but I understand
from counsel for the parties there may be some
administrative matters to discuss first, so I will
turn it over to Ms. Bennett for the record.

1 MS. BENNETT: Thank you very much.

2 Yesterday we, at the end of the day, we
3 closed our case, but there were two sets of exhibits
4 that I wanted to admit before our case is officially
5 closed. And those two sets of exhibits are fairly
6 ministerial.

7 The first set of exhibits is Tab E,
8 which is the witness resumes. And we walked through
9 the witnesses' qualifications on direct and on the
10 witnesses were accepted as -- their credentials were
11 accepted as a matter of record.

12 So I'd ask that Tab E, the witness
13 resumes, be admitted into the record.

14 (Exhibit Tab E was received into
15 evidence.)

16 MR. FUGE: Any objection?

17 UNIDENTIFIED SPEAKER: None.

18 MS. HARDY: No.

19 MR. FUGE: Considered amended.

20 MS. BENNETT: Thank you.

21 And the final exhibit packet or tab is
22 Tab F, which are the hearing notices showing that
23 notice of these hearings or these cases as you all may
24 know were originally set for hearing before the Oil
25 Conservation Commission and then they were continued

1 to the Commission.

2 And so the -- Tab F shows that notice
3 of the hearings were kindly mailed, and that
4 publication was kindly done. And so I would ask the
5 admission -- oh, and there's also a self-made
6 declaration myself that goes to those facts as well.
7 So I would ask the admission of Tab F, the hearing
8 notices.

9 MR. FUGE: Any objection?

10 MR. BLOOM: No objection. The exhibits
11 are admitted.

12 (Exhibit Tab F was received into
13 evidence.)

14 MS. BENNETT: Thank you. And then I
15 have one more item I'd like to share. Yesterday
16 during the hearing, we were asked to submit revised
17 exhibits -- two revised exhibits. This exhibit is
18 revised to only show the change in the date.

19 Yeah, I apologize that it's not ideal
20 the way I'm looking at it right now. There we go. So
21 we changed the date. That's the only revision for
22 this exhibit.

23 And then on this exhibit, which was --
24 is marked as page 150 of 267. We revised the label as
25 requested by Mr. Ampomah. And so with that, I would

Page 8

1 ask that these two exhibits be admitted into the
2 record to replace the prior exhibits.

3 MR. FUGE: Any objection?

4 MR. BLOOM: No objection.

5 MR. FUGE: Exhibits are admitted.

6 (OCD Exhibit 147 and Exhibit 150 were
7 received into evidence.)

8 MS. BENNETT: Thank you. And so just a
9 final request that all of the exhibits that we
10 submitted in Tabs A, B, C, D, E, and F and these final
11 two exhibits be admitted into the record for these two
12 cases.

13 MR. FUGE: Any objections?

14 MR. BLOOM: None.

15 MR. FUGE: They're admitted.

16 (Exhibit Tab A through Tab D were
17 admitted into evidence.)

18 MS. BENNETT: Thank you very much.

19 MR. FUGE: Mr. Tremaine?

20 MR. TREMAINE: Thank you, Mr. Chair.
21 The Oil Conservation Division would
22 call our first witness, Mr. Brandon Powell.

23 May I have permission to -- sharing
24 screen?

25 MR. FUGE: Yes. May I ask the court

1 reporter to swear in the witness?

2 THE REPORTER: Please raise your right
3 hand.

4 WHEREUPON,

5 BRANDON POWELL,
6 called as a witness and having been first duly sworn
7 to tell the truth, the whole truth, and nothing but
8 the truth, was examined and testified as follows:

9 MR. FUGE: All right. The witness may
10 be seated in order to begin.

11 DIRECT EXAMINATION

12 BY MR. TREMAINE:

13 Q Good morning. Could you please state your
14 name for the record?

15 MR. TREMAINE: For those following
16 online, we had a computer get kicked off the network.
17 Bear with us one second. We'll resume in a moment.

18 All right. All right. Just
19 confirming. Court reporter, can you acknowledge you
20 can hear us again?

21 THE REPORTER: I can hear you. The
22 last thing I heard was Mr. Tremaine asking for the
23 witness's name.

24 THE WITNESS: Brandon Powell.

25 MR. TREMAINE: Okay. We're going back

Page 10

1 to instructions. Got it.

2 MR. FUGE: Were you able to -- do you
3 have the swearing in of Mr. Powell?

4 THE REPORTER: I have -- I have the
5 swearing in of Mr. Powell, if we could resume from
6 there, please.

7 MR. FUGE: Okay. Apologies, Mr.
8 Powell. You may begin your testimony.

9 BY MR. TREMAINE:

10 Q Okay. So Mr. Powell, what is your current
11 position with the Oil Conservation Division?

12 A My current position is the deputy director
13 overseeing environmental and engineering.

14 Q And as the deputy director of the Oil
15 Conservation Division, can you -- describe your duties
16 in that role?

17 A My current role overseeing the Engineering
18 Bureau, I oversee the UIC Group, the Administrative
19 Permitting Group, and the Inspection Groups, and then
20 also the Engineering Bureau Chief.

21 Q Could you also please provide for the
22 Commission a summary of your education and experience
23 outside of the deputy director role?

24 A As it relates to this case, I've been with
25 the OCD since 2006, so just a little over 17 years. I

Page 11

1 have overseen -- their whole engineering well works,
2 those kind of things since 2011. And then since 2020,
3 I've directly overseen the UIC group as the
4 Engineering Bureau Chief and then I was promoted to
5 the deputy director earlier this year.

6 Q Is your education and experience summarized
7 in what's marked as OCD Exhibit 1?

8 (OCD Exhibit 1 was marked for
9 identification.)

10 A It is.

11 Q Is that the document that's on the screen
12 right now?

13 A It is.

14 Q And you prepared that document?

15 A Yes, I did.

16 MR. TREMAINE: I have -- I would move
17 admission of OCD Exhibit number 1.

18 MR. FUGE: Objection?

19 MS. BENNETT: No objection.

20 MR. FUGE: Admitted.

21 (OCD Exhibit 1 was received into
22 evidence.)

23 MR. TREMAINE: All right.

24 BY MR. TREMAINE:

25 Q And Mr. Powell, I'd like to move into the

1 substantive portion of your testimony and direct your
2 attention to OCD Exhibit number 4.

3 (OCD Exhibit 4 was marked for
4 identification.)

5 Did you prepare this exhibit?

6 A Yes, I did.

7 Q And could you please briefly summarize --

8 MR. FUGE: Mr. Tremaine, are you
9 intending to have Mr. Powell recognized as a technical
10 expert or otherwise?

11 MR. TREMAINE: No, we were -- fact --
12 as a fact witness -- on history and summary. We have
13 two technical experts coming shortly.

14 MR. FUGE: I just wanted to clarify.
15 Thank you.

16 MR. TREMAINE: Thank you.

17 BY MR. TREMAINE:

18 Q Mr. Powell, could you please briefly
19 describe the Exhibit 4 for the Commission?

20 A So Exhibit number 4 -- and I'll go through
21 it in its entirety -- it's intended to be an overview.
22 The DMG injection as it relates to production in the
23 areas in the southeast part of New Mexico.

24 It's a high level overview of production
25 information and practices. It's a culmination of

1 information pulled from OCD information; information
2 from the Bureau of Geology and then from various
3 papers.

4 Q Thank you. So, Mr. Powell, the first page
5 here on Exhibit number 4, which is up on screen, is
6 just the introductory slide. If I could point you to
7 slide number 2. Could you please summarize slide --
8 the information that's contained on slide 2?

9 A So slide 2 goes through an overview geology
10 wise of where the -- DMG is located and the production
11 history of the DMG through the different decades; how
12 the different decades produced the different zones.

13 Also, it summarizes that in 2007, there were
14 250 productive pools in the DMG, and through 2010 the
15 cumulative production is shown at the bottom of the
16 slide for the DMG as a whole.

17 Q Are there any specific areas on this slide
18 that you would highlight and point out to the
19 commission as significant in reviewing this case?

20 A So as it relates to this case, when you look
21 at formations on the righthand side, you'll see where
22 the bell in the Cherry Canyon that Chevron's proposing
23 were primarily produced from the -- our drilling would
24 happen between the '50s and the '80s.

25 The Brushy Canyon, which they are planning

1 on doing a DFIT in but not producing is a formation
2 that has had wells drilled between the '90s and then
3 current.

4 Q -- and Mr. Powell, we'll move on to slide
5 number three. Could you please describe to the
6 Commission the information that's contained on slide
7 number three?

8 A So slide number three just goes over
9 historical practices as it relates to the DMG. Most
10 of these practices started or happened in the 2010s.
11 And it starts off with pre-2010. Most DMG disposals
12 in the DMG were smaller, centrally located fill base
13 wells.

14 The volumes were significantly smaller than
15 what we're seeing being utilized today. The next two
16 bullets are just summaries of different times --
17 significant times in the DMG injection in the area.

18 And then slide number four, BOPCO cases that
19 were significant as far as limiting DMG injection in
20 the area because it showed where wells had crossed
21 over to production and inhibited that production.
22 Part of the -- at least one of those wells, when I put
23 this slide together were still not -- had still not
24 recovered.

25 As a result, a growing interest, and issues

1 in the DMG disposal, NMOGA provided an exclusionary
2 map for restriction DMG injection that correlative
3 rights and reduce drilling complications in the area,
4 and I believe that's the same one that Chevron's
5 already shown. But I'll get to that later in my
6 slides as well.

7 Q Now, in terms of the history and primacy
8 practices that are outlined on this slide, how does
9 your deputy director's position be formed and how is
10 this history form how you reviewed applications for
11 injection in this area, essentially where OCD's
12 overarching concerns?

13 A So OCD's overarching concerns and DMG
14 injection as a whole is centered around correlative
15 rights, ensuring that they're protected, that we're
16 not sacrificing correlative rights for injection
17 intervals for future because correlative rights are
18 one of our primary drivers for protection, so it's
19 just to make sure that those are protected.

20 Q Moving on to the bottom, actually, I can
21 stay on -- strike that.

22 Moving on to slide number four, Mr. Powell,
23 could you please describe for the commission the
24 information contained on slide number four?

25 A So the map on the left is the NMOGA

1 identified protectable areas. These are the areas
2 that Chevron has already addressed in their testimony
3 that related to the Avalon -- potential cross flow and
4 production there.

5 The slide on the right was a map that was
6 put together by the Bureau of Geology, and it shows
7 high potentials for production in the future. If
8 there's high, moderate, and low potentials as shown by
9 the red, the green, and the blue lines around the map
10 to show future potentials in that area as they were
11 determined in 2007.

12 Q And the for, you know, purposes of
13 clarification, is it fair to say that these -- that
14 the areas depicted on this map are the same as the
15 areas that were described in Chevron's testimony or
16 stated otherwise? There is not an actual dispute
17 about areas on this slide?

18 A There's not a dispute. I don't believe
19 Chevron, shown on my map on the right, but they did
20 show the map on the left.

21 Q Moving on to slide number five. Okay. Mr.
22 Powell, can you please briefly describe the
23 information that's contained on this slide?

24 A So this is the rough overlay that combines
25 the -- or on the NMOGA map with the potential

1 production map and then it inserts the two Chevron
2 wells in the areas. It shows that both map -- or --
3 wells being proposed by Chevron are outside of that
4 high potential area that was previously identified.
5 And -- but both inside of the area of the NMOGA --

6 Q Right. And for clarification, how is the
7 NMOGA map depicted on this overlay?

8 A So the NMOGA map is in that light blue line
9 that overlays the three lines of the high potential
10 area.

11 Q So from a high level review from OCD's
12 perspective these wells -- proposed wells are outside
13 of the high potential production DMG zone but within
14 the one protection zone noted or proposed by NMOGA.

15 A That is correct. They're -- the wells are
16 on the outer boundaries of the Avalon -- by NMOGA and
17 is outside the high potential by the Bureau of
18 Geology. It -- the way OCD's looking at them is OCD
19 doesn't support the application nor does it oppose it
20 because of the lack of information that's in the area.

21 That's why the OCD technical witnesses later
22 on will go in depth as far as what we're recommending
23 required for these wells and future wells. Because we
24 see them as an area that we just don't have a whole
25 lot of information. So we need to gather that

1 information.

2 Q Given this background to, you know, the
3 history that you outlined about the development and --
4 in the area, any concerns highlighted in your
5 presentation? Does OCD have any recommendations for
6 conditions of approval, appropriate guidelines that
7 you had the commission to approve regarding this and
8 future applications?

9 A So the technical witnesses will dive into
10 the conditions that OCD has -- is looking for and
11 they're better versed to talk about those conditions
12 themselves, but yes, we see them -- this area is
13 similar to like a development well for production.

14 It's outside of an area that's known
15 to -- to be used. So we're looking for conditions
16 that will properly evaluate that area as they develop
17 it --

18 Q Okay. And we've heard, you know, in the
19 application -- there's styling of this project as a
20 pilot. And we've heard some testimony -- yesterday.
21 From your perspective as the deputy director of OCD,
22 what's the significance of a pilot designation in the
23 context of the salt water as opposed to a well?

24 A I think it's extremely necessary in this
25 area because of the unknown circumstances in the area

1 to do the proper testing. They can do the proper --
2 gather the proper information to see what really we're
3 looking at out there.

4 It's similar to an exploratory well for
5 production where you go out to a well, you drill it,
6 you gather information before you do drill additional
7 wells. So it's really necessary from that
8 perspective.

9 Q So from OCD's perspective it sounds like the
10 styling of this as a -- this proposal as a pilot
11 project and the inclusion of specific conditions of
12 approval, data gathering, testing, monitoring, am I
13 understanding correctly that you believe that's both
14 appropriate and administratively feasible for OCD?

15 A I do, and I believe it's also necessary to
16 gather the information that can ensure correlative
17 rights too.

18 Q Thank you. The last question, Mr. Powell.
19 We heard yesterday about Chevron's proposed monitoring
20 and notification related to the potential
21 interference. Do you recall that testimony in the
22 exhibit?

23 A I do.

24 Q In your opinion as deputy director, when and
25 how should such notification of potential interference

1 or actual interference occur to OCD? When should that
2 be provided?

3 A So what I would be looking for from the OCD
4 side is any time there's a potential for interference
5 that at least as a courtesy the operator would be
6 informing the OCD and other regulatory agencies of
7 that potential so we're aware of the situation as they
8 work through their process.

9 Q So it sounds like you would ask that
10 operator to not wait until interference is necessarily
11 confirmed but if there's material information
12 suggesting possible interference -- well you would
13 want notification as to the occurrence at that point
14 in time.

15 A That's correct. Because the -- the reviews
16 and the studies that go along with that can take
17 considerable time and if the OCD and other agencies
18 were informed of -- they're aware of the process
19 moving through.

20 MR. TREMAINE: Mr. Chair, I'm done with
21 our questions on direct.

22 MR. FUGE: Thank you, Mr. Tremaine.

23 Ms. Bennet, do you have any questions
24 for the witness?

25 MS. BENNETT: Just a couple. Thank

1 you.

2 CROSS-EXAMINATION

3 BY MS. BENNETT:

4 Q Thanks so much for being here and for the
5 exhibits that you all prepared. It's very helpful, so
6 definitely appreciate it. I just had a couple of
7 questions for you.

8 If we could turn back to page 2 of Exhibit
9 4. On this page you discussed in the 2000s there were
10 some -- horizontal production in the Brushy Canyon.
11 Have you looked at how close that horizontal
12 production is to the proposed Severitas well or --
13 well?

14 A So I have not personally -- I know Chevron
15 in their proposal looked at all DMG production within
16 a two-mile radius and they didn't discover any in this
17 area.

18 Q Thank you. And you have no reason to doubt
19 the voracity of their review?

20 A No --

21 Q Okay.

22 MS. BENNETT: Then if you could turn to
23 the next page I think it was Mr. Tremaine? -- applied
24 with the -- one more, please.

25 MR. TREMAINE: This is number 13.

Page 22

1 MS. BENNETT: Thank you.

2 BY MS. BENNETT:

3 Q So this slide shows the NMOGA identified
4 protectable area on the left; right?

5 A That is correct. Yeah.

6 Q And it was not intended to be an exclusion
7 zone; was it? It was intended to be a protectable
8 area?

9 A That's correct. To my knowledge, it's a
10 protectable area. I believe our technical examiners
11 will go through it more extensively, but yes.

12 Q Okay. But to your understanding, it was
13 never meant to be a per se prohibition of disposal in
14 that area?

15 A Correct.

16 Q Do you know if BOPCO was acquired by XTO?
17 Do you know that?

18 A Offhand, I didn't do that research.

19 Q Okay. Earlier you mentioned that OCD or the
20 Division is, sort of, taking a wait-and-see approach;
21 or not taking a position one way or the other on these
22 two applications because of the need to gather
23 additional testing information and to evaluate DMG
24 disposal?

25 A Correct.

1 Q And did -- you were here, though, when
2 Chevron went through its protocols for the data that
3 it's going to gather and it's monitoring approach?

4 A Yes, I was.

5 Q Did -- do you have any concerns with the
6 data gathering that Chevron is proposing?

7 A Between the data gathering Chevron's doing
8 and the COAs that OCD is looking at placing, that's
9 why we're not opposing it because we feel it is
10 necessary to gather that information.

11 Q So the Division is on -- agrees that
12 additional information is necessary to be gathered
13 then as we -- currently and you see that as one of the
14 goals of Chevron's --

15 A Yes, I do.

16 Q Let's see. The other item I wanted to just
17 briefly discuss with you, and this may be something to
18 discuss more with the other Division witnesses -- but
19 it is about the conditions of approval. As I -- as we
20 discussed yesterday, Chevron has some further
21 questions or information that they'd like to discuss
22 with the Division about those conditions of approval.

23 Is the Division open to having those types
24 of discussions with the -- with Chevron?

25 A I think the Division's always open to have

1 those types of discussions to make sure we get the --
2 the best information possible.

3 Q And I think that's all the questions I have.
4 Thank you very much.

5 A Thank you.

6 MR. FUGE: Ms. Hardy, do you have any
7 questions for the witness?

8 MS. HARDY: I do not. Thank you.

9 MR. FUGE: Dr. Ampomah, do you have any
10 questions for the witness?

11 DR. AMPOMAH: -- yeah, a few. Yeah, so
12 in your slide number two you showed that there are --
13 wells during the 2000s in the Brushy Canyon. So is it
14 a concern for you when Chevron proposes to do DFIT in
15 this particular formation?

16 MR. POWELL: I am not because of the
17 area that they're looking at doing it in. There's no
18 current production shown. My estimation, and I have
19 not verified this, would be that those wells in the
20 Brushy Canyon are going to be in those high productive
21 areas that were identified in the map that I showed in
22 the -- later slides.

23 MR. AMPOMAH: So in your pre-hearing
24 statement you said -- OCD's not ready to support
25 pressing against the application, but it sounds to me

1 like based on the description let's say going through
2 the process, sounds like you are personally in support
3 of the data gathering.

4 MR. POWELL: We are in support of the
5 data gathering, but for the injection wells themselves
6 in that particular area, there's not enough
7 information for us to support the injection itself.
8 But we do support the data gathering to get to that
9 point.

10 MR. AMPOMAH: So yesterday Chair talked
11 about the Commission working on the milestone to be
12 added to the conditions of approval. Is there
13 something that -- OCD is also in support of?

14 MR. POWELL: Yes.

15 MR. AMPOMAH: Okay. Thank you.

16 No further questions.

17 MR. FUGE: Mr. Bloom?

18 MR. BLOOM: Mr. Chair, no questions.
19 Thank you.

20 MR. FUGE: Mr. Powell, just one
21 clarification, just to clarify your testimony on
22 Chevron's flow chart that we don't need to pull up
23 about identifying potential interference.

24 Is it your position that you would just
25 like sort of concurrent notification to OCD of

1 potential interference?

2 Do you want OCD involvement throughout
3 the resolution, or do you just want notification and
4 then sort of not engagement and then engagement as
5 Chevron proposes, which is sort of when they can't
6 work it out? What's the OCD's position?

7 MR. POWELL: I think what is initially
8 discovered conferring notification and then any mile
9 stones or -- or a plan of action as it goes through.
10 I don't see it as being official as far as within
11 certain dates, but I think -- what the general plan is
12 and what the -- and then any general milestones as
13 they get through that process.

14 MR. FUGE: So is it fair to say your
15 position is you'd like the OCD to receive notification
16 throughout even though it may not necessarily be a
17 decision maker as it works through?

18 MR. POWELL: That's correct.

19 MR. FUGE: Okay. No further questions.

20 Mr. Tremaine, do you intend to reserve
21 Mr. Powell or are you done with him for --
22 presentation?

23 MR. TREMAINE: Mr. Powell's free to
24 go --

25 MR. FUGE: Call your next witness.

1 MR. TREMAINE: All right. Mr. Chair,
2 the -- I think we can -- I would call on Mr. Phil
3 Goetze.

4 THE REPORTER: Please raise your right
5 hand.

6 MR. TREMAINE: It's raised.
7 WHEREUPON,

8 PHILLIP GOETZE,
9 called as a witness and having been first duly sworn
10 to tell the truth, the whole truth, and nothing but
11 the truth, was examined and testified as follows:

12 THE REPORTER: Thank you.

13 DIRECT EXAMINATION

14 BY MR. TREMAINE:

15 Q Thank you, Mr. Goetze. You may sit down.

16 Good morning, Mr. Goetze. Could you please
17 state your name for the record?

18 A My name is Phillip Goetze. Last name is
19 G-O-E-T-Z-E.

20 Q And Mr. Goetze, what is your current
21 position with the Oil Conservation Division?

22 A I am the UIC manager, underground injection
23 control manager, for the Division.

24 Q Could you please briefly describe your
25 duties as the UIC manager?

Page 28

1 A A majority of my duties is to oversee both
2 the permitting compliance as well as problematic
3 obligations. These include reporting to the EPA or
4 grant funding as well as both UIC wells that are
5 issued with permits under the Oil and Gas Act as well
6 as the Water Quality Act.

7 I also serve as the managers overseeing
8 personnel and doing those details.

9 Q Could you please provide for the Commission
10 a summary of your education and experience beyond the
11 UIC manager role?

12 A I've probably been with the Division for 11
13 years now. I was part of the UIC Group from the
14 beginning, but I also share responsibilities that we
15 represent some 300 cases, which I issued orders on.

16 I, prior to that worked for a consulting
17 firm doing assessments as well as characterization of
18 waste -- and going back even farther several prominent
19 national environmental firms doing underground storage
20 tank removal waste characterization.

21 I also performed as a contractor oversight
22 for EPA -- to consent order consent agreements. Prior
23 to that I was with the U.S. -- well, Bureau of Land
24 Management to Wyoming overseeing oil and gas
25 operations and lease resolution.

1 That was a job inherited from my job prior
2 to the United States Geological Surveying which I did
3 both coal and oil gas notifications for the state of
4 Wyoming.

5 That was briefly interrupted with a stint
6 with the United States Bureau of Mines doing mapping
7 of wilderness areas and with that -- prior to that I
8 was a graduate of New Mexico Tech class of '77 with a
9 geology degree.

10 Q Mr. Goetze, is your education and experience
11 summarized in OCD Exhibit number 2 -- which I'm
12 currently doing a very poor job sharing. Is this your
13 resume or curriculum vitae?

14 (OCD Exhibit 2 was marked for
15 identification.)

16 A Correct.

17 Q Okay. And you prepared this?

18 A I did.

19 Q Okay. And at this -- have you testified
20 before the Oil Conservation Commission in the past?

21 A Yes in both capacity as a witness for
22 rulemaking as well as a witness in cases before the
23 Commission.

24 Q And have you previously been tendered and
25 accepted as an expert -- Commission in areas of

1 petroleum engineering and underground injection?

2 A Correct.

3 MR. TREMAINE: At this time, Mr. Chair,
4 I would -- the admission of OCD Exhibit number 2 and
5 admission of Goetze as an expert in areas of petroleum
6 geology and underground injection.

7 MR. FUGE: Any objection?

8 MS. BENNETT: No.

9 MR. FUGE: The exhibit's submitted and
10 the witness is so recognized.

11 (OCD Exhibit 2 was received into
12 evidence.)

13 BY MR. TREMAINE:

14 Q Mr. Goetze, I'm going to move on to a series
15 of exhibits and walk these through kind of the
16 substance of your testimony now. If I can point you
17 to the screen and OCD -- to the Exhibit number 5.

18 (OCD Exhibit 5 was marked for
19 identification.)

20 Could you please -- what is this exhibit?

21 A As far as the typical presentation regarding
22 Delaware Mountain Group, we provide to Commission as
23 well as our examiners a base document that gives the
24 best documentation on what the Delaware Mountain Group
25 is composed of. Literally, this is the reference for

1 DMG written by Nance, Bureau of Economic Geology,
2 University of Texas.

3 We use it a lot and we has a lot of our
4 interpretations off the information that's given. It
5 also provides a snapshot. Its figures are very
6 representative of what type of environment we're
7 dealing with, especially when we use this interval for
8 injection, which is becoming more apparent that it's
9 going to be a place to go to.

10 So with this we provide both commissioners
11 and our examiners the ability to see details, which I
12 think gives you a better spatial understanding of what
13 we're dealing with.

14 Q All right. Mr. Goetze, this is a reference
15 to a paper so I'm not going to ask you to go through
16 all of it. It's available for the parties in the
17 information sheet to review in detail.

18 But I'm going to ask you now if you can give
19 a highlight for the Commission some cases of specific
20 areas of the paper that OCD focuses on in reviewing
21 applications such as the applications in these two
22 cases.

23 A -- that -- I would take you to figure 8,
24 which I believe is page 69. It gives you a sense of
25 the complexity of what we're dealing with. Even our

1 old mapping has been very substantial, the subsurface
2 geology; we have a lot of information.

3 Still the -- the three formations represent
4 very much a -- an interrelationship that has been
5 complex for us to -- keep within our definitions and
6 our permanent guidance. The cherry -- Bell canyon
7 Cherry and the lower Brushy Canyon. Of the three, the
8 Brushy represents the most diverse as far as
9 channeling and structuring and features.

10 And of course, this represents also
11 typically what is now the last prominent play within
12 the three formations.

13 The -- the upper Bell is developed as stated
14 before earlier, and with the progress of horizontal
15 drilling the Brushy Canyon was for a period of time a
16 very high priority target.

17 Another figure that I referred to would be a
18 figure 4. That would be 65, and basically, what
19 you're looking at is an oversight which goes along
20 with -- fire -- representative as far as features that
21 have been mapped and then let no -- again this is a
22 reference and something for your consideration should
23 you have questions about what we're working with as
24 far as this injection interval.

25 Q Mr. Goetze, I -- did you hear yesterday the

1 discussion and testimony regarding lineaments and --
2 water movement pathways in the geology they were
3 talking about?

4 A Yes.

5 Q Okay. Are these represented -- and you
6 mentioned there's already -- represented in these
7 figures that we're discussing?

8 A They contribute to it. But by and large,
9 our -- our concerns -- it is the relationship we have
10 historically had Bell Canyon and Cherry Canyon and
11 as -- preferred -- injection environments. And we --
12 on our efforts trying to keep Brushy isolated. But at
13 the same time historically, this has been difficult
14 with our old methodology of processing permits.

15 All right. So in many aspects we do have to
16 rely on the operator to provide us information. So
17 the water flows. The things that we see tend to be a
18 relationship that we have associated with prior
19 injections and have had issues with -- in certain
20 locations within the basin.

21 Q Mr. Goetze, in your opinion, what are the
22 necessary takeaways from this paper as OCD's reviewing
23 the applications?

24 A That at this point -- and I think we've come
25 to this discussion already -- the more information we

1 have the better we have to understand where injection
2 can occur to be successful; where it can't be.

3 The present system of permitting has not had
4 the level of investigation and therefore the
5 permitting process itself has created its own problems
6 of not successfully preventing waste, which is one of
7 our directives.

8 Q Mr. Goetze, I'd like to direct you to OCD
9 Exhibit number 6. And I believe we'll recognize this
10 exhibit, but -- virtual connectivity interruption --
11 Exhibit 6.

12 (OCD Exhibit 6 was marked for
13 identification.)

14 A Six is a cumulative representation of
15 information that was compiled beginning in 2016/2015.
16 It was an effort to qualify what areas of concern
17 operators had as well as our history of permitting and
18 disposal of Delaware Mountain Group.

19 After 2014, we were seeing increased demands
20 for DMG injection, and we were facilitating that with
21 a very impressive record of permit issues. With it we
22 ended up with several incidences which caused us to
23 have consternation to put it lightly and make us take
24 a step back as to having DMG as an -- a preferred
25 disposal interval at that time.

1 The NMOGA participated in this. We asked
2 them to see what would be an area that would be
3 especially with the Avalon and Upper Bone Springs and
4 our efforts to get together and come up with an
5 initial assessment resulted in this map.

6 Along with this, I've also added case
7 histories and particular cases where we've had either
8 denial or approval in which the Delaware Mountain
9 Group was brought either before the Division or
10 Commission.

11 Q So Mr. Goetze, I think that you had just
12 testified that there were some areas of concern and
13 that -- resulting in consternation on the part of OCD
14 UIC permitting. How were those areas depicted on this
15 exhibit?

16 A We have areas outlined in red. These
17 represents areas where we've had reports of
18 interference, either with Bone Springs; or we've had
19 issues with drilling the Delaware Mountain Group or in
20 one case we actually had a well in disposal well
21 flood.

22 Also, it includes and outlines things
23 that -- things that -- enhanced the EOR project, which
24 is in the Delaware Mountain Group. So what we're
25 seeing here is -- is reports and documentation of

1 effects that have been initially related to Delaware
2 Mountain Group injection.

3 Q And are -- I think you touched on this, but
4 to be specific, are specific protests depicted on
5 this?

6 A Well, we have a case -- it's the next
7 example -- I believe it's in -- there you go --
8 getting close to it. In the middle there. That big,
9 long yellow -- can you magnify?

10 So yeah. So he selected what is going to be
11 the next exhibit.

12 And this would be the BOPCO case versus
13 Mesquite and Chevron and OXY with regards to Delaware
14 Mountain injection.

15 MR. FUGE: Mr. Tremaine, can you have
16 the witness just explain where that is on the map with
17 the circles again?

18 MR. TREMAINE: Yes. That -- manage my
19 mouse.

20 BY MR. TREMAINE:

21 Q So Mr. Goetze, can you please describe the
22 shape and the location on the exhibit to identify that
23 specific case? As it -- appears on screen.

24 A It's the application -- authority for two
25 SWD wells.

1 Q That's central?

2 A Yeah. Correct.

3 Q Central circle?

4 A Yes.

5 Q Okay.

6 A And then the -- below it and then then the
7 circle over there and the cluster of wells.

8 Q So this area in the center here that I'm
9 kind of outlining with my cursor, that's the case in
10 here, the interference issue --

11 A Correct.

12 Q And just to reiterate, the other -- red
13 outline areas are instances of no intentional
14 interference?

15 A Correct.

16 Q Okay. So in summary, you know, what is
17 the -- what are the necessary takeaways from this
18 information in terms of how OCD is reviewing
19 applications for injection permits in this area?

20 A At this point, this is one of these areas
21 where we have high concerns about the issuance of
22 Delaware Mountain permits without having some strength
23 of information. We've had applications in these
24 areas, and several of our applicants have withdrawn
25 those applications upon request for additional

1 information.

2 We have had applications outside of the
3 delineated area. Those applications have also been
4 withdrawn, but I think the majority of it is that at
5 this time, the Division went towards seeing if the --
6 virtual connectivity interruption -- and the mass of
7 applications at that time went for the deeper
8 interval, and we did not have as many Delaware
9 Mountain Group applications.

10 However, at that time, during this period,
11 the Division did take the opportunity for those
12 operators who had small operations who had existing
13 DMG wells and had to have them reissued that we went
14 ahead and -- and supported that effort.

15 We also have had the issuance of DMG
16 intervals for what are known as slurry [ph] wells
17 associated with surface waste facilities. And we also
18 have had, as the Commission knows, applications for
19 the class 2 acid gas wells, which have preferred DMG
20 at this point.

21 And we had used that as an option in
22 locations where we do have gas processing facilities
23 when the -- is not available.

24 Q So Mr. Goetze, a few more questions.
25 Tangentially related to this slide, did you observe

1 and, you know, listen to the discussion and
2 presentation yesterday by Chevron regarding potential
3 alternative interference pathways?

4 A Yes.

5 Q Is it your understanding after listening to
6 that presentation that injection interference was --
7 cannot yet be eliminated as a cause of the
8 interference observed, for instance, in BOPCO cases?

9 A I think BOPCO cases are certainly a classic
10 example of cause and effect and there seems to be
11 little question as to what the source was. But there
12 may be opportunity for many things to contribute to
13 the interference in that we are only beginning to
14 understand and have information to assess what we are
15 observing now.

16 Again, we are deficient in having any type
17 of correlation in some of these cases. We do not know
18 the source.

19 Q So is it fair to say that as the UIC manager
20 you remain current as OCD's concerns remain and you
21 still have to manage the permits in this area to
22 account for potential interference for injection?

23 A Well, we do proceed with caution, knowing
24 that our permits once issued, it is up to the Division
25 to pull them back from hearing. The other thing is

1 that again, being assigned to the prevention of waste
2 and the protection of correlative rights, we've had
3 issues where in the case with the BOPCO case exceeded
4 the area of review, in which case that means we have
5 violated that obligation.

6 And in the case of BOPCO again, we had a
7 washout of resources. And again, for protection of
8 the resource and prevention of waste was not
9 satisfied, so we tend to have been more conservative
10 in the issuance of permits and Delaware Mountain
11 Group.

12 A Mr. Goetze, well, that being said, will OCD
13 consider and incorporate the alternative information
14 provided by Chevron yesterday?

15 Q The Division is always open to having more
16 qualification -- the issue. That helps us in our
17 permitting system, and certainly it helps us in our
18 compliance and our obligations. So yes.

19 A And I think -- do you recall from
20 yesterday's testimony regarding the area impacted by
21 the injection -- we were talking about -- seven-mile
22 radius?

23 Q The -- we're talking about spacing and
24 distancing or -- or just --

25 A It -- well, what I'm getting at is --

1 Q The distance that the DMG can travel is very
2 good. It is something with the right conditions
3 again, would exceed the area of review and again,
4 violate our conditions of our permit.

5 Q Okay. That's what I'm getting at, Mr.
6 Goetze. Do you think that Chevron's two-mile area of
7 review is more prudent than the existing standard half
8 mile area of review often utilized in SWD
9 applications?

10 A Well, again, that would be prudent.

11 The Division has learned from the experience
12 with its acid gas wells and one-mile area of review
13 has been quite significant and worthy in permitting
14 those, and as certain attorneys in this room know,
15 that the Devonian effort that we went through with
16 Division's hearings to establish a one-mile AOR in
17 order to provide better protection as well as allow
18 for resources to be developed or, you know, the
19 reservoir to be efficiently used for disposal when
20 considering the cost of the well.

21 So we always are interested in -- in trying
22 to provide some sort of management in the sense that
23 the -- resource will not be swallowed up I want to say
24 with too many permits in the same location.

25 Q So Mr. Goetze, last question -- is: Is it

1 fair to say then that provided the uncertainty in the
2 information that we've been discussing during this
3 hearing that it would be OCD recommendation to
4 utilize -- to consider -- or that the Commission
5 consider utilizing a two-mile area of review for
6 future similar DMG applications?

7 A It would be worthy of consideration, yes.

8 Q All right -- on to -- 7 -- virtual
9 connectivity interruption -- referenced so far. Could
10 you please summarize for the Commission the content of
11 Exhibit 7?

12 (OCD Exhibit 7 was marked for
13 identification.)

14 A I think this was -- this was provided as
15 the -- the worst case scenario. At this time,
16 Division was issuing permits, we were looking at --
17 and there's a singular event; very myopic -- in this
18 instance we had a cluster of Delaware Mountain Group
19 wells that were approved.

20 Two of them were already in place and
21 performing quite well. A fifth well was there -- had
22 been plugged and abandoned. Two new wells were
23 approved. And the two new wells, of course, were
24 reentries of older wells, and with the approval of all
25 these wells in this area, we received notice from

1 BOPCO that they had been -- had issues with wells at
2 the Poker Lake unit in the northeast corner of it.

3 At first, they attributed it to injection;
4 and then they finally progressed to filing cases in
5 both the private operator of the two new wells as well
6 as the existing operators of the two wells that were
7 there prior to the Lasands [ph] case. It was a
8 Mesquite and -- and Chevron and OXY.

9 Q So, Mr. Goetze, isn't the -- just to wrap
10 that up, that you're saying that Exhibit 7 contains
11 the -- exhibits and orders related to the BOPCO cases
12 we were referencing?

13 A Correct.

14 Q Okay.

15 A It's a snapshot of -- of what happened.

16 Q And I believe you were about to refer to
17 the -- to the next exhibit, which -- is page 97.

18 A So the picture in the --first period just
19 shows you the wells that -- were inactive -- three
20 horizontal and the location of the four wells and one
21 plugged and abandoned well all DMG injection wells.

22 Q And in order -- and for clarification
23 purposes, these are the same wells in terms of the
24 Mesquite injection wells and BOPCO wells, which were
25 discussed in Chevron's testimony yesterday?

1 A They were referenced, yes.

2 Q Okay. And kind of skipping ahead, Mr.
3 Goetze, what were the results of these cases?

4 A The results of these cases -- the two
5 Mesquite wells, these were an operator which purely
6 was focused upon disposal. They had no rental
7 interest. The other two wells, one owned by OXY; one
8 by Chevron, supported their field operations.

9 And so their operation, their well remained
10 intact, they provided information, extensive studies,
11 including follow-up tests, Hall's plots and -- as well
12 as wellbore information, which supported the
13 proposition by them that both their wells were not a
14 contributing factor to the situation that BOPCO had in
15 their horizontal -- the non-operator or the commercial
16 disposal company, settled and -- came to an agreement
17 with BOPCO which resulted in revocation of their
18 permits and eventually the plugging of their wells.

19 Q So in summary, certain of the injection
20 wells remained in use and received injection while
21 certain other wells were -- their injections -- was
22 revoked?

23 A Correct.

24 Q And are there any kind of salient
25 differences between those wells you have and the

1 Commission?

2 A I believe the -- the cross section is the
3 next figure in -- it has the location of the cross
4 section and the notation. And then that's the cross
5 section. Again, noting to the Commissioners, the --
6 both the Chevron and OXY role completed with the
7 intent of disposal with case and purpose intervals and
8 kept them up in the Bell and Cherry Canyon.

9 The Mesquite wells were approved with
10 open-hole section. They were not selected for
11 location. They were just the opportunity to take on
12 plugged well reentered and get a permit for. So at
13 this time, we did specify that there would be a plug
14 back in one well.

15 Though the paperwork said it was done, the
16 final order for this well was a request to wireline --
17 to demonstrate there was plug in there, but that was
18 not done.

19 That's a discussion for another day about
20 wells that are under Federal authority versus State
21 authority. But it does demonstrate a reason why we're
22 saying we don't want the open hole; we want the cased
23 interval.

24 I think it represents a better management
25 process and controls if you do have issues then

1 briefed casing not only allows for better monitoring,
2 but also -- it also encourages if you want to do
3 testing. One of the things we do like to see is
4 injection surveys.

5 I know a lot of the pushback we get from
6 operators in open-holes -- I'm going to do Downhole
7 with casing that -- that goes away. There should be
8 no reason why.

9 Q So is it fair to say that is largely the
10 basis for OCD's recommendation that the injection
11 wells would be completely cased in cement and
12 injection -- through progressions?

13 A Correct. Correct.

14 Q Okay. Is there anything else that you'd
15 like to highlight in Exhibit 7 for the Commissioners
16 here today?

17 A We do have one more exhibit -- that was
18 Exhibit 18 by BOPCO. Again, showing BOBCO went in and
19 brought in their information, which they had developed
20 for placement of their horizontal wells -- realize
21 that at 2014/2015, this was very rare information.

22 So they did formation micro bridging brought
23 in and showed that we had an existing fracture system
24 that no one is aware of through our permitting process
25 for the SWDs we did not entail such requirements.

1 Such information was truly oriented towards
2 production. And the reason why BOPCO oriented its
3 wells as it did within the Poker Lake unit or the
4 Brushy.

5 So again, the effort by the producer to
6 bring out more detailed information that gave us a
7 greater understanding of why these wells and these
8 cluster of wells were able to reach so far and
9 having --

10 Q Okay. In your -- just at a higher level,
11 and you've referenced some of this, but I just want to
12 clarify your thinking. You know, in your professional
13 opinion as a UIC manager and applicable more so
14 generally to DMG injection applications, you know,
15 what are the lessons learned from the BOPCO cases?

16 A Well -- that the -- we have learned some
17 lessons, but as we move forward in DMG, I think the
18 requirements for better information for better
19 qualifying when necessary. Our old practices will not
20 stand.

21 I think, if we're going to be protective of
22 resources especially, we need an effort to have the
23 permitting process include the operator with greater
24 degree of information prior to the need to have --
25 approval. Especially if we're doing it in --

1 Q I'm going to direct you now to OCD Exhibit
2 number 8.

3 (OCD Exhibit 8 was marked for
4 identification.)

5 Mr. Goetze, what is OCD Exhibit number 8?

6 A OCD Exhibit number 8 was a presentation
7 given on behalf of NMOGA's director at that time
8 regarding evaluations that had been done on the
9 Delaware Mountain Group, and especially in compiling
10 information.

11 This was our first effort to have a snapshot
12 of what we thought were concerns with DMG. One of the
13 issues that we've had both in the injection and
14 testing layer through the -- test and the request for
15 injection pressure increases has been a recognition
16 that a fair amount of DMG in this area has a low
17 formation parting structure.

18 As noted before, the Division in its
19 agreement with the EPA under its primacy with the EPA
20 awards a 0.2 PSI per foot calculating gradient for the
21 surface -- maximum surface pressure. This is based
22 upon information from the folks who submitted the
23 original primacy demonstration, and it's served us
24 well.

25 Anything above that, you must prove --

1 typically it's been with step rate test -- where the
2 formation parting pressure is. And with that, we will
3 approve a increase in the pressure with a safety
4 margin gradient. The information obtained in looking
5 at what was an historically old step rate test as well
6 as production information -- that would be a fact
7 worth done in Brushy -- done in Cherry.

8 That what we see that it was considerably
9 advantageous for us to pay particular attention -- we
10 get request to go anything above 0.2. And so it
11 doesn't mean we haven't had areas that showed good
12 quality and an increase in pressure with no problems,
13 but again, we were faced with this fact that we're
14 seeing irregular or inconsistent issues with our own
15 step rate test and with it the approval of -- pressure
16 increases, which resulted in formations being fracked
17 as a result of injection.

18 So in some cases, and in the case of the
19 BOPCO, we actually approved a pressure that was not --
20 pressure representative of the formation. In those
21 cases, my interpretation was a -- a fracking
22 representative of the confining layer that was being
23 fractured.

24 So our own process and our concerns were
25 being brought to us that some operators were seeing

1 an -- an interference in Avalon shale, and some of
2 this is being attributed to the fact that we did allow
3 for pressure increases -- increases that were above
4 the formation range.

5 Q So Mr. Goetze, I think you provided a -- us
6 a summary of this. Is there any specific areas as
7 seen in Exhibit number 8 that you can highlight for
8 the Commissioners here?

9 A Well, there was -- well, I would -- the Road
10 Hills West frac grain -- I believe that's slide 131 --
11 Again, showing you the trend that we were close to the
12 0.2 PSI. So it's not that we're not aware of it and
13 we do have enough information. The other factor gets
14 to be yes, it's -- it's that information has to be
15 specific to the area that we're actually looking
16 injection.

17 This -- this concept of regional application
18 seems to fall apart, and this is what we've been doing
19 previously, that if we had an SRT in one area, we were
20 extending it in many cases arbitrarily to another well
21 in the same interval.

22 So other than that, basically, this
23 information is there for the review, and it pointed
24 out the concerns of the industry at that time in both
25 Avalon and some Brushy communication -- DMG wells.

1 Q So Mr. Goetze, is it fair to say that then
2 this paper you highlight and it's -- was attributed to
3 OCD's review and concerns about permeated pressure and
4 specifically that 0.2 PSI?

5 A That's --

6 Q And isn't it also fair to say that another
7 takeaway is that those injection wells in the DMG need
8 to be assessed and permitted based on more detailed
9 local geographical information -- geological
10 information?

11 A That's correct. And -- and again, this
12 resulted in 2016 and 2017; 2018 with a workshop with
13 operators to discuss this matter. And at that point,
14 again, the Division was looking at the -- as an
15 alternative. And so we still discussed Delaware
16 Mountain Group, but there was -- seemed to be a loss
17 of interest at that point.

18 Q Okay. Mr. Goetze -- and direct you to OCD
19 Exhibit number 9.

20 (OCD Exhibit 9 was marked for
21 identification.)

22 Could you please describe for the Commission
23 what Exhibit 9 is?

24 A Yeah, number 9 in -- this is brought out by
25 Chevron yesterday, is just a highlight to the

1 Commission that the Texas Rail Commission, which has
2 the authority for a 0.5 PSI -- approved grading at --
3 to determine maximum surface injection pressure has
4 mandated that Delaware wells within the seismic
5 response areas that they have -- that they're cutting
6 that to 0.25.

7 And it's -- it's a discussion that I've had
8 with their folks. They felt that it would be best in
9 their interests to at least go in that direction. So
10 we're seeing now in the Texas sized similar interest
11 in DMG and how to manage injection pressure down
12 there.

13 Again, I would highlight that it's in the
14 seismic response area, and to that point, Texas was
15 also approved larger capacity wells in DMG, but they
16 do not have the constraints that we do.

17 Q How does this inform OCD's history of
18 injection pressure and -- do in New Mexico?

19 A Well, it supports that our current 0.2 PSI
20 is a good place to start.

21 Q Okay.

22 A So with that, if you want to go up and above
23 then the opportunity to test and provide us
24 information that is accurate and provide us with
25 something that we can put in permit and feel confident

1 with and ensure that the injection is confined within
2 the injection interval.

3 Q And what are the -- you just referenced
4 mechanisms that might be necessary to support larger
5 than a 0.2 PSI. Just at a summary level, what would
6 those mechanisms be? Like a step rate test? Or --

7 A Well, I mean, a step rate test is a classic.
8 DFITs? We've had DFITs. It's been used in horizontal
9 ER projects where we've had concern -- injection
10 pressure and people are working on -- where sections
11 with two horizontal wells in Bone Springs.

12 DFITs have been used in there to demonstrate
13 to us that we're actually getting a proper injection,
14 and it is beneficial; and we're not fracking. So
15 other information, the whole -- was used by both
16 Chevron and OXY to defend themselves in the BOPCO
17 case.

18 Fallout tests have been used to demonstrate
19 to keep flow -- radial flow demonstration. So there
20 is a variety of information available.

21 Q And is it -- we're going to get there in a
22 little bit, but is it true that the SRTs are
23 referenced in the Hall's plots are included in OCD's
24 recommendation for --

25 A That's correct.

1 Q And after the discussion we had yesterday,
2 the testimony we've heard, and your consideration,
3 would you support the inclusion of DFITs as one of the
4 requirements for these wells?

5 A I would think they'd be a vital tool.

6 Q All right, Mr. Goetze. I'm going to move on
7 to OCD Exhibit number 10.

8 (OCD Exhibit 10 was marked for
9 identification.)

10 My computer stops on me now. This
11 exhibit -- paper -- so I'm going to leave it here and
12 ask you to describe for the Commission, you know,
13 what is this paper and what is it about?

14 A Basically, it -- it correlates to what is
15 already considered by Chevron. This paper does
16 highlight the effort to seismicity from our
17 understanding down -- that the reason I brought this
18 to the attention of the Commission is that the figure
19 2 again -- getting a snapshot of understanding.

20 We have less concern with regards to
21 seismicity issues with the current understanding of
22 relationships.

23 At the same time, we also note that we'd had
24 several operators highlight to us that they'd come
25 across faulting and traction system as demonstrated by

1 the BOPCO case that there is information out there
2 which needs to be considered when we're doing
3 injection Delaware Mountain Group that may impact how
4 the flow is around that well.

5 Currently we do not request or get that
6 information, but I think this is going to be an
7 ongoing process where we're going to see more
8 information come forward.

9 Hopefully, in doing so, we can modify the
10 permit to satisfy those conditions and make sure that
11 we don't have waste, or we have flow correlative
12 rights.

13 Q Mr. Goetze, if you could check the screen,
14 is this --

15 A That's the one.

16 Q That's the --

17 A That's the one. The bottom cross section.

18 Q Okay.

19 A That would be B.

20 Q And so as I -- if I'm understanding you
21 correctly, is it accurate to say that the OCD's
22 concern is either fracture or faults; did I get that?

23 A Both. Both of them can get treated; both
24 can -- again, we want to have a good radial flow out
25 from the well. We don't want to find something and

1 not -- and suddenly take off. So that becomes the --
2 management processes is that we do have -- best
3 quantification and the permit conditions that make
4 that injection live long and does not interfere with
5 correlative rights.

6 Q And did I hear you correctly that the -- for
7 a standard SWD application OCD does not necessarily
8 get information that would depict those faults or
9 fractures?

10 A That's correct.

11 Q And what sort of information could
12 applicants such as Chevron provide to the OCD
13 generally to provide the appropriate degree of
14 confidence in identification of fractures or faults in
15 this area?

16 A Well, besides what we've already listed in
17 our exhibit, a lot of the operators in these areas
18 didn't have information regarding production wells,
19 would it?

20 I think being able to look to the historical
21 record and see if they have information in the DMG if
22 it's an application -- if they have something in that
23 area, this would provide us with a better picture and
24 certainly a better model as to the effects of any type
25 of fracture or faulting system in the area.

1 And if we do have a good demonstration of no
2 issues then we can certainly issue a permit with less
3 restrictions and certainly a greater efficiency.

4 Q Okay. In review of, you know, Chevron's
5 applications in this particular case, it sounds like
6 from your testimony -- discussing certain things that
7 Chevron may have provided in this application.

8 Are there any areas, you know, such as we've
9 just talked about where it would be beneficial for
10 Chevron to provide additional information?

11 A Well, at this point in time a list is fairly
12 complete and exceeds what we had originally thought
13 so. But the caveat to that is that this why we're
14 asking? And we think of it as a pilot project. Is it
15 going to be necessary for this for every operator
16 inside of the Avalon area?

17 Is it going to be part of our standard
18 operating procedure? What gives us the greatest
19 information and decision making? And what can we
20 approve administratively and what do we need to go to
21 hearing for?

22 So I think beneficial for both the operator
23 as well as our obligations under the statute, this is
24 something that we'll need to have in the future if
25 we're going to utilize Delaware Mountain for expansion

1 of disposal.

2 Q Mr. Goetze, you just brought up the pilot
3 project concept here and I'm hoping you can give, you
4 know, your perspective to the Commission in the
5 context of a salt water disposal well.

6 If there's anything to add to your previous
7 testimony, what is the significance of this pilot
8 project?

9 A That's a trick question.

10 It is not uncommon for the Division to go to
11 the Commission or its own Division examples to
12 establish a record, and in this case, we've had a
13 limited DMG injection. And so we know our
14 shortcomings; but at the same time, if we're going to
15 move forward with DMG injection, the opportunity to
16 put into record at least some quantification that we
17 can use in our permitting process without going to
18 the -- gives us the opportunity to move forward and
19 utilize this as a guide.

20 And I think that's the most important thing.
21 Once we've established a pattern that gives us a level
22 of confidence that we're protecting correlative rights
23 that our AORs are being met as far as notification as
24 well as issues of how big the plume can be or how far
25 it goes.

1 The pilot project at least lays out a
2 pathway and it also allows us the opportunity to make
3 changes. If we find something better; if we find even
4 a more accurate process or if we need -- we've got a
5 problem, for instance, in a certain area, that we can
6 come back to the Commission or Division and say the
7 protest or say we just don't want injection
8 necessarily because we have problems.

9 Q Is it fair to say that there are certain
10 factual patterns in context where OCD might consider
11 approval like administrative commissions but there are
12 other fact patterns which UIC -- may need to come
13 before the Commission --

14 A I am sure there will be situations where we
15 will have a -- a request for the industry that will
16 come back to the Commission or Division to make a case
17 either -- and typically, it's either to get more
18 information or in the case of opposition to having
19 that permit issued.

20 Q I think this is a good time to segue into
21 the OCD Exhibit number 11.

22 (OCD Exhibit 11 was marked for
23 identification.)

24 Mr. Goetze, is it accurate to say that this
25 is a list of conditions or guidelines that OCD would

1 be proposing in the event of an administrative DMG SWD
2 approval?

3 A Correct.

4 Q Okay. So with that as the premise, it would
5 also be accurate to say that applications such as
6 Chevron's applications that apart from certain of
7 these conditions, such as location of an injection
8 well within that proposed Avalon protection zone.

9 And that's one of the primary reasons why
10 this case -- OCD feels should be correctly before the
11 Commission?

12 A Correct. The concern was that it's in an
13 area that we've had very poor experience in and in had
14 at this point not necessarily had a prohibition on,
15 but necessarily felt uncertain as to how the
16 permitting process should proceed.

17 Q So based on that and the constraints you
18 previously opined, is it your opinion that, you know,
19 additional -- on Exhibit 11 in a second -- but the
20 overarchingly because of the factual context here OCD
21 feels it's appropriate to require additional
22 information, additional conditions and guidelines,
23 correlative to what's currently being required for,
24 for instance, a Devonian injection well?

25 A Yes. I have been -- we need to take it

1 farther. Our slurry wells in the Delaware Mountain
2 Group, we asked for more information for those, and we
3 approved more testing with those. And with the
4 Devonian wells, the information, including induced
5 seismicity assessment and to the extreme, the acid gas
6 wells. We were looking at long term injection --
7 that's something that's hazardous.

8 So what we have tried to do is now provide
9 at least a -- a base level of information for the
10 applicant that they know about our -- and submitting a
11 C-108.

12 Q All right. Mr. Goetze, I'd like to, kind
13 of, walk through in a little more detail -- it seems
14 like, you know, Exhibit 11 is really the substance of
15 OCD's request that in these cases and, kind of, how
16 it -- plans.

17 So if I could highlight to you -- direct you
18 to, you know, one criteria selection. If we could
19 briefly walk through and maybe identify the kind of,
20 the basis for each of these requirements for the
21 Commission to review.

22 So I think we've already talked about this
23 in some detail, so 1A -- if we're talking about Avalon
24 production, is it fair to say that is simply an
25 identification that, you know, given the information

1 currently before the Division, OCD and UIC in
2 particular are -- don't have adequate information to
3 administratively approve injection wells within that
4 Avalon protected area.

5 A We don't have sufficient information to have
6 a level of confidence to issue a permit that we feel
7 will be -- be direct as far as protection of
8 correlative rights as well as keeping the injection
9 interval, you know, confining layers correct.

10 Q Okay. And then in terms of the 1B -- this
11 probably speaks for itself, but OCD is not going to
12 administratively approve location for wells that
13 previously been denied. And that's going to apply to
14 either OCD or OCC hearings?

15 A Yeah. Pretty much. In -- well, the
16 majority of them are OCD. I mean, yeah, Division
17 hearings. Commission hearings are very rare. I know
18 I think there's only two or three cases. But I think
19 the vast majority of it is Division hearings. So if
20 the Commission wishes to include Commission hearings,
21 mostly it's about Division, and most of that is about
22 the use of old wells for reentry of injection.

23 Q So in the instance where there's a well
24 closed for an SWD image and it's rejected, any future
25 application for that location would have to come

1 before the Commission?

2 A -- we'll leave that up to the Commission,
3 but this should go to hearing. Other -- provision.

4 Q Okay. And if you could speak a little bit
5 to 1C here, the exclusion locations that have
6 demonstrated water flows interference.

7 A I think it's just the practicality. If
8 you're looking at putting a well in an area where
9 we've got somebody already reporting issues but -- I
10 think it just -- why go down that road again? So is
11 there a debate about the -- the little circles? Yeah,
12 there is.

13 But in general, you've already got existing
14 injection in there already, so chances are that you're
15 going to get additional injection DMG in that area is
16 low anyways.

17 Q Could you now -- kind of, explain OCD's
18 thinking with 1D's uniform distance between DMG wells?

19 A Well, the BOPCO case showed us that putting
20 them too close to each other was a good synergistic
21 effect. We've also seen similar issues with the DMG
22 wells on the Texas side, where they are clustered
23 right up to the state line as well as -- as many as
24 four in the section.

25 So with that in mind, the balancing act

1 of -- of starting off with distance and using that as
2 a way to make sure that whatever the operator chooses
3 for the injection DMG that we're going to have a
4 successful well. We're going to have a reservoir
5 that's going to last for a while. We don't even have
6 this synergistic effect.

7 We proposed a model. It may be greater; it
8 may be less. But I think that's one of those things
9 that the Chevron experience will show us, as well as
10 some of the other information that we're gathering
11 from other operators who are proposing Delaware
12 Mountain Group injection.

13 Q Is this a recognition of concerns about the
14 impact of injection areas and beyond -- in the DMG
15 expanding beyond the standard area of review for SWDs?

16 A Right now, we have a standard 1.5 mile
17 for -- for anything outside of the -- nonacid gas.
18 This is our primacy agreement. There is concern and
19 if we get in the middle of an argument about whose
20 well it is, spacing with the wells gives a greater
21 ability to at least to concede or at least have a
22 management decision as to how these wells should --

23 Q And based on the testimony we heard
24 yesterday and our discussion today, and the area of
25 impact spread by Chevron's presentation, would OCD

1 support expanding this to two miles such as the area
2 of review utilized by Chevron?

3 A We always wanted to look at the greater
4 distance between wells.

5 Q Can you briefly explain to the Commission
6 the purpose of -- three miles of gas processing?

7 A This was our best estimation. The acid gas
8 wells, as you all are aware, have had difficulties
9 with deeper injection -- DMG -- for earlier days -- to
10 Devonian. As information is developed, again, these
11 gas processing facilities are -- are located land
12 locked investments. They are critical to production.

13 And the operators of the gas processing
14 facilities have utilized injection means to alleviate
15 their flaring issues. The opportunity for over a life
16 of a plant to have several wells as the reservoir gets
17 filled up and being available for them to utilize the
18 same -- DMG interval, we -- we kind of would like to
19 have that buffer and that ability for the gas
20 processing facilities to be able to have some window
21 of -- of opportunity.

22 Otherwise, we will end up with this conflict
23 of disposal.

24 Q So essentially OCD is attempting to limit or
25 eliminate the overlap of free water injected zones

1 with acid gas injected.

2 A Correct. We have this already in one of the
3 Commission hearings, but we don't honestly -- salt
4 water disposal well in proximity to an AGI well and
5 the concerns that will affect the plumes and the
6 relationships especially in the model with the gas --
7 so -- you can't hold back a permit. It's better to
8 start up front and say, "We're not interested in
9 permitting this area."

10 Q Moving on to paragraph two, "Criteria for
11 selection of injection and interval," what's the
12 purpose for the exclusion of -- limestone from DMGs --

13 A The -- position for the interval which
14 receives -- in this case -- for clarification, we
15 don't include a confining layer -- so Lamar will be --
16 and Castile will be the confining layer. Therefore,
17 anything below the Lamar would be considered
18 injection.

19 Q Are there any concerns or necessary
20 corrections that OCD would point out in Chevron's
21 C-108 related to the Lamar limestone?

22 A Yes. It seemed to be included in the permit
23 and the advertisement, so when you advertise this --
24 this is what goes out to the public, therefore we're
25 saying you can inject into the Lamar. I don't believe

1 this is Chevron's intent, and I think this is more of
2 an administrative correction

3 Q Okay. So for the record, OCD is not in
4 support of a C-108 application that can be read to --
5 form an injection into the Lamar limestone?

6 A No. Not -- as -- as well as we've not
7 permit injection into the Woodford. We use it as a
8 confining layer, so it's not part of the injection --

9 Q But Mr. Goetze, with that clarification, did
10 I understand correctly that you believe that this
11 could be corrected through administratively
12 communication with Chevron?

13 A Correct.

14 Q And this -- later instance?

15 A I believe -- if -- if we have a discussion
16 with them and get more clarification, that this could
17 be done with just a correct well bore diagram. Under
18 the UIC rules, expansion of an injection interval
19 requires notification, but since we're contracting it,
20 the area's already covered. So it'd just be a
21 correction to meet the technical requirements.

22 Q All right. So moving on to the lower Brushy
23 Canyon, if I could summarize, is it accurate to say
24 that there's a similar -- OCD has a similar concern
25 related to the lower Brushy Canyon?

1 A Correct. The application center goes down
2 to top of Bone Springs. And so again, we would ask
3 Chevron to provide us with a -- a confining layer --

4 Raise your hand.

5 DR. AMPOMAH: I'm paying attention.

6 THE WITNESS: That the lower
7 description, the lower confining layer, be better
8 qualified -- modified the permit to again, give that
9 bottom injection -- the way it stands now is that the
10 -- we would be improving everything from the bottom of
11 the Castile to the top of the Bone Springs, which is
12 not -- not real.

13 BY MR. TREMAINE:

14 Q So with that clarification for the record,
15 again, that -- similar to Lamar limestone issue the
16 top confining layer this is something that you used
17 correct administratively?

18 A That's correct.

19 Q All right. And could you just briefly speak
20 to 2C, the area of review and how that specifically
21 applies for the DMG applications?

22 A Again, what we're trying to do is in our
23 discussion -- exhibits before -- the fact that there'd
24 be information available, again, the operator being
25 one that already has or has access to information,

1 which may be relevant. DMG to fact or false that the
2 operator provide that information and give us an
3 assessment.

4 At this point, we still go through the realm
5 of doing some sort of seismic response or -- seismic
6 evaluation. At this time, the current information was
7 seen as not a concern, but we still go through the
8 process of -- of demonstrating the zero and therefore,
9 would take the risk element out -- the -- from that
10 process.

11 Q All right. Just moving onto paragraph
12 three. Could you please clarify the purpose in 3A
13 "Distinguishing new well construction from existing
14 well construction?"

15 UNIDENTIFIED SPEAKER: Objection.

16 THE WITNESS: The greatest problems
17 we've had with old Delaware Mountain Group disposal
18 wells historically and then go in -- and old wells.
19 And so we inherit the problems of the old wells,
20 especially for things that were done in the '80s and
21 '70s -- down the -- Pennsylvania.

22 Drilling out plugs and then -- the old
23 casing was a very popular economic approach. Since
24 then, we've had several attempts for Cisco Canyon to
25 reenter, only to have dismal failure in wells plugged

1 with the -- with the top surface casing not even being
2 able to be cleaned out.

3 So current events and historical would
4 say we'd start with something clean. Let's find a
5 location. So I think also offers the operator the
6 ability to -- to select -- well surface location
7 that's better suitable for their operation as well as
8 what they have subsurface as far as geologic
9 information.

10 Q Mr. Goetze, can old wells or -- calling
11 converted production well -- can those old wells be
12 tested as effectively as a newly constructed well?

13 A There are limitations, and certainly you can
14 do a variety of logs, but if historical records --
15 again, sharing well information with the federal
16 folks -- a lot of times we have a lot of gaps.

17 When we do the review, especially for an
18 application without that information, we really can't
19 make an accurate assessment, even following with
20 integrity logs, these sort of things, it -- it just
21 doesn't -- you -- you're really throwing money down
22 the hole and starting with something clean is much
23 more beneficial.

24 Q Moving on to paragraph 3B, why does OCD want
25 to limit the outside dimensions for injection tubing

1 to 5.5 inches?

2 A Currently this has been our most
3 successful -- been proposed to go to seven -- been
4 proposed to go to nine inches but following the
5 Devonian case before Commission -- find that five,
6 five and a half at this point is -- is pretty
7 standard. If we wish to go above that, then let's go
8 to a hearing.

9 Q We've had a discussion about 3C yesterday.
10 Could you please summarize for the Commission the
11 purpose of 3C -- really what's the distinction between
12 frack jobs and acid jobs that are considered?

13 A Well, I -- the world of well stimulation has
14 many terms. And so all these wells are going to be
15 vertical wells. You do have people talking about
16 horizontal wells, but we'll worry about that -- that
17 some other day. But with the well completion, there
18 is a certain amount of well we have that has to be
19 done.

20 And so the use of -- of an acid and
21 pressurized and pushed out through the well into
22 formation is an accepted practice and we don't feel
23 that it -- it really takes away or diminish the
24 quality of the reservoir. The concern we have at that
25 point is that your pressure for the acid job doesn't

1 compromise the well integrity, the cement job. That
2 sort of thing.

3 And then it is a standard practice, so what
4 we're trying to avoid -- and we've had this issue that
5 some people have gone ahead and actually have
6 fractured the -- maintain the fracture systems -- was
7 dramatically changes the characteristics of the
8 reservoir. So with -- the injection -- as well as the
9 injection pressure. And later testing becomes
10 questionable at best.

11 Q So based on the information you have the OCD
12 the, you know, acid jobs such as are considered -- in
13 the Chevron application, those are not likely to
14 propagate fractures in the --

15 A That's correct.

16 Q All right. I want to move on to paragraph
17 four, "Additional testing and monitoring" -- you're
18 talking about this -- we could run through. Is it
19 fair to say that the recommended cement bottom here at
20 4A is in addition to a typical cement bottom --
21 requirement?

22 A Correct.

23 Q Okay. And what's the purpose for that?

24 A To have a good record. If there's
25 questions, we've had issues with even surface casing

1 not being properly installed. Then down the road we
2 will have complete records and certainly no questions
3 about the accuracy of the cement work on the well.

4 Q Okay. And Mr. Goetze, what's intended or
5 required under 4B -- lots

6 A Again, historically, the disposal wells,
7 many of the operators who come in and just put them in
8 do not conduct any type of walk. And so with our
9 request for higher information, certainly the log
10 suites would be beneficial and of course with that
11 also is the requirement that they be submitted to us.

12 So -- probably have to push on the -- log
13 issues, but by and large -- which has some Downhole
14 information. So as a minimum for other operators.

15 Q But the common theme for this hearing that
16 work as needed for the DMG?

17 A Correct. For permitting issues, yes.

18 Q We're going to talk about SRTs in more
19 detail in a minute, but if you could very briefly
20 summarize the, you know, the need or purpose behind
21 the 4C "Step rate testing for injections?"

22 A Yeah, I think this has been one of those
23 things that historically -- recommendations from other
24 operators is that the step rate test be done with
25 initial well conditions with initial reservoir.

1 We historically only had request or a need
2 for a step rate test after the well has built up
3 pressure and you're reaching that 0.2 PSI grade. And
4 so what started off knowing where we have a
5 formation -- and pressure, especially in light of DMG
6 having the opportunity for a low formation -- pressure
7 that this information be available and -- and that
8 way, the operation of the well, both the operator and
9 the regulatory group knows what direction we're
10 heading.

11 Q All right. And is it -- we've discussed
12 this, but just to clarify, it -- would paragraph four
13 here be the appropriate place to -- collude the
14 requirement for a DFIT test?

15 A Yeah -- any -- any additional testing would
16 be considered under this category, certainly.

17 Q Could you briefly speak to 4D? This
18 requirement to obtain a static bottomhole pressure --

19 A Well, this may become the grail of
20 information, both in the -- the Devonian cases as well
21 as -- we used to get bottom hole pressures for the gas
22 wells and -- and production wells. We have since lost
23 that interest or need.

24 I think this is going to be helpful in
25 regards to issuing -- scenarios -- I understand the

1 opportunity for increased injections, so again, bottom
2 hole pressure information is critical. You can see
3 this very, very good tool, and the best way to get it
4 is by saying put it in the permit and give it to us.

5 Q Could you please briefly speak to the need
6 in 4E for public seismic monitoring station?

7 A I think this is an opportunity in Texas.
8 What I did in 2018, where phase in of Delaware
9 Mountain Group, they broke it into three volume,
10 10,000 barrels per day; 20,000; 30,000 barrels a day.
11 It was noted that for the 30,000 barrel per day --
12 were requested to put in a seismic station for that
13 well.

14 Seeing how we are in an area that is
15 overlain by a variety of -- rays as well as multiple
16 injection intervals, I think it is best for the
17 Division to move forward at least fill in the gaps as
18 the state seismologist sees needed as well as provide
19 public information that can help assist us in better
20 managing.

21 Should there be an issue in seismicity, and
22 it may not be related to Delaware Mountain Group, at
23 least we have a location where we can get a better
24 picture of what the source is.

25 Q Mr. Goetze, can you please speak briefly to

1 4F, the reasoning for establishing the -- existing DMG
2 disposals wells as operational wells?

3 A We have -- we have had inquiries from
4 operators to take existing Delaware Mountain Group
5 wells, disposal wells and convert them to observation
6 wells. We are putting down bottom -- pressure bonds
7 or transducers to actually have information.

8 Most of it is being done in an effort to
9 better assess the impacts, not only to, well,
10 primarily, in some cases drilling -- if there's
11 problems with that but also resource protection.

12 So the opportunity to take existing Delaware
13 Mountain Group wells and convert them to observation
14 wells is a -- is a golden opportunity, but at the same
15 time, we will have to modify our -- our rules since
16 this would take this well out of the beneficial use,
17 probably created in an active well situation; that
18 sort of thing.

19 So we would probably seek administratively
20 the opportunity for operators to convert a disposal
21 well and turn it into an observation well and still
22 maintain bonding and keep it all -- active well, yes

23 Q Mr. Goetze, in terms of Exhibit 11 overall,
24 I just want to clarify in questions. You know,
25 inclusive of any modifications to this document that

1 are formed by this hearing, this is -- is it true to
2 say that this is what OCD would intend to utilize to
3 guideline for administrative approvals, assuming the
4 pilot project went forth successfully?

5 A Correct.

6 Q But also to clarify, you know, variations
7 from this administrative approval guideline document
8 could be approved by this Commission in future cases?

9 A Yes, I think that's one of the benefits to
10 the pilot project. If we find a tool in there that's
11 very beneficial, let us go ahead and utilize it as
12 part of the administrative process and therefore
13 remove the necessity for hearing. And again, the
14 management.

15 Q And again, but the guidelines that are laid
16 out here in Exhibit 11, is it true that these are
17 intended chiefly to assist the OCD in acquiring data
18 that may be necessary to assess both permitting
19 conditions, but future protected -- of observed
20 interference?

21 A Well, it -- both the permitting process and
22 the compliance process. We are required under EPA to
23 review the permits every five years and see if the
24 conditions have been met. And otherwise, there may be
25 an operator who will come forth and say that we do

1 have a situation.

2 This is one of the things that was brought
3 up in the Chevron process. Well, if it's such, we are
4 going to be participating because it's the injection
5 authority of the OCD under the Oil and Gas Act, which
6 would come into question.

7 Q And Mr. Goetze, in your opinion, are -- you
8 know, we covered the fact that these guidelines are
9 specific to the Delaware Mountain Group, and they are
10 frankly beyond what might be required in -- other salt
11 water disposal permits.

12 So is it your testimony today that these
13 additional conditions are warranted due to the
14 concerns that have been highlighted overall in this
15 hearing, regarding a lack of data regarding features
16 in the Delaware Mountain Group concerns for
17 correlative rights?

18 A Yes. And I'll add to that the DMGs become
19 again a focus for disposal and with it, the necessity
20 to -- qualify. And realize that Chevron's not the
21 only applicant and not the only type of applicant. We
22 will have big streams who will be looking at investing
23 large amounts of infrastructure as well as well
24 structure to accommodate other operators who no longer
25 carry their own disposal.

1 So they are gathering at the gate to see
2 what comes out of this. And we'll come away with
3 applications and I will further emphasize this with
4 the Devonian. See in 2018, we had 45 applications
5 and -- we had over 553 applications.

6 Q So is it fair to say, Mr. Goetze, that
7 the --

8 MR. FUGE: Keep going.

9 BY MR. TREMAINE:

10 Q Is it fair to say that the content of
11 Exhibit 11 is going to be critical for the OCD moving
12 forward in terms of establishing a floor for
13 acceptable permit application in the Delaware Mountain
14 Group?

15 A Right.

16 Q And you just testified to the kind of, one
17 of the primary drivers here and I think we heard some
18 testimony to this effect yesterday of the need for
19 previous water disposal in the southeast.

20 Is there any other information you'd like to
21 advise the Commission to, kind of, put it -- the scope
22 of that -- need in context? Like, what's the scale
23 that we're talking about here? Potential scale of the
24 Delaware Mountain Group injection?

25 A Well, you -- there -- it'll be expansive,

1 and it'll be exponential. My concern is that
2 Chevron's attempt to qualify and modify will have to
3 be continuous so it or in -- in cooperation with a
4 demand that will come up for Delaware Mountain Group
5 disposal.

6 The historical amount of application by some
7 operators to have four wells in one section has
8 already been laid out back in 2018/2019. And so this
9 will be -- this will be a big alternative to Devonian
10 and with it, the concern that we do at least get a
11 handle on it so that we do manage it properly.

12 We still will have Devonian. We still will
13 have Cisco. We still will have Avalon. We still will
14 have other areas, but the greater basin with the
15 Wolfcamp play and with the Bone Springs play. The
16 capacity need is -- there, and this is at that point.
17 One of the alternatives that's been offered.

18 Q Mr. Goetze, do you recall -- I want to
19 address this question of, like, maximum injection
20 volume versus pressure. Do you recall that question
21 yesterday from Commissioner Ampomah?

22 A No.

23 Q You do not? Okay. Well, then I have --
24 strike that then.

25 I'll let him raise that with you. -- do it

1 better than I will.

2 Okay. So --

3 A Well, I mean, there is a relationship for
4 volume and pressure. They're related. And so the
5 concern that I guess the question was in the permit
6 with the -- the amount -- and this has been probably a
7 more historical aspect of permitting process, tendency
8 is I would see applications for 50,000 barrels a day
9 for every well that ever came in. And it's not
10 realistic.

11 We understand. We have been trying,
12 especially for the Devonian wells, to finite this to
13 make it more accurate, especially when we ask them to
14 look at how far over a 30-year life, how far that
15 fluid would move out. And where these wells would
16 interfere with each other. I think for the DMG, we're
17 going to be faced with that same issue.

18 Some people will lay out an area, and we'll
19 probably be realistic about what kind of volumes they
20 can put in. My ten years with OCD -- if you get a
21 10,000 barrel a day, it's very good. We do have some
22 to achieve 20,000, but by and large, that's the room
23 we work in in order to protect correlative rights and
24 not have a fraction.

25 Again, Texas does not worry about

1 correlative rights and with it the -- the ability to
2 do 30,000 barrels a day with nine-inch casing, it's --
3 it's a reality.

4 Q As proposed by, you know, these terms that
5 are -- laid out in Exhibit 11, and the existing
6 injection pressure set by OCD, will the limitation in
7 the casing diameter and the pressure effectively limit
8 the injection volume?

9 A I think it'll be beneficial for us at this
10 point to work with what we know. And so we've had
11 success with this in the San Andres, which has its own
12 issues. But if we were trying to go bigger, I think
13 we need to take a step back, and that has to go
14 through a hearing process.

15 Q And I think the last question, Mr. Goetze,
16 what -- well, a couple questions I have. What if
17 approved -- if these applications are approved, what
18 will be the approved term of injection authority for
19 these faults?

20 Q Oh, apparently in 19 -- 19 -- 2020, we
21 reworked our permits. Our former UIC permits that we
22 issued were poor structured and did not incorporate
23 many of the rules that we have from the EPA.

24 The current permanent template includes a
25 lot of the mandatory language that we avoided, and

1 with it, we added a 20-year limit to the permit and at
2 that point and prior to that was until either you
3 exceeded the formation parting pressure or the well
4 fell apart.

5 Q Given all the facts presented in this
6 hearing, would you recommend to the Commission any
7 modification either to that term of injection
8 authority or a term of monitoring and reporting or
9 reconsideration of the permit?

10 A What a round of discussion this morning.

11 I think the term of the 20-year permit is
12 good but require reporting a frequency. I think --
13 and this will be -- on Chevron is that every two years
14 we get some sort of summary report because we're going
15 to be using this for guidance. We're going to be
16 using this to develop our own criteria.

17 So I -- there's no real reason to -- if the
18 permit is bad, the well is bad it's 40, 50; 30 years.
19 It doesn't matter. But as far as investment, the 20
20 year represents a good business investment and then --
21 condition of approval we require more higher frequency
22 of reporting.

23 Q So if the OCD -- if the Commission adopted a
24 two-year reporting rate requirement, reporting that to
25 the oil -- reporting certain information back to the

1 Oil Conservation Division, what would be -- what would
2 your recommendation be for the mechanism for OCD to
3 act on -- if necessary, on that report?

4 A Well, I mean -- well, there is the -- the --
5 sitting down negotiating with the operator. The final
6 ultimatum would be go to hearing. I think working
7 with the operator, making a presentation to the
8 director since it was an order signed by the director
9 as an alternative to hearing, it's more practical and
10 certainly more frugal with regards to staff and
11 management funds.

12 Q So ultimately the Division recommends that
13 this reporting and monitoring be delivered to the Oil
14 Conservation Division and that could ultimately if
15 necessary be elevated to the Commission?

16 A Yes.

17 MR. TREMAINE: And with that, Mr.
18 Chair, I am done with the direct examination. Thank
19 you.

20 MR. FUGE: Thank you.

21 Ms. Bennett?

22 MS. BENNETT: Thank you.

23 Thank you, Mr. Goetze. Thanks for all
24 that information. I appreciate the opportunity to be
25 here with you --

1 MR. BLOOM: Mr. Chair, can I ask for a
2 ten-minute break before we begin --

3 MS. BENNETT: All right.

4 MR. FUGE: All right. We will do a
5 ten-minute break. We will resume at 11:10 --
6 otherwise -- going.

7 (Off the record.)

8 MR. FUGE: Time to come back, everyone.
9 I'll actually give Commissioner Bloom one second to
10 return, but we will go ahead and get started
11 momentarily. Just a moment for those online.

12 Mr. Tremaine, while we're waiting for
13 Commissioner Bloom to return, we do have a quorum. I
14 understand there's an administrative matter we need to
15 take care of before cross?

16 MR. TREMAINE: Yes, similar to the
17 matter -- earlier I had intended to move admission of
18 Exhibits 5 through 11 prior to releasing Mr. Goetze,
19 but unfortunately, I have ended direct, so I would
20 move now admission of OCD Exhibits by point of order.

21 MR. FUGE: Any objection?

22 MS. BENNETT: No --

23 MR. FUGE: Those exhibits are accepted.
24 (OCD Exhibit 5 through Exhibit 11 were
25 received into evidence.)

1 MR. FUGE: Ms. Bennett?

2 MS. BENNETT: Thank you.

3 CROSS-EXAMINATION

4 BY MS. BENNETT:

5 Q And thanks again for being here and for all
6 that whole work that the Division did in preparing for
7 the hearings today as well as the meeting with
8 Chevron. So we appreciate it.

9 Just a few follow-up questions. It sounds
10 like the Division and Chevron are aligned on the need
11 for additional data in this area; is that an accurate
12 statement?

13 A I think it's reliable to say that for the
14 permitting process in general we need more
15 information.

16 Q And as I was sitting here, it sounded a
17 little sort of like a catch 22 or a chicken and egg
18 situation where the Division would like additional
19 data, but the additional data needs to come from the
20 ground up? Information due to the differences in the
21 complexity of the geology and things that you were
22 mentioning earlier.

23 A Historically this has been our function.
24 The operators provide us with the information since we
25 cannot collect it and therefore provide us with the

Page 87

1 basis for making a decision. So this is not uncommon.

2 Q And in your testimony, or actually, one of
3 the -- you noted that there was a benefit of the pilot
4 project was -- or a benefit of the pilot project is
5 this data gathering opportunity?

6 A Yes. It was always where we may have an
7 operator come forward and invest time and effort to
8 better qualify and quantify making the process --

9 Q Would -- you were here yesterday when the
10 Chevron's witnesses were testifying; is that right?

11 A Correct.

12 Q And do you recall testimony that one of the
13 reasons that Chevron picked these two wells for the
14 pilot project is the difference in geology -- between
15 the two wells?

16 A Yes.

17 Q Do you view that in your opinion as a
18 benefit of the pilot project having local area
19 information to be cited?

20 A Well, I look at it as a process that we can
21 copy with other -- locations within the DMG. The fact
22 that they chose two different types of areas would
23 indicate to me that in an effort to expand this
24 process and expand disposal, they selected two good
25 locations that they felt they had good information on

1 as well as the potential for more disposal on the same
2 areas. So I guess it -- choosing two different types
3 of examples was good.

4 Q And one of the other bits of information or
5 testimony that we talked about yesterday was the fact
6 that Chevron has operated self-control over both the
7 SWDs and their oil producing wells, which seems like
8 an additional benefit to the pilot project. Do you
9 have an opinion on that?

10 A The only thing I would say to that is yes,
11 that is beneficial for Chevron in its position. But
12 again, our application will be to other operators who
13 have absolutely no deduction history, that the
14 midstream are not -- that. And so what we can take
15 from this and provide as a criteria for those who are
16 barely in the market for disposal is it's beneficial.

17 Q So would you say that Chevron's role has
18 been sort of managing both SWDs and the producers will
19 then give the Division additional information? It can
20 deploy when faced with applications from operators who
21 aren't the -- situated?

22 A We can try and see. Again, the relationship
23 of having an operator whose vested interest has
24 continued the production is much different from an
25 operator whose barely metering water going down.

1 Q Earlier in your testimony you discussed the
2 0.2 pressure limitation and it's your understanding
3 that's what Chevron is proposing here?

4 A We may have opportunities. The first --
5 most prominent end role we have is pressure limit. So
6 yes, pressure equals -- so --

7 Q So the fact that Chevron is proposing 0.2
8 PSI but is consistent with the OCD's requirements; is
9 that right?

10 A -- every permit that we admitted
11 administratively approved under our primacy is at 0.2
12 PSI for --

13 Q Earlier today, you were asked about DFIT.
14 And you indicated that it would -- could be beneficial
15 for the OCD to consider including that as a test in
16 the administrative application checklist?

17 A Correct.

18 Q Are you familiar with DFIT tests yourself?

19 A Yes.

20 Q Is it your understanding that a DFIT test
21 injects less -- a minimal amount of water for the
22 test?

23 A It is a different test, and it does provide
24 a better accuracy as far as the formation -- so no, we
25 have no concerns. Is it substitutable? I mean, can

1 you replace an SRT with it? That's something we can
2 discuss, but definitely having seen it and the
3 enhanced recovery side we're confident in its results.

4 Q Great. And the Division doesn't see any
5 concerns with the DFIT test in and of itself?

6 A Well, no. Just as long as we do it right.

7 Q Thank you.

8 One thing that you mentioned in your
9 testimony is the need for a complete and robust
10 application. Application materials. And when you
11 were speaking, you mentioned that Chevron has met a
12 lot of the OCD's expectations for applications and in
13 some cases, exceeded that.

14 Is that a fair refresher of what you said
15 earlier today?

16 A I think Chevron does provide accurate and --
17 and good application.

18 Q And Chevron -- you heard earlier or
19 yesterday that Chevron is supporting industry
20 collaboration in this process, which would be
21 beneficial in my view for the Division. But how do
22 you view that?

23 A I have no opinion on that.

24 Q How about -- do you have an opinion on
25 whether industry collaboration with the OCD is

1 beneficial?

2 A Well, we always -- every process we've
3 gone -- we have gone to industry to get at least a
4 snapshot and a position and the opportunity for
5 additional means to identify problems and resolve
6 them. So no, that's -- we've always had that.

7 Q You also mentioned that having a pilot
8 project is not uncommon to establish a record and to
9 establish a path forward for the Division and the
10 Commission?

11 A Right.

12 Q And -- that the -- what learnings from the
13 pilot project can then be -- benefit the OCD and the
14 Commission by providing I guess like stepping stones,
15 providing sort of -- or information that you can then
16 incorporate -- the Division can incorporate for
17 guidance as it moves forward?

18 A Not only that, but the foundation for
19 the -- I mean, we do have this debate about policy and
20 practice. Yes, we don't, yes, we do. And we use the
21 Commission's findings as a means to show this vocation
22 for either a requirement for information or some sort
23 of testing or monitoring as part of the permitting
24 process that we may have moved administratively to the
25 judge.

1 Q That would -- I found the discussion of
2 Exhibit 11 to be particularly helpful because that is
3 a checklist for administrative applications. Was that
4 the intent of it, Exhibit 11? Is that a fair
5 statement to --

6 A It was a fair statement to provide a
7 basement level of what we're looking for in DMG.

8 Q Earlier in your testimony you mentioned that
9 the Division's goal is -- or not goal, but desire is
10 to have good wells with long injectivity lifespan. Is
11 that fair?

12 A -- we look at utilizing the resources of --
13 space -- we will have a real authority. The permit
14 does have to comply with the statute. We do it so we
15 get better results as far as using resources, so it --
16 it goes hand in hand.

17 Q Would you agree that based on testimony that
18 you've seen from Chevron yesterday and their exhibits
19 that Chevron is also dedicated to having successful
20 wells?

21 A We never said they weren't.

22 Q No, no. I'm not -- I'm not trying to attack
23 you. I'm just --

24 A No, I -- the effort by Chevron is admirable,
25 and they are putting together something in support of

1 their operation what I'd expect out of a business that
2 wants to move forward and -- and continue with
3 expansion of their operation. So yes.

4 Q Great.

5 A Is this a Chevron commercial?

6 A Well -- if we were --

7 MS. HARDY -- sponsoring -- by the
8 way --

9 BY MS. BENNETT:

10 Q I think that might be it. I guess in
11 conclusion, it seems to me that the -- one of the take
12 aways from today and yesterday is that there's been an
13 evolution in thinking, not just with operators but
14 also with the Division given the need for additional
15 disposal options; is that how the Division is looking
16 into it as well?

17 A Well, no, I -- we knew this was coming, so
18 the -- realize the push the Devonian that's identified
19 in '83 in our primacy. The concern and use of the San
20 Andres was also identified in '83. We've gone to
21 other locations in other horizons.

22 Devonian has its place and does not
23 adequately meet -- support which is necessary for
24 disposal. I think this breather we've had with the
25 Delaware Mountain Group is not only reflective of our

1 change in how things are done, especially when we were
2 issuing permits with the smallest amount of
3 information.

4 I think also it represents a big change in
5 the industry too with the horizontal drilling and
6 what's coming out of the that. So to meet that need,
7 we knew we were coming back to the Delaware Mountain
8 Group. We just needed to know how to do it without us
9 sacrificing our demands under our statute.

10 That's the thing about it, we may have
11 agreement between operators on how to do something,
12 but it does not take us out of the prevention of waste
13 and the protection of correlative rights. -- waste --
14 waste.

15 Q Thank you. Those are all the questions I
16 had.

17 MR. FUGE: Ms. Hardy, do you have any
18 questions?

19 MS. HARDY: I do have a few.

20 CROSS-EXAMINATION

21 BY MS. HARDY:

22 Q Hello, Mr. Goetze.

23 A Hello.

24 Q A few questions for you.

25 A Thank you.

1 Q Regarding OCD Exhibit 11. This is the --
2 conditions. On paragraph 1A, is it correct that a
3 hearing will be required for applications to inject
4 into the DMG within the NMOGA RA?

5 A At this point, that is how we would probably
6 handle this. Since administratively, we do not have
7 resolution. We would like to go back to NMOGA and --
8 there is an effort to review the map as it was
9 originally presented. So this is an ongoing thing.

10 But I think we need a little bit of a
11 breathing room if we're going to do it
12 administratively; that we have things in place where
13 we know we have concerns for compromise and of
14 resources. So yes, it leads to a hearing process.

15 Q Regarding paragraph 2B, is OCD
16 distinguishing between the upper and lower Brushy
17 Canyon?

18 A I think that has to be handled on a case by
19 case basis, but yes, if I -- reference with the -- of
20 the Brushy as much as you can. And with that using
21 the Brushy, the upper Brushy as a sort of a safety
22 zone and it's very much excluding what has
23 historically been production, which is the lower
24 Brushy.

25 Q One of Mewbourne recommendations which I had

1 mentioned in my opening statement is for OCD to work
2 with the NMOGA DMG Disposal Capacity Reexamination
3 Work Group to create a DMG type log as dry -- cross
4 sections to ensure consistent DMG layer picks across
5 the basin. Is that something OCD would consider?

6 A We would consider, and the -- we also have
7 plans to work with the Bureau of Geology -- the Bureau
8 of Geology, we currently have a task agreement with
9 them that they assisted us in the Delaware Mountain --
10 I mean the Devonian projects. We were also looking to
11 them to assist us in Delaware Mountain Group.

12 Q Mewbourne has also recommended that OCD
13 consider the requirement to perform a new step rate
14 test any time the tubing diameter of the well is
15 upgraded or if additional DMG preparations are added
16 below the current disposal purview -- interval.
17 Sorry. It's been a long day.

18 Is this something else that you would
19 consider including in Exhibit 11?

20 A Currently our step rate tests are
21 conditional, meaning that if you change -- move the
22 packer; you change the tubing size; or if you've added
23 a corporation -- whole configuration's different from
24 the original test, then you have to run another test.
25 So we would -- that through.

1 Q There seems to be a misconception in the
2 industry that it's being banned all new DMG SWD
3 permits after the creation of the NMOGA map to the
4 Exhibit G.

5 Can you confirm for the record that OCD
6 never approved rules to ban those new DMG SWD permits?

7 A No, we did not. Many of the applicants when
8 asked to provide additional information withdrew their
9 applications. So -- and in some cases the companies
10 dissolved before the permitting -- so --

11 Q Regarding OCD Exhibit 8, we're looking at
12 pages 12 and 13.

13 A Yep.

14 MR. FUGE: Mr. Tremaine, can you bring
15 up that exhibit?

16 MR. TREMAINE: Yes.

17 BY MS. HARDY:

18 Q Those pages appear to address -- a more
19 similar case to that -- made by Chevron at page 121 in
20 their exhibits. And I can actually show that to you.
21 That would be --

22 MR. FUGE: -- because I --

23 BY MS. HARDY:

24 Q Do you know about the -- this is the --

25 A Yes, I -- have --

1 Q Chevron Exhibit? Okay.

2 Chevron attributed interference between two
3 DMG SWD wells and an Avalon producer to lineaments for
4 faults. Are you familiar with those two SWD wells
5 that are shown on Chevron's exhibit -- page 21?

6 A See down there near the Papa Squirrels. No,
7 I -- I probably know -- where they are, but -- but I
8 have not looked at them in detail.

9 Q Okay. And what is your opinion regarding
10 whether DMG -- SWD wells be enhanced to find presence
11 of faults or lineaments?

12 A This is something that weighs heavily with
13 regards to the characteristics of the -- the
14 reservoir, yes. Again, I've had actual water floats
15 north of the Avalon and canyon area where -- canyon
16 area where Delaware Mountain Group injections from SWD
17 wells has been observed by water flow a mile away.

18 So it was indicated by the operator that
19 there was a fracture -- but it was never disclosed
20 until the additional of new -- new injection models.
21 So yeah, it -- it is a heavy item to consider and of
22 course, the ability to get that information is
23 critical. Will we get it? Again, that we don't know.

24 Q And could the potential of that relationship
25 be used as a monitoring tool for potentially

1 problematic wells in the future as more wells are
2 drilled?

3 A Yes. It would be -- and again, I think this
4 is the Division moving from its well by well approval
5 process, that if we do have an operator in an area
6 that we become more familiar with it. Certainly we
7 would have less hesitation if we knew more about it
8 but if we find concerns -- find issues that it does
9 impact other wells in the area, then we would
10 certainly look towards saying that this is not a
11 confirmed area for DMG injection.

12 Q Those are all of my questions. Thank you
13 very much.

14 A You're welcome.

15 MR. FUGE: Dr. Ampomah?

16 DR. AMPOMAH: -- now I feel a little --
17 yeah. So thanks so much for your testimony because
18 you've clarified a lot of things. At least for me, but
19 I do have a couple of questions.

20 Now, with regards to this pilot
21 project, does OCD understand the time line for this
22 pilot project?

23 MR. GOETZE: We have in the past put
24 the limitations on the pilot project in the sense we
25 would say in so many years, we'll keep this in place.

1 This Commission reporting back Commission, but we'd
2 still go ahead and issue our standard permit, but at
3 that point, we would release the requirements for
4 Commission hearing and maybe do something more aligned
5 than just a summary to the Commission.

6 So there -- there are opportunities
7 with the Commission to lay out and amend -- they would
8 have to come back and report to you as well as us.
9 And then at that point, decision by Commission is no
10 longer needed and we can move on with something else.

11 My recommendation to use our UIC
12 template allows us to incorporate a lot of the
13 necessary recording information and the condition for
14 inspection, changes to the permit, these sort of
15 things that are customary for all our class 2 wells --
16 disposal wells.

17 Unlike the acid gas wells, where we
18 have that long document with the -- the order and the
19 conditions in that order, we could do the same thing
20 of combining our -- our existing template along with
21 the direction from the Commission to have a
22 reappearance and present the results of the
23 investigation.

24 MR. AMPOMAH: So with that information,
25 because I didn't get it all -- information through the

1 presentations throughout -- then I will see --the
2 Commission, are you going to work with the Commission
3 to come up with that?

4 MR. GOETZE: What we would be asking
5 the Commission to do is sanction and say this is a
6 good process and the Division should follow it.
7 With -- this is why we have the acid gas wells coming.
8 Because we were -- member -- the same amount of
9 information requirement to work for an early disposal
10 well.

11 And it was quite clear it was not
12 sufficient with regards to how these wells and in
13 actual their longevity and what they inject. And so
14 we, kind of, based upon that approach that for now the
15 Delaware Mountain Group -- if we're going to ask the
16 conditions on permit we'd ask the Commission to say
17 yeah, these are good.

18 And -- and presenting in the case of
19 Chevron coming and providing the summary board or
20 results and we would be again, the same and give our
21 opinions on those results on a two year case or every
22 two years for ten years or what -- that we would be
23 able to have you at some point save level confidence
24 in what we have in place is good, and the only time we
25 come back to visit you is if we got a problem and we

1 see that we're not really sufficiently adequately
2 buying resources.

3 Otherwise, we run into this problem of
4 we can ask for things, but legally, we are bounded by
5 what's already in our New Mexico administrative code.
6 And so our concerns are we don't want to put every
7 single thing -- because that limits us. The
8 requirements for casing designs and things like that
9 are -- are done through approval of API standards
10 and -- industry understood.

11 And same thing is true with this. When
12 we do our acid gas, we usually have the redundant
13 wells administratively, though we use the guidance
14 that was given to us in that original order that also
15 applies to that administratively approved second
16 realm.

17 So our concept was to go forward with
18 Commission and say what are we going to ask for in the
19 Delaware Mountain Group and what can we bend forward
20 and say -- someone comes in and wants just
21 administratively approval, these are the things we can
22 do. And we don't get a lawyer saying no, you can't do
23 that.

24 MR. AMPOMAH: So -- first condition
25 approval, is it one that's been -- approval?

1 MR. GOETZE: We can include that and
2 whatever -- wants to --

3 MR. AMPOMAH: So -- in terms of the
4 condition that this is going to establish in support
5 the pilot project, is there some guidance of the
6 Commission asking --

7 MR. GOETZE: I -- we could --
8 historically -- have been able to tell the lawyers --
9 but I think what I would like to do is -- is go
10 through the UIC permit, add the conditions of
11 approval, and slap them on the back of an order, which
12 we do already.

13 And that Commission order gives the
14 guidance of coming back and saying all this permit we
15 put together, come back in two years, and give us the
16 results of this, and the Division will fill up and --
17 will fill up and we'll find out what's working what's
18 not working.

19 At that point, you could say come back
20 in another two years, but my concern is that again.
21 As soon as word's out that Chevron has a pilot
22 project, you folks are going to be busy. And I don't
23 think that's what we want to do.

24 I think what we want to do is get it
25 into a process that even at Division hearing level we

1 can say look at the Commission decision, and this is
2 what we want or as administratively permit comes into
3 us in the office. We find all this information and
4 we're comfortable enough to issue a permit for what
5 they're asking for.

6 MR. AMPOMAH: Thank you. Okay. Let's
7 talk a little bit about the 0.2 and then also the --
8 so Chevron -- had, you know, they presented out the
9 analysis. For my opinion, it's -- I'm trying to
10 relate that to let's say the current location which
11 I -- some feel issues with that.

12 But based on your testimony, you say
13 that you are mostly interested in the 0.2 more like
14 the pressure -- so are you saying that you feel
15 comfortable with Chevron -- 20,000 for one well and
16 then 15,000 for one well?

17 MR. GOETZE: At this point, the
18 individual permits will be based on pressure at the
19 individual well. The 0.2 is -- are administratively
20 approved. So that's the -- the administrative
21 limitation that we're placing on it.

22 Now, the opportunity of a step rate
23 test in front of that will give us a greater level of
24 understanding of what the formation or DFIT of what
25 conditions in the reservoir are. We normally look at

1 that absolute volume injection as a best estimate and
2 not necessarily a permit condition, but under our
3 rules currently, the pressure -- maximum surface
4 injection pressures what decides the volume going
5 down.

6 MR. AMPOMAH: So the Commission doesn't
7 need to worry about --

8 MR. GOETZE: I -- I think what we tend
9 to see is that it's the best guess for the situation
10 because we don't know what they're going to encounter
11 downhole, certainly not all drillers are good.

12 MR. AMPOMAH: So you talked about --
13 there are some few fractures that based on previous
14 statements -- DMG -- now, but if you look at the
15 Exhibit 11. I don't see any tool that you have in
16 there, and so number four, for example -- number
17 four -- in terms of the testing and monitoring
18 procedures.

19 I know Chevron is going to be --
20 definitely we're going to use that to prove that there
21 are no fractures here and there.

22 So is the OCD going to consider if
23 fractures is a problem would the -- let's say -- the
24 two, like -- combine -- two also together --

25 MR. GOETZE: We would certainly adopt

1 that with any. No problems.

2 MR. AMPOMAH: Okay.

3 MR. GOETZE: But again, our position's
4 that we have -- industry and with regards to operators
5 such as Chevron or Mewbourne, they're willing to make
6 the investment. Our problem will be willing to those
7 in -- applicants who will not be interested in that
8 type of thing.

9 And so if the Commission sees that --
10 we -- the more information we have, certainly the
11 better we're able to characterize and make a decision.

12 MR. AMPOMAH: So that is something the
13 Commission can also add to?

14 MR. GOETZE: Yes, you may add -- you
15 may add as many things as you wish.

16 MR. AMPOMAH: You made mention of --
17 let's say once we approve this application there's
18 going to be a volume of applications coming through?

19 MR. GOETZE: Correct.

20 MR. AMPOMAH: Now, I'm sure -- the same
21 thing applies to the AGI wells where -- instead of
22 approving they're -- applications coming through. And
23 then there you -- so I'm a little bit concerned
24 about -- let's say -- presenting these complex
25 projects and then a lot of different projects coming

1 through without really thinking about what -- take
2 into consideration the cost and operations, you know,
3 to help us to more or less look into the future.

4 So is this something that the OCD's
5 looking at --

6 MR. GOETZE: So that's why we're
7 probably going to have to solicit outside sources.
8 For instance, you've heard of scissors and their
9 support of the seismic issues and putting together a
10 cooperative. I don't imagine us being that good to be
11 modelers and experts in that. So yes, we will have to
12 seek a support mechanism in that sense.

13 MR. AMPOMAH: Well, so you do have
14 their support somewhere somehow because you do have --
15 so you normally use -- you use Bureau of Geology for
16 most of your -- work. Why not use PRC for some of
17 the -- work, because that's what we do?

18 MR. GOETZE: Yeah. No, no. I --
19 there's a variety of sources and -- and -- what we
20 would do is probably look for something in the
21 educational system, whether we'll say U&M. But, you
22 know, things along --

23 But yes, we -- we have -- and I -- this
24 is something we've lost over the years. We used to
25 use the Bureau for more information, especially in the

1 earlier years of what -- asked about. We only have
2 recently returned, especially when we saw the
3 information coming in the Devonian block. For us to
4 know if the permitted -- hole was really what was
5 being injected into, we had to have a third party.

6 In this case, the group at the Bureau
7 come in and map for us what is truly being seen on the
8 logs. And therefore, our side for the compliance
9 issue saying, yes, they are completed in that interval
10 is satisfied. And also, because we had very limited
11 information, again, going to a third party to compile
12 that information and using it as a basis for our
13 decisions is going to be critical.

14 We do the same with seismic. We're not
15 seismologists, and certainly we required industry's
16 input is important, and we relied upon them to give us
17 their information and understanding -- modeling
18 complex. So it's not just going to be us in the back
19 room looking at bottles and saying yes or no. It'll
20 be in a relationship, kind of.

21 But again, this brings us to the other
22 consideration. If I have an application from a ma and
23 pa operation, then we're going to see this thing of
24 well, you're denying us the business and I don't see
25 that being much of an issue, but I do see that we're

1 going to have to have more cooperation and better
2 understanding, especially with modeling coming in.
3 But we're going to need some assistance.

4 MR. AMPOMAH: You make mention about
5 the way Chevron presented the application in such a
6 way that the Lamar and then also the lower formation
7 is a little bit of a problem.

8 But I want a clarification though
9 because it shouldn't -- the system -- must be a
10 storage complex where they have to clarify where they
11 are when they choose. And I think that is what they
12 did. So I was a little bit confused. So if you could
13 clarify that?

14 MR. GOETZE: Under the UIC rules, what
15 you're asking for is an interval for injection
16 into -- so realistically, it would be from the
17 base -- say for reasons of discussions, the base of
18 the Lamar to some sort of permeable barrier that they
19 identify in the upper Brushy. The confining layers
20 are not included in the injection interval.

21 And so when we write that permit, we
22 say that that's the injection interval, and then we
23 have a rule that says if it gets out and we say it has
24 to stay in that injection interval. Once it gets out
25 of it, then you're in violation of that permit

1 condition and then we have to revisit.

2 So our compliance is that okay, you're
3 inside that interval, fine. But if in certain cases I
4 had a well that was in the southeast DMG, it went down
5 the top of the Brushy. We ran a Spinner on it. And
6 99 percent of the fluid was going in the bog 50 feet
7 of a -- a 700-foot well. So we know where it's going
8 below what was permitted.

9 And then we have to revisit those
10 people and say either this permit's got to go, or you
11 got to show us you're not impacting the end, outside
12 of your confining layer.

13 MR. AMPOMAH: Okay. I think I'll end
14 here. Thank you.

15 MR. FUGE: Mr. Bloom?

16 MR. BLOOM: Better have a few more in
17 you, Dr. Ampomah.

18 DR. AMPOMAH: I want -- to talk to me.
19 So I --

20 MR. BLOOM: Thank you, Mr. Goetze, for
21 your testimony today. I'm not quite sure where to
22 begin here, but let's at least go to Exhibit 11 2C.
23 The criteria for selection of injection interval.

24 We see here application should include
25 a review of the AOR. Assessment for evidence of

1 natural fracture systems or faults. I'm not familiar
2 with the D-108.

3 Is there a specified distance or radius
4 of the AOR or is that something that you negotiate
5 with the applicant, Mr. Goetze?

6 MR. GOETZE: Under our primacy
7 agreement, all states -- all states have to declare --
8 there's -- there's two ways of doing it. Either it's
9 a static distance area of review or there's a formula.
10 And remembering that UIC rules are five -- states,
11 whatever fits your program best is what's selected.

12 The Division chose to go with a
13 stagnant one half mile radius if we do. And it has
14 been successful up until now. One of the reasons we
15 had gone to hearings was that the Devonian wells is
16 because of the fact we felt that it was going to
17 exceed that one half mile. It had been, shall we say
18 through usage used as a type of spacing.

19 Typically what happens is that if
20 someone has an SWD within that one-half mile radius,
21 it -- it ends up being in a protested application. So
22 it has been a matter of convenience to exclude any
23 other disposal actions that are in the same interval
24 in that half mile AOR.

25 MR. BLOOM: I'm going to jump around a

1 little bit. The OCD in its pre-hearing statement said
2 that, "OCD neither supports nor opposes the
3 applications. Current knowledge of DMG for the
4 selected locations or require any UIC permits to
5 incorporate the additional conditions provided in
6 Exhibit 11."

7 Mr. Goetze, are you comfortable with
8 the two-mile AOR here?

9 MR. GOETZE: We'll take as much
10 distance as we can get. I think it's frugal. Will it
11 stand? We'll find out. I mean, that's one of the
12 reasons of doing the testing. It may be in some areas
13 if you want to -- want to utilize the Delaware
14 Mountain Group in that area, that -- that will be a
15 necessity.

16 But there may be areas where the rock
17 and the formation again, looking at the Nance paper
18 and the uniqueness of the deposition, there might be
19 areas where closer is -- is practical and acceptable
20 if the information supports that.

21 MR. BLOOM: Thank you. Dr. Ampomah
22 asked a little bit about where this -- sort of where
23 this heads, what the process looks like for subsequent
24 applicants for the DMG? I know I might be getting
25 into OCD territory a little bit here, but it helps me

1 think about how we deal with the case in front of us.

2 In the long term, do you see a special
3 C-108 application for the DMG or how does that -- how
4 do you envision that?

5 MR. GOETZE: No, I see a change in the
6 108 entirely if we're going to do disposal. I think
7 the fact that we have something that dates back to
8 2000 and -- does not represent current status of
9 necessity for disposal and making sure that it happens
10 right, we've always asked -- we've always in my
11 requirements. But we are seeing the demand that we
12 know more about it in order for us to issue a permit
13 than --

14 MR. BLOOM: I believe I reviewed
15 everything. With all the materials that -- were
16 presented to us and I'm trying to reflect on what
17 we've heard since yesterday. It feels like a long
18 time ago that we began.

19 I'm a little unclear how we wind this
20 up today or where we go, and I don't know if you can
21 speak to that or, you know, some combination of maybe
22 OCD and Chevron speaking to this or if our chair would
23 have thoughts, but are we looking for an order here at
24 the end or an instruction to the OCD to evaluate? I
25 don't know if you have any thoughts on this. We're

1 asking the right person, so --

2 MR. GOETZE: I think you can go either
3 way. I think giving us direction to approve what they
4 provided and do it through a permit that the director
5 signs on behalf of the Commission is a possibility.
6 We would use our standard template plus whatever you
7 put into the conditions of the order and then
8 stipulate, you know -- years going back, talk to us.

9 MR. BLOOM: Okay.

10 MR. GOETZE: And tell us how it's
11 working. I think that's practical. And I think also
12 gives us the opportunity to -- if we're going to
13 again, do administratively, that gives us the
14 opportunity to figure out what the language should
15 look like.

16 Does that mean we have to provide you
17 an example of what we're going to issue? That would
18 be up to you. If you want to see what the final order
19 looks like, and the -- tell us to write one and -- and
20 take whatever they want put in and whatever we want to
21 put in. I think we can negotiate something and then
22 provide a -- a result.

23 MR. BLOOM: Would OCD be okay if we
24 asked it if Chevron and OCD came back with the first
25 year of operations and asked for a report?

1 MR. GOETZE: Oh, sure. I mean, if you
2 want to increase the frequency, the better it is for
3 us.

4 MR. BLOOM: And perhaps do you -- every
5 couple years after that -- it looks good?

6 MR. GOETZE: Because again, remember,
7 you're going to be giving us the guidance that we will
8 take, walk out, and put it in another permit. So --
9 leave it forewarned that permits are at the gate. The
10 better and faster and the more consistent we have it
11 up front, certainly we'll be in a better position.
12 Especially since you folks are going to be involved,
13 you'll be able to see that information also.

14 MR. BLOOM: That's what I was thinking
15 about. Okay. I appreciate that thought. I don't
16 believe I have any further questions.

17 MR. GOETZE: And we've not forget
18 mister --

19 MR. BLOOM: Be happy that he's
20 listening in today. So thank you.

21 No further questions at this time.
22 Thank you.

23 MR. FUGE: I have no additional
24 questions for the witness, and we're covered. So
25 unless there's redirect, Mr. Goetze, you're excused.

1 DR. AMPOMAH: I have one more.

2 MR. FUGE: Oh. You didn't get up
3 that -- no. Mr. Goetze --

4 DR. AMPOMAH: -- identifying this one.
5 So Chevron showed a plot of how much water is actually
6 being produced, you know, compared to how much is
7 actually injected in the vesicle. That is really an
8 alarming plot because it sounds like you have a lot of
9 water than we more or less can send to Texas.

10 So what is the OCD really doing about
11 this?

12 MR. GOETZE: Well, now you're getting
13 into state politics.

14 MR. AMPOMAH: Oh, no --

15 MR. GOETZE: I mean, this is one of the
16 problems of considering the Permian Basin is between
17 two states with two sets of rules that are different.
18 So limitations that we have, for instance, we have the
19 waste isolation pilot project. Having injected around
20 there with Delaware Mountain Group, we -- we finally
21 got away from it because Department of Energy doesn't
22 want to see it.

23 The ongoing consideration that yes, a
24 lot of the operators are sending water to Texas
25 because of the fact the DMG injection is quite

1 favorable to them because they are not restricted by
2 correlative rights. They're not restricted by what we
3 had as limitations on injection structure.

4 And so there will be at some point and
5 already has been in the Texas legislature to put a
6 surcharge on water coming from New Mexico in the hopes
7 that it stays here. So yes, there will be a -- a push
8 for shallow injection and it will be coming to our
9 doorstep fast because that is growing.

10 That distance between disposal and what
11 is out there and needs to be disposed of the capacity
12 versus what's being produced is still expanding. But
13 then again, this is where we're looking at multiple
14 development. And Devonian has its issues, and it does
15 have limitations. And this is one of the papers that
16 was done by Dr. Scanlon with the Bureau of Economic
17 Geology is that OCD is going to have to look at this
18 as a whole basin issue.

19 And so the operators cooperating, or
20 they are willing to cooperate and work together to
21 have multiple sources of disposal. So I mean, there
22 are areas of looking at breaking up this disposal and
23 still meeting the capacity, but the biggest problem
24 gets to be is that historically, we've all learned of
25 the same location at the same time.

1 And as a result we can look at the
2 problems. And to point out that this is not the only
3 issue here. And with -- we have a -- methane. We
4 have a decent seismicity up there and all that water's
5 coming from Colorado. So we share a lot.

6 MR. AMPOMAH: Thank you. Thank you,
7 sir. Okay.

8 MR. FUGE: You are now excused. Yes.

9 MR. GOETZE: Thank you.

10 MR. FUGE: Mr. Tremaine, do you have
11 another witness?

12 MR. TREMAINE: We do. OCD would call
13 Million Gebremichael.

14 MR. FUGE: And I would just state,
15 unless there are objections here, Mr. Gebremichael has
16 appeared before the Commission this year accepted as
17 an expert in other things.

18 Unless there are concerns about his
19 qualifications or you are offering him for a different
20 purpose than he was previously qualified, propose that
21 we just allow him to testify without a customary, kind
22 of, background introduction, if parties are
23 comfortable.

24 MS. BENNETT: We would be comfortable
25 with that. Thank you.

1 MR. TREMAINE: Yeah.

2 MR. FUGE: Mr. Gebremichael -- may I
3 ask the court reporter to swear the witness in?

4 THE REPORTER: Please raise your right
5 hand.

6 WHEREUPON,

7 MILLION GEBREMICHAEL,
8 called as a witness and having been first duly sworn
9 to tell the truth, the whole truth, and nothing but
10 the truth, was examined and testified as follows:

11 MR. FUGE: Please have a seat, sir.

12 THE WITNESS: Thank you.

13 DIRECT EXAMINATION

14 BY MR. TREMAINE:

15 Q Good morning -- almost afternoon now, Mr.
16 Gebremichael.

17 A -- I see that.

18 Q Could you please state your name for the
19 record?

20 A Yeah. My name is Million Gebremichael.

21 Q What is your current position with Oil
22 Conservation Division?

23 A Well, I'm a petroleum specialist advanced
24 with -- OCD for the Underground Injection Control
25 Group.

1 MR. TREMAINE: I'm going to stip here
2 noting the Commission's acceptance of Mr. Gebremichael
3 as an expert in the areas of petroleum engineering and
4 underground injection and move the Exhibit OCD number
5 3, which is the curriculum vitae of Mr. Gebremichael.

6 (OCD Exhibit 3 was marked for
7 identification.)

8 DR. AMPOMAH: Yes.

9 MR. FUGE: Any objections?

10 MS. BENNETT: No.

11 MR. FUGE: Admitted.

12 (OCD Exhibit 3 was received into
13 evidence.)

14 BY MR. TREMAINE:

15 Q All right. Skipping over education and
16 experience.

17 Mr. Gebremichael, could you please provide a
18 brief summary of your testimony today?

19 A My testimony today would be focusing on
20 Exhibit 12 and then also Exhibit 11, item number 4.

21 I'll explain more and answer any questions
22 in regard to the conditions of approvals that were
23 made in regard to the well testing, like the step rate
24 test, which is commonly known as SRT or follow-up test
25 in order to determine the right maximum allowable

1 surface injection pressure.

2 Also, once -- injection also monitoring a
3 well in order to make sure that the inject state or
4 the fluid injected space was in the intended zone, so
5 they don't infringe upon the correlative rights.

6 Q Okay. Mr. Gebremichael, have you reviewed
7 the applications submitted by Chevron is the case
8 today?

9 A Yes.

10 Q And when you review applications for
11 disposal wells, in general, what are you reviewing
12 for?

13 A Generally, what I review is the
14 administrative completeness of the application and
15 then we'd do a technical review of geological and an
16 engineering standards to ensure protection of the
17 correlative rights, prevention of waste, and the
18 protect -- prevent -- protecting the environment.

19 Q And you mentioned OCD Exhibits 11 and OCD
20 Exhibit 12 -- talked about momentarily.

21 Are you familiar with and participate in the
22 recommendations included in those exhibits?

23 A Yes.

24 Q And at a summary level, is it your
25 professional opinion that you support these conditions

1 of approval and that they're necessary for the
2 protection of correlative rights and prevention of
3 waste?

4 A Yes.

5 Q Specifically, I'd like to direct you to
6 Exhibit number 12, which is up on the screen right
7 now.

8 (OCD Exhibit 12 was marked for
9 identification.)

10 Does this Exhibit show OCD's proposal for
11 separate test deadlines?

12 A Yes, it does.

13 Q And why doesn't OCD require a permittee to
14 conduct --

15 MR. FUGE: Mr. Tremaine, sorry for the
16 interruption. Can you have the witness -- or -- the
17 witness clarify is this -- was this guidance developed
18 specifically in response to this application or is
19 this a standard guidance provided for these types of
20 tests by OCD?

21 THE WITNESS: This is standard guidance
22 for all the SWD wells.

23 MR. FUGE: Okay.

24 MR. TREMAINE: Thank you.

25 BY MR. TREMAINE:

1 Q Mr. Gebremichael, why -- in general
2 application, when do SRT tests occur for SWDs?

3 A Well, generally -- OCD requires an SRT when
4 the well already commenced injection after building up
5 some kind of pressure it would apply for what we call
6 IPR, increase for injection pressure increase. Then
7 we would require them to conduct an SRT.

8 And then based on the result of the SRT,
9 whatever that pressure -- pressure gradient that we
10 got with some -- some application of some safety
11 factors and that would allow them, and we would award
12 them with the new maximum allotment -- service
13 injection pressure.

14 Q Okay. So then to clarify on chair's
15 questions, this is -- this guidance is a general
16 applicability and generally speaking SRTs are required
17 by OCD after the injection's commenced and when
18 certain changes are made to the well?

19 A Exactly.

20 Q Okay. In this specific case, is it true
21 that OCD is recommending commencement of an SRT test
22 prior to commencement of injection?

23 A Yes.

24 Q Okay. So while this Exhibit 12 is generally
25 applicable, OCD is recommending based on the facts of

1 this case that SRTs are required prior to commencement
2 of injection. So it's an additional requirement to
3 beyond what's discussed --

4 A That's true.

5 Q Okay. Thank you for that clarification.

6 So why specifically does OCD recommend
7 requiring Chevron to conduct an SRT on the injection
8 interval formation prior to commencing injection?

9 A Well, the reason is given the historical
10 occurrence of infringements or impairing of
11 correlative rights in the DMG zone. OCD believes that
12 having conducting SRT prior to commencement of
13 injection would give us a good picture.

14 And the -- the -- pressure and then with our
15 conditional some safety factors. So we have a good
16 start that we are applying the right maximum allowable
17 surface injection pressure that would contribute to,
18 you know, protecting correlative rights.

19 Q Can you explain to the Commission how you
20 referenced this in a general level previously, but
21 how -- the information that's gathered from a separate
22 test is used to set or change permitted injection
23 pressure?

24 A Yes. So generally speaking, OCD
25 administratively, we award operators or permittees the

1 0.2 PSI gradient. But in this case, a DMG, like I
2 stated before, even the heterogeneity nature of
3 the -- or the complexity nature of the reservoir and
4 the past occurrence of infringement of correlative
5 rights, having that prior knowledge would, you know,
6 would -- would contribute to or assigning that
7 pressure in full increments injection would help us to
8 assign -- okay, this is what your maximum allowable
9 pressure is going to be with an application of safety
10 factor.

11 When we talk about safety factor, can be 5
12 percent; it could be 10 percent, based, you know, what
13 kind of tubing size they're using; what type of tubing
14 length they're using; or the ability of the reservoir
15 based on those, you know, kind of, friction loss
16 involved. We can award the -- the right maximum
17 allowable pressure and then in that case, that makes
18 us confident that, you know, the correlative right is,
19 you know, protected.

20 Also, from Chevron's presentation, I learn
21 that DFIT, or in other places they call it a mini frac
22 test. Collaborating both the SRT test result, the
23 mini frac test result, that would put us in a good
24 position to assign the right maximum allowable surface
25 injection pressure.

1 Q So despite the fact that administratively,
2 OCD would typically approve a 0.2 PSI -- injection
3 criteria and apart from that based on SRT.

4 Because of the issues that have been
5 identified and history of interference and the
6 heterogeneity of the injection zone, in this case, is
7 it true that OCD would be getting that information up
8 front and then would reassess that maximum injection
9 pressure based on that test?

10 A That's true.

11 Q One moment.

12 A yeah.

13 Q Mr. Gebremichael, we jumped into my
14 questions here, so I just want to make sure. I think
15 we've covered everything. Is there anything that is
16 pertinent to the step rate test and the guidelines as
17 applied to these cases that you think that the
18 Commission needs to know?

19 A Yes. For purposes to choose subject wells,
20 we're moving -- injection in both Bell and Cherry
21 Canyons. They're injecting both sample casings in
22 those formations. When we see the SRT plot, we would
23 see an early deflection point. The reason is because
24 they are testing them both at the same time.

25 I mean, some -- may inject -- maybe just

1 Bell formation or Cherry formation, but lately we've
2 been seeing that the permits are coming for both. In
3 that case, OCD recommends to put testing plots
4 separating those two formations and then testing them
5 separately. In that case, we have two separate
6 fracture gradients.

7 And then either one we're going to go with
8 the weakest link, you know, the lowest fracture
9 gradient will cover the surface injection pressure for
10 both formations. In this case, probably that's
11 what -- application -- that I want to bring to
12 attention to the Commission.

13 Q Okay. I want to -- we have Exhibit 12 up
14 here as a standard in front of us, that I want to
15 refer back to OCD Exhibit number 11.

16 A Exhibit 12, yeah.

17 Q And on the second page of that, which is
18 page 158. I specifically asked you about this Hall's
19 plot?

20 A Yes.

21 Q Can you explain the basis of what
22 information OCD is looking for with this Hall plot and
23 how does that, you know, relate with the information
24 that we are discussing with the SRTs and the other
25 tests?

1 A Yes. Well, you do pulse -- is one of the
2 engineering tools that can utilize to have an early
3 warning of the -- if the injecting is, you know, if
4 there's any indication flowing out of the intended
5 stone. So with this, what I -- the early warning I
6 say is in the past -- when you have the infringement
7 you see it on the offsetting while an increase in
8 water gap.

9 By that time, the reservoir's coverage is
10 destroyed, compromised. Exactly. But with this one,
11 what we require, like Chevron maybe future applicants
12 is this -- the Hall's plot is very easy to construct.
13 And then once you go to construct it, even with the --
14 and others there's a light there that's coming in --
15 and once it's constructed, it could be automatically
16 tell you, you know, any deviation from the, you know,
17 there are all three, four lengths in the hall's plug,
18 but I'm going focus, you know, the one that depicts
19 the outer zone injection and then when we see that,
20 and then they could inform OCD, and then we could take
21 appropriate measures.

22 It could be curtailment of correct action.
23 And then it could even be product shedding of the
24 well. So we believe that having a good Hall's plot
25 will help us determine any early -- before

1 infringement of correlative rights.

2 Q So the -- in summary, the purpose of the SRT
3 requirement prior to -- injection is to further OCD's
4 knowledge of formation -- pressure and go get max
5 injection PSI; yes?

6 A Yes.

7 Q And the purpose of the Hall's plot is to
8 help identify any issues or to isolate issues between
9 the two different -- injection zones?

10 A No. No -- it -- you know, the Hall's plot
11 is applied, even if we need water -- so the Hall's
12 plot is basically -- is going to tell us this, you
13 know, the entire injection zone. If we have any
14 deviation, you know, leaving out of this intended
15 zone, it's going to tell us.

16 But what I have seen is more even empirical
17 data is a Chevron has provided -- modeling; right and
18 that would even give us how, you know, the injector is
19 migrating over time, you know. We can collaborate all
20 those things to come up.

21 The main goal is -- here is, you know, to
22 tame it before it compromises the reservoir. Because
23 once, you know, you see an increase in water path,
24 right? Okay. Maybe that old crater is not happy with
25 that. But as far as protecting west the reservoir is

1 already compromised. So this is an early warning or
2 early detection tools.

3 Q Okay.

4 A Yeah.

5 Q Whatever. That was my takeaway here -- was
6 that in combinations should that the accommodation of
7 monitoring and testing and reporting that Chevron's
8 proposed along with the OCD's requirement for the SRT
9 tests -- injection and Hall's plot, together will be
10 in a position where you can identify or may be able to
11 identify potential impacts to the resource prior to
12 the --

13 A Exactly.

14 Q And last question, Mr. Gebremichael: In
15 your opinion, are the conditions in SRT proposals --
16 in OCD -- Exhibits 11 to 12 necessary to prevent waste
17 and protect correlative rights?

18 A Yes.

19 MR. TREMAINE: No further questions.

20 MR. FUGE: The exhibits we introduced
21 before we --

22 MR. TREMAINE: Yes. If I could add --
23 well, Chair, could I please move to the admission of
24 Exhibit 12?

25 MR. FUGE: Any objection?

1 MS. BENNETT: No.

2 MR. FUGE: Accepted.

3 (OCD Exhibit 12 was received into
4 evidence.)

5 MR. FUGE: Ms. Bennett, the witness is
6 yours for cross.

7 MS. BENNETT: Thank you.

8 CROSS-EXAMINATION

9 BY MS. BENNETT:

10 Q Nice to meet you.

11 A Same here.

12 Q I just had a couple of quick questions. As
13 you might have heard from my earlier questioning
14 yesterday, Chevron does have some questions or desire
15 to collaborate with the Division on this step rate
16 test methodology.

17 And in particular, it sounds like to me from
18 your testimony just now that there is some flexibility
19 there, especially with respect to the pre-injection or
20 prior to SRT that you're envisioning prior to
21 commencement of injection.

22 Did I hear that correctly, that there's
23 some --

24 A Flexibility --

25 Q Well, what Chevron's goal would be is to be

1 able to submit an SRT plan to the Division for both
2 wells.

3 A Yes.

4 Q And then work collaboratively with the
5 Division to ensure that that plan meets your
6 requirements but also allows for the unique
7 circumstances that we're faced with today.

8 A That's true.

9 Q Okay. I think that's the only question I
10 have. Thank you.

11 A Thank you, Ms. Bennett.

12 Q Thank you.

13 A You're very welcome.

14 MR. BLOOM: Ms. Hardy, do you have any
15 questions?

16 MS. HARDY: Yeah, just a couple.

17 THE WITNESS: Okay.

18 CROSS-EXAMINATION

19 BY MS. HARDY:

20 Q Hello, Mr. Gebremichael.

21 A Hello.

22 Q I just have a couple of questions for you.

23 A Absolutely.

24 Q Can you please clarify what criteria you
25 were going to use to determine whether a five percent

1 or ten percent safety factor will be applied to the
2 step rate test results?

3 A Yes. Well, like I mentioned earlier, it
4 depends, you know, how much of the friction --
5 pressure friction losses; right? So if there's a huge
6 friction loss, you know, number one it makes it down
7 to the -- to the bottom. Then we tend to compensate
8 for that friction loss.

9 I -- instead of going ten percent, maybe go
10 five percent of, you know, that safety factor. Also,
11 the permeability also plays a role here; right?
12 When -- when you have very tight mobility from a --
13 you will want the friction to be higher than the --
14 the, you know, the tubing friction. In that case, we
15 see the whole picture, you know, working with a five
16 percent or a ten percent, yeah.

17 Because our goal is at the end of the days,
18 how much of pressure is impacting that rock. That's
19 what we -- where our concern was at times. As far as
20 the optimization of the injections, that is the role
21 of the production or injection engineer, making sure
22 to register frictions.

23 Q Thank you. One more question. Can you
24 please clarify if an operator is planning in Bell
25 Canyon, Cherry Canyon estimate to completion and

1 decides not to perform a combined layers step rate
2 test, but decides to perform individual layer DFITs,
3 what DFIT parting pressure are you going to utilize to
4 determine the max injection?

5 A Injection. That's a very good question.
6 See, as we go along with the DMG, the more data we
7 gather -- and then our goal is at one point to
8 establish a regional fracture gradient for the DMG.
9 So do we use SRT, or do we use the mini frac test?

10 In my opinion, the mini frac test is more
11 reliable, but at this time, though, what we're going
12 to do is collaborate both compare and contrast. And
13 then from a Division perspective all go with the most
14 one.

15 MS. HARDY: I'm just going to hold my
16 questions. Thank you very much.

17 MR. FUGE: Dr. Ampomah?

18 DR. AMPOMAH: Yeah, thank you so much
19 for the testimony. A couple clarifications though.
20 So I also had a question on the safety factor.

21 MR. GEBRMICHAEL: Yes.

22 MR. AMPOMAH: Okay. So I do know that
23 normally EPA will say ten percent safety factor. So
24 do you know anywhere where they've been flexible on
25 the safety factor? Some examples?

1 MR. GEBRMICHAEL: Well, I'm comparing
2 to other jurisdictions, you know, they -- they apply
3 five percent and ten percent, but you're right, ten
4 percent has been the usual one. But if you have a
5 huge frictional loss, it should be left to the
6 discretion of the OCD -- yes. Yes. And then, for
7 instance, in this case, they are using a 5.5 inch
8 tubing in tandem with that permeability for a --
9 0.03 --

10 MR. AMPOMAH: Yeah.

11 MR. GEBRMICHAEL: Yeah. There's
12 something in there. So in that case, we expect that,
13 you know, applying that ten percent is -- is a safe
14 way to go.

15 MR. AMPOMAH: Okay.

16 MR. GEBRMICHAEL: Yeah.

17 MR. AMPOMAH: Okay. So let's clarify a
18 little bit. You know, so yesterday there was a
19 distinction between DFIT and -- fracs, and I
20 remember -- from Chevron was saying that, you know,
21 the higher -- in DFIT compared to mini frac. So in
22 your Exhibit number 4 --

23 MR. GEBRMICHAEL: The second point --
24 sorry, it's -- is there a difference between mini frac
25 and DFIT?

1 MR. AMPOMAH: Oh, yeah. Yeah. Yeah.
2 MR. FUGE: -- probably --
3 DR. AMPOMAH: Yeah.
4 MR. FUGE: -- allowed --
5 THE WITNESS: Yes.
6 DR. AMPOMAH: Yeah.
7 MR. FUGE: -- the witness has sworn.
8 You were sworn in yesterday, so obligations -- yes,
9 please come up.
10 WHEREUPON,
11 TOM MERRIFIELD,
12 called as a witness and having been previously sworn
13 to tell the truth, the whole truth, and nothing but
14 the truth, was examined and testified as follows:
15 MR. MERRIFIELD: Normally -- mini frac
16 -- virtual connectivity interruption --
17 THE REPORTER: -- witness come to the
18 mic, please.
19 MR. FUGE: Can you come to the mic,
20 please?
21 MR. MERRIFIELD: Can you hear me now?
22 THE REPORTER: Yes.
23 MR. FUGE: -- down --
24 THE REPORTER: Thank you.
25 MR. MERRIFIELD: Normally a mini frac

1 is run open hole with an NDT tool or an RDT tool and
2 so a -- a -- gauge against the -- the actual
3 reservoir.

4 MR. GEBREMICHAEL: Okay.

5 MR. MERRIFIELD: And -- and so one of
6 the challenges under that situation is -- is -- it is
7 more economical. It's faster. But the reliability
8 or -- or the chance of getting good data and no
9 leakage -- up against the reservoir is less. Now, it
10 tells you at the same time of day who -- gives its
11 injection test.

12 Usually it manages its -- its over a
13 little bit longer interval than -- that with a DFIT
14 'cause a DFIT is really through one preparation for
15 the casing. But the reason why we wanted to go with
16 DFITs, still it's an injection test. It wasn't that
17 if we run it, we have a 95 percent chance of getting
18 good data.

19 With the mini frac, our experience with
20 our SWDs it's down around 40 percent. And if we're
21 going to spend the time and effort, we -- we don't
22 want -- we want to make sure we get good data.

23 MR. GEBREMICHAEL: No. That's great.

24 MR. MERRIFIELD: And -- and that's --
25 that's the reason why we're --

1 MR. GEBREMICHAEL: Yeah. The only
2 question I have on this one is given the -- your
3 intervals are long; right? The top and then the
4 bottom perforation is around 4,000 feet; is that
5 right? And there's two wells?

6 MR. MERRIFIELD: It's -- it's a
7 little -- and this is Severitas.

8 MR. GEBREMICHAEL: And Severitas is
9 around 3,000 something? And then -- and Papa Squirrel
10 is around 4,000. So the only concern that I have is
11 such a long interval when you -- are you confident
12 right now with the DFIT?

13 MR. MERRIFIELD: We're -- we're going
14 to take some purpose -- what -- what I think the OCD
15 and -- and the Commission are kind of struggling with
16 right now is -- is, you know, how are we actually
17 going to use the DFITs?

18 MR. GEBREMICHAEL: Well, I'm not sure.

19 DR. AMPOMAH: You know, because I have
20 a concern about using the mini frac -- so I just want
21 to clarify whether mini frac -- so -- meaning, DFIT or
22 let's say either you can use either of them?

23 MR. MERRIFIELD: You can use either one
24 and -- and all we're saying is we want to know -- the
25 DFIT. We -- prefer to go with the DFIT --

1 MR. AMPOMAH: Yeah. And --

2 MR. MERRIFIELD: Because of the
3 reliability -- the chance of success of gaining good
4 data is higher.

5 MR. AMPOMAH: I brought that out
6 because, let's say the way it is read it's more like
7 you -- for mini frac. Now, what about -- Commission
8 doesn't allow you to perform mini fracs? You know, so
9 then you have no choice but to go for DFIT. All
10 right. So --

11 A Right. And -- and we basically, you know,
12 have opted to -- to not even attempt an -- mini frac.

13 Q Okay.

14 A We're -- we're wanting specifically -- when
15 we say DFIT, we mean DFIT.

16 MR. GEBREMICHAEL: Yeah. So I do have
17 a concern with this -- presented to us now. So
18 even -- OCD my want to look at it --

19 MR. FUGE: Mr. Tremaine?

20 MR. TREMAINE: I just want to make a
21 point. I just want to make sure that during we're one
22 the record Mr. Chair, and so if you wanted -- or if
23 you wanted the Commissioners want to ask witnesses
24 questions, I have no objection to that whatsoever.

25 I do ask to limit discussion between

1 witnesses just for clarity of the record. And Mr.
2 Gebremichael can answer questions directly back to the
3 Commission.

4 I just want to make sure that we had
5 it. We're very clear and -- people. The
6 Commissioners' questions would be appropriate, and I
7 think OCD is very willing to consider revision
8 of -- general -- this is information for the
9 Commission.

10 This is a order for a general
11 application, and I think the feedback on DFIT versus
12 mini frac's something that OCD's definitely interested
13 in and I know Mr. Gebremichael will respond to that.

14 DR. AMPOMAH: Okay. So I have a
15 question. I thought that the step rate test is going
16 to be done. That's all, let's say -- you think -- or
17 let's say is going to be done entirely? So I don't
18 know how the Chevron application is because --

19 MR. GEBREMICHAEL: Well, we -- we --
20 the -- they haven't specified that yet.

21 DR. AMPOMAH: Well then let's talk
22 about that.

23 MR. GEBREMICHAEL: Yes. That's why
24 I -- I mentioned it in the past, some operators, they
25 did -- step rate test for both; right? Well, we have

1 seen that step rate graph, the pressure versus rate is
2 you -- you get an early deflection and then a second
3 deflection. So -- probably, still we are in the data
4 gathering mode; right?

5 And then this is our
6 recommendation. If you tested them separately, you
7 get two deflection points separate graphs. And then
8 the lowest one is going to dictate or govern what the
9 maximum surface injection pressure is going to be.

10 DR. AMPOMAH: So just to be clear,
11 then, OCD is going to insist -- I want to say more
12 like discuss whether greater that you referred them to
13 doing a separate test?

14 MR. GEBRMICHAEL: Separate.

15 MR. AMPOMAH: Separate.

16 MR. GEBRMICHAEL: Yes.

17 MR. FUGE: Commissioner Ampomah, I
18 think I would clarify here. That may be something for
19 us to provide guidance on in response to the
20 application. I'm just -- we can discuss in
21 deliberations, but I think there are some questions
22 here about how we --

23 DR. AMPOMAH: Yeah, I have one. It's
24 more like -- because the way you present that, I
25 thought that was -- the application, but --

1 MR. GEBRMICHAEL: No. No.

2 MR. AMPOMAH: So --

3 MR. GEBRMICHAEL: No. Like -- like I
4 said, you know, each well is -- due to the
5 heterogeneity of the reservoir; right? You have to
6 take it case by case. In this case, what I have seen
7 is the -- both the Bell and Cherry, they are the
8 injection zones; right? And then they are -- so by
9 doing that, we -- it will help us testing them
10 separately to determine the right maximum allowable
11 surface injection pressure.

12 MR. AMPOMAH: I have a last question.
13 So you made reference to Chevron's RTA analysis that
14 they did when it was showing that the, we can see the
15 movement of the -- of the injected water.

16 MR. GEBRMICHAEL: The model?

17 MR. AMPOMAH: Yeah, the model. Do you
18 feel that Virginia's model is adequate, you know,
19 fully understand the movement of the water?

20 MR. GEBRMICHAEL: It's -- no, I'm not
21 in the position to say. You know, I'm -- I'm not an
22 expert in hydrology modeling, but it's a fact. You
23 can calibrate, you know, with the other data that you
24 have; the SRT, Hall's plot and then this model and
25 then it tells us the, you know, the path of the

1 injected, you know, so that's how I --

2 MR. AMPOMAH: So it could still be
3 adequate -- data --

4 MR. GEBRMICHAEL: Yes.

5 MR. AMPOMAH: -- and the other data --

6 MR. GEBRMICHAEL: Yes. Yes.

7 MR. AMPOMAH: Okay. Thank you.

8 MR. FUGE: Mr. Bloom?

9 MR. BLOOM: No questions. Thank you
10 for your testimony.

11 MR. FUGE: No questions for me either.
12 Any redirect? The witness is excused.

13 Mr. Tremaine, do you have any more
14 witnesses?

15 MR. TREMAINE: No further witnesses.

16 THE WITNESS: Thank you.

17 MR. FUGE: I think we'll allow for some
18 brief closing remarks from the parties, starting with
19 Chevron, OCD, and then counsel for Mewbourne if you
20 have any closing comments?

21 MS. BENNETT: Thank you. I just have a
22 few closing comments and then a potential item --
23 coordinate with Mr. Tremaine. Chevron and I both
24 appreciate the Commission's time and the
25 thoughtfulness that went into this hearing. I

1 personally feel like we have discussed a number of
2 very important issues with the Commissioners and with
3 the OCD witnesses and also with the Mewbourne
4 questions.

5 So really appreciate the Commission's
6 time and also the willingness to sort of put us on a
7 trailing docket that worked out well for everyone I
8 think. So definitely appreciate your coordination and
9 collaboration on these hearings and the thoughtful
10 questions that were asked.

11 My takeaway from the different sessions
12 that we've had is that everyone is on -- everyone
13 acknowledges the need for -- disposal options in New
14 Mexico, and those -- I don't want to do that, but a
15 slogan from a couple of administrations ago about all
16 of the above. And that's what I feel like we're
17 talking about here today, is that this DMG disposal is
18 an important component of the all of the above
19 disposal options that are available to the Division
20 and available to New Mexico and available to
21 operators.

22 And the evidence that Chevron put on
23 today, as well as the evidence from the OCD, reflects
24 that DMG disposal can be done in a way that protects
25 correlative rights and prevents waste and that's also

1 protective of underground sources of drinking water.
2 And so the evidence today and yesterday I believe
3 in -- it shows the viability of these type of
4 projects.

5 And when you combine that with
6 Chevron's diligence and its desire to do data
7 collection and its desire to be transparent with that
8 data collection, it seems like a win-win for the
9 Division, for the Commission, for New Mexico in
10 addition to Chevron of course.

11 But it allows the ability of Chevron to
12 manage the producers and the disposal wells here I
13 think is key for the pilot project, as is the notion
14 of selecting two different wells for the pilot project
15 with different geology and different interim,
16 different porosity, and different characteristics that
17 Chevron is committed to reviewing, monitoring, and
18 then providing the data to the Division and to other
19 stake holders.

20 So again, we really appreciate the
21 Commission's time. I understand Commissioner Bloom's
22 question about next steps, and I would like to
23 coordinate with Mr. Tremaine and Ms. Hardy on next
24 steps that might be helpful for the Commission,
25 including as Mr. Goetze suggested, submitting an order

1 or a proposed form of order that the parties work on
2 together for the Commission's review.

3 But of course that's something that I
4 would leave to the Commission to decide whether that
5 would be helpful and then also to coordinate with
6 other members of other counsel and other parties here
7 about the process to move that forward.

8 I do know that the Commission has a
9 very busy schedule coming up between the legislative
10 session and then the PFAS rulemaking. And we --
11 Chevron appreciates the time that we were able to
12 spend today. And so it's hopeful that there isn't a
13 huge lapse of time between now and the time that we
14 can get some -- perhaps some further guidance from the
15 Commission.

16 And so we're just recommending that --
17 I am here committing my full efforts to whatever I can
18 do on Chevron's behalf to move this forward. Thank
19 you very much.

20 MR. FUGE: Thank you.

21 Mr. Tremaine?

22 MR. TREMAINE: Mr. Chair,
23 Commissioners, thank you for this opportunity. You
24 know, I think the hearing kind of made it clear and
25 OCD has expressed really, kind of, three overriding

1 concerns here. There's a recognition that there's a
2 truly significant need for additional disposal; OCD
3 recognizes that.

4 The water disposal is -- plots.
5 There's also quite a bit of uncertainty related to
6 certain aspects of the geological information that's
7 necessary for OCD approval. And that drives OCD's
8 request or, you know, determination that additional
9 information is necessary in terms of the applications,
10 whether they're before this Commission or whether
11 they're approved administratively.

12 And that DMG disposal, despite the
13 assurances and everything that we've heard here in
14 this hearing, does represent a potentially significant
15 potential for interference if something goes wrong.
16 So those safeguards are truly necessary. I think that
17 I'd like to address a couple items on Exhibit 11. We
18 talked about that for a bit.

19 And I want to clarify for the
20 Commission that, you know, Exhibit 11 as an internal
21 administrative review document that -- these
22 conditions, they're not set in stone, first of all.
23 But as a snapshot in time, this is what the Division
24 feels is necessary and appropriate given OCD's
25 existing authority and the fact pattern surrounding

1 information available regarding the Delaware Mountain
2 Group generally.

3 So I -- there's been a lot of
4 discussion about what needs to be approved by the
5 Commission and what is being performed by the
6 Division. I think that's appropriate and entirely
7 respectful, but I think it's necessary to push a
8 little farther and say that the recommendations that
9 are put forth in OCD Exhibits 11 and 12, I think I
10 want to make clear for the record that those are
11 appropriate under existing authorities; right?

12 This isn't -- these cases before the
13 Commission require this particular type of approval,
14 so this is not a new set of requirements that OCD's
15 presenting to the Commission.

16 These are -- as I said earlier, you
17 know, appropriate and consistent with OCD's
18 generalized authority and testing authorities under
19 both statute and rule. So these are general plans
20 that are provided for information. In terms of what
21 the Division does with those in this case, I think it
22 is not strictly necessary that the Commission adopt
23 those as a general guideline.

24 I think that -- ask specifically is
25 that the Commission adopt those as a floor specific to

1 cases 23686 and 7. And so while they're provided as
2 general information, they're adopted specific to the
3 facts of these cases, along with the other specific
4 modifications that we've discussed above and beyond
5 what's contained in those exhibits.

6 So I just wanted to clarify that what
7 we're doing here, what the ask is ultimately. And I
8 do share -- I think there's been a lot of good
9 discussion back and forth prior to this hearing and
10 during this hearing about what's appropriate and it
11 seems that the updates are close. There's some
12 details to hammer out. Some clarifications about SRTs
13 and reasons, et cetera.

14 And I think that, you know, despite
15 what I said, obviously this Commission has authority
16 to modify those based on the information provided.
17 But it seems like it would be the best most efficient
18 course of action if parties work together on a
19 proposed order and if there was something that needed
20 to be modified in that then the Commission could
21 certainly do so.

22 MR. FUGE: Ms. Hardy?

23 Thank you, Mr. Tremaine.

24 MS. HARDY: Thank you. And I'll be
25 brief. I'd like to thank the Commission for its time

1 and hearing all of the testimony, and giving
2 thoughtful consideration to these issues that have
3 potentially serious implications.

4 Mewbourne, again, does not oppose
5 Chevron's applications as long as appropriate
6 conditions are opposed on the injection and
7 appropriate monitoring occurs to ensure protection of
8 correlative rights. And in that regard, we support
9 OCD's proposed conditions on this -- on these permits.
10 So thank you very much.

11 MR. FUGE: Thank you.

12 Thank you, everyone. That was a very
13 informative presentation. Unless my fellow
14 Commissioners feel it's necessary, I think we can just
15 deliberate in public?

16 UNIDENTIFIED SPEAKER: Yes. Yes.

17 MR. FUGE: And I might kick off with
18 some observations and then turn it over to my
19 Commissioners. I 100 percent agree with the
20 statements that, you know, managing produced water is
21 an ongoing challenge and something we need to look at
22 and optionality's important, at least from where I
23 sit.

24 I'm not sure DMG disposal is the
25 panacea that fixes it all. I still think you're going

1 to -- truly going to need all of the above, which
2 includes some deep disposal. And certainly the
3 remarks of, sort of, written concluding remarks that,
4 sort of, Chevron put in the -- record, just reacting
5 to it, yeah, deep as well as it was contributing to
6 seismicity but also an ongoing discussion that doesn't
7 attribute to seismicity everywhere.

8 And so there are some other questions.
9 I really do think it's a component. We do have a -- I
10 think we need to be careful. We do have correlative
11 rights. So looking across the border into Texas is
12 not a great model for us because we do have an
13 obligation to protect correlative rights and prevent
14 waste. So I think it's appropriate that we, sort of,
15 take these steps carefully.

16 But I think that's why it's important
17 to begin looking at a pilot project at the edge of the
18 exclusion zone. I would say, at least in my
19 observation, yeah, the evidence offered in the record
20 maybe doesn't go so far as to say that disposal can be
21 done in the Avalon exclusion zone writ large, but I
22 think Chevron has demonstrated today that their
23 proposed disposal at the two wells, at least from
24 where I'm sitting, can be done within the portion of
25 the Avalon exclusion zone that Chevron's operating in.

1 And I say, sort of, approaching this
2 with caution may be more of a message to others who
3 might be looking to pursue this. You know, we're
4 going to do this deliberately. Or, I think we should
5 be doing this deliberately.

6 I think we should be providing guidance
7 to OCD that enable to do factions of it
8 administratively on salt water -- most salt water
9 disposal wells don't actually come to the Commission
10 because a lot of them are handled administratively or
11 at Division hearings. But I think it's incumbent upon
12 the Commission to provide some guidance about how
13 that's done and, sort of, you know, what the pieces
14 are like.

15 And I guess I'd lastly say my fellow
16 Commissioner, Dr. Ampomah, asked some questions about
17 water and the water delta and water graph. And
18 unfortunately, we -- to ourselves. The state in its
19 wisdom decided they're getting better data on produced
20 water, where it goes, goings, and other pieces. We
21 know.

22 I'll state for the record to the extent
23 the Texas Rail Commission watches this, they take
24 loads of water for Louisiana or almost all of it.
25 They take loads of water from Oklahoma, and they're

1 currently, except until real recently, has been a lot
2 of good data on it.

3 So New Mexico, we've got a good handle
4 on the problem and, sort of, what are the pieces. I
5 think that's why it's incumbent upon us to begin
6 thinking about ways to address it.

7 And I guess my last thoughts here. I
8 think in the back-and-forth Dr. Ampomah also asked,
9 you know, what are we deciding on; what are the
10 pieces? I think there are two things: I think
11 offering some observations, and I'm not sure it's a
12 blessing or an approval on OCD's Exhibit 11, which is,
13 sort of, the standard rules of the road -- thinking
14 about administratively is important, at least
15 providing some -- we're comfortable with this list.

16 I'm not sure we're there based on the
17 questions and, sort of, feedback. And then I think
18 there are the specific applications before us. And I
19 guess I'd close with this: At some level, this
20 strikes as an application that can be permitted using
21 OCD standard templates and we're talking about special
22 conditions that are attached to it.

23 Aspects of Exhibit 11 don't exactly
24 trace over onto that permit because, well, for
25 example, we are in the Avalon exclusion zone. But I

1 think where we are -- at least where I am -- is, if
2 this case gets continued, and I'm willing to continue
3 it shortly for the parties to come together and put
4 together an order using OCD's established templates
5 that has appropriate special conditions in it and
6 write up the testimony that we receive, at least on my
7 end, I would flag -- and this is maybe something
8 specific -- I'm going to pull up the exhibit numbers.
9 Bear with me one second. I had them and then I
10 flipped to another.

11 Does Chevron happen to know the
12 exhibits where they showed the maximum rate and the
13 volumes and it was, like, different colors and years
14 out? Do you know the page number? Oh, yeah. I found
15 it. One, in putting those together, at least from
16 where the Chair sits, I think at the sort of,
17 injection rate, the maximum injection rate, I believe
18 that's the condition in our standard permit template.

19 I see for Papa Squirrel the modeling
20 does show it's theoretically maybe gets up to 20,000,
21 so that's something there. The Severitas is, sort of,
22 notably below the 15,000, so I'm thinking about how
23 your developing a permit for that well, maybe, sort
24 of, align it a little better with your modeling.

25 I'm sensitive to the testimony of Mr.

1 Goetze that we'd -- authorized his daily limits that
2 would never, ever, ever be reached but, sort of,
3 theoretically as you're, you know, managing
4 reservoirs. It's a question.

5 But put it on the parties to come back
6 with, sort of, an order package that follows our --
7 that follows the OCD's standard permit template is an
8 order issued by the Commission with special conditions
9 that I think track the testimony and feedback here. I
10 think that's one element.

11 I would also encourage at the same
12 time, because I heard from the OCD that you are
13 looking for at least some Commission guidance in other
14 pieces, that Exhibit 11, those elements that are
15 appropriate for the specific cases Chevron's had been
16 incorporated in, but that there'd also be an updated
17 Exhibit 11 that reflects some of the feedback and
18 questions you've heard.

19 Again, not clear that it's a sort of
20 generalized guidance document, but that is something
21 that, at least from where I'm sitting, the Commission
22 needs to approve. But it is something we could
23 provide some guidance on. And I think as submitted,
24 there were certainly some feedback from my fellow
25 Commissioners that I think should be incorporate

1 before we opine on it. So those are my observations.

2 Commission Bloom?

3 MR. BLOOM: Sure. Thank you, Mr.
4 Chair. Yes, I would agree that as we're here, we're
5 here to protect correlative rights, prevent waste,
6 and, you know, also protecting and helping the
7 environment. All that includes proper water
8 management.

9 And I see the parties working together
10 to prepare for the OCC a draft order that includes
11 what we heard the past two days from Chevron and the
12 OCD and using OCD's Exhibits 11 and 12 to inform a
13 draft order in these two cases. Thank you all for
14 your time and presentation. Appreciate it.

15 DR. AMPOMAH: Okay.

16 MR. FUGE: Mr. Ampomah?

17 DR. AMPOMAH: Yeah, Chair, sounds like
18 you summarized the small detail, you know, in terms of
19 what we've had -- two days and then also the next
20 steps. And I do appreciate the -- Chevron -- this was
21 really comprehensive presentation, you know, I do
22 appreciate that compared this to what some of the
23 presentation I've seen -- this is really
24 comprehensive.

25 So I do appreciate that. And I do also

1 support that the parties should come together, work on
2 the order with the conditions for the Commission's
3 approval or Commission review. And I'm sure we've
4 made mention of quite a number of issues. And we
5 looked the -- take that into consideration in drafting
6 the order. Thank you.

7 MR. FUGE: So I suppose, hearing that
8 discussion, I would propose we move to continue this
9 case to the next scheduled meeting, for the parties to
10 make an attempt to provide an order and the
11 independently an updated Exhibit 11.

12 Obviously, like all things moving on
13 the docket, things can adjust based on how those
14 discussions are going, but I think being sensitive to
15 the need to start developing some of these disposal
16 options of continuance to the next meeting is an
17 appropriate step.

18 So if I can get a second on a motion to
19 continue this case to the next meeting for preparation
20 or presentation to the Commission of the draft order
21 and an updated Exhibit 11?

22 MS. HARDY: Yes.

23 MR. BLOOM: I second.

24 MR. FUGE: Dr. Ampomah, how do you
25 vote?

1 DR. AMPOMAH: Approved.

2 MR. FUGE: Commission Bloom?

3 MR. BLOOM: Approved.

4 MR. FUGE: Let the record reflect that
5 a motion was adopted unanimously. And the only
6 other -- there were no other active items on the
7 agenda. Obviously, we had pending litigation just
8 noted it was there, but there was no substantive
9 update.

10 It's just noting that the case remains
11 pending. Are there any other items for the Oil
12 Conservation Commission?

13 UNIDENTIFIED SPEAKER: Thank you, Mr.
14 Chair. I think there was an update on the -- case if
15 you --

16 MR. FUGE: Oh. Sorry. Real quick.

17 UNIDENTIFIED SPEAKER: -- case other
18 than to say that the response that the motion --
19 pleadings -- is 21st of this month. So --

20 MR. FUGE: Oh.

21 UNIDENTIFIED SPEAKER: So I don't know
22 if we'll --

23 MR. FUGE: Do we anticipate additional
24 briefing or is that too early to tell?

25 UNIDENTIFIED SPEAKER: Well, there'll

1 certainly be a reply.

2 MR. FUGE: Okay.

3 UNIDENTIFIED SPEAKER: And then so far
4 we have -- we joined in the motion on the pleadings.

5 MR. FUGE: Okay.

6 UNIDENTIFIED SPEAKER: As to whether we
7 will have to go line by line and admit or deny the
8 allegations in that 500 paragraph complaint remains to
9 be seen.

10 MR. FUGE: Okay.

11 UNIDENTIFIED SPEAKER: I will have a
12 decision from the Court based on the briefing schedule
13 probably early next year.

14 MR. FUGE: Sounds good.

15 UNIDENTIFIED SPEAKER: That's all.

16 MR. FUGE: Thank you.

17 Any other items of business? If not, I
18 call this meeting adjourned. Thank you very much.
19 Glad everyone was able to join us in Pecos Hall. Even
20 though we're not quite there from the check, it was
21 great to see you all. Have a good day.

22 MS. BENNETT: Thank you.

23 (Whereupon, the meeting concluded at
24 12:46 p.m.)

25

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CERTIFICATE OF DEPOSITION OFFICER

I, JAMES COGSWELL, the officer before whom the foregoing proceedings were taken, do hereby certify that any witness(es) in the foregoing proceedings, prior to testifying, were duly sworn; that the proceedings were recorded by me and thereafter reduced to typewriting by a qualified transcriptionist; that said digital audio recording of said proceedings are a true and accurate record to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.



JAMES COGSWELL
Notary Public in and for the
State of New Mexico

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25

CERTIFICATE OF TRANSCRIBER

I, CHRIS E. FLOYD, do hereby certify that this transcript was prepared from the digital audio recording of the foregoing proceeding, that said transcript is a true and accurate record of the proceedings to the best of my knowledge, skills, and ability; that I am neither counsel for, related to, nor employed by any of the parties to the action in which this was taken; and, further, that I am not a relative or employee of any counsel or attorney employed by the parties hereto, nor financially or otherwise interested in the outcome of this action.



CHRIS E. FLOYD

[& - 3c]

&	121:20 122:19	18 47:18	2018 52:12
& 4:14	128:15 131:16	19 83:20,20	76:8 80:4
0	148:17,20	1a 62:23 96:2	2018/2019 81:8
0.03 136:9	149:9 154:12	1b 63:10	2020 12:2
0.2 49:20 51:12	154:23 156:14	1c 64:5	83:20
52:4 53:19	156:17 157:12	1d's 64:18	2023 1:9 6:4
54:5 75:3 90:2	158:11,21	1st 1:14	21 99:5
90:7,11 105:7	11-23 1:5	2	21st 159:19
105:13,19	119 3:13	2 4:16 14:7,8,9	22 87:17
126:1 127:2	11:10 86:5	22:8 30:11,14	23686 4:3 6:15
0.2. 50:10	12 5:9 98:12	31:4,11 39:19	6:17 150:1
0.25. 53:6	121:20 122:20	55:19 101:15	23687 4:5 6:15
0.5 53:2	123:6,8 124:24	20 3:5 84:1,11	6:17
02 1:3	128:13,16	84:19	250 14:14
1	131:16,24	20,000 76:10	267 8:24
1 4:14 12:7,8	132:3 149:9	82:22 105:15	27 3:8
12:17,21	157:12	155:20	28490 162:17
1.5 65:16	12/12 4:15	2000 114:8	2b 96:15
10 5:7 55:7,8	121 98:19	2000s 22:9	2c 69:20 111:22
126:12	121/121 4:17	25:13	3
10,000 76:10	1220 1:15	2006 11:25	3 4:17 121:5,6
82:21	123/132 5:9	2007 14:13	121:12
100 151:19	12:46 160:24	17:11	3,000 139:9
108 4:4,6 62:11	13 4:19 22:25	2010 14:14	30 82:14 84:18
67:21 68:4	98:12	15:11	30,000 76:10,11
112:2 114:3,6	131 3:14 51:10	2010s 15:10	83:2
11 5:8 29:12	132 3:15	2011 12:2	30/31 4:16
60:21,22 61:19	147 5:10 9:6	2014 35:19	300 29:15
62:14 77:23	15,000 105:16	2014/2015	31/86 4:22
78:16 80:11	155:22	47:21	32311 161:19
83:5 86:18,24	150 5:12 8:24	2016 52:12	35/86 4:23
93:2,4 96:1	9:6	2016/2015	3a 70:12
97:19 106:15	158 128:18	35:15	3b 71:24
111:22 113:6	17 11:25	2017 52:12	3c 72:9,11

[4 - active]

4	60/86 5:8	ability 32:11	account 40:22
4 4:18 13:2,3 13:19,20 14:5 22:9 33:18 121:20 136:22	65 33:18	65:21 66:19	accuracy 74:3
4,000 139:4,10	69 32:24	71:6 83:1	90:24
40 84:18	7	99:22 126:14	accurate 53:24
138:20	7 4:9,24 43:8	146:11 161:10	56:21 60:4,24
43/86 4:25	43:11,12 44:10	162:7	61:5 68:23
45 80:4	47:15 150:1	able 11:2 48:8	71:19 82:13
49/86 5:4	700 111:7	57:20 66:20	87:11 91:16
4a 73:20	70s 70:21	71:2 102:23	161:9 162:5
4b 74:5	77 30:8	104:8 107:11	achieve 82:22
4c 74:21	8	116:13 131:10	achinivu 2:15
4d 75:17	8 4:10 5:4	133:1 147:11	acid 39:19
4e 76:6	32:23 49:2,3,5	160:19	42:12 62:5
4f 77:1	49:6 51:7	above 49:25	66:7 67:1
5	98:11	50:10 51:3	72:12,20,25
5 4:20 31:17,18	80s 14:24 70:20	53:22 72:7	73:12 101:17
86:18,24	83 94:19,20	145:16,18	102:7 103:12
126:11	84 3:9	150:4 152:1	acknowledge
5.5 72:1 136:7	87505 1:16	absolute 106:1	10:19
50 84:18 111:6	9	absolutely	acknowledges
50,000 82:8	9 1:9 3:4 4:4,6	89:13 133:23	145:13
500 160:8	4:7,8 5:5,11,13	acceptable	acquired 23:16
50s 14:24	52:19,20,23,24	80:13 113:19	acquiring
52/86 5:6	90s 15:2	acceptance	78:17
55/86 5:7	94 3:10	121:2	act 29:5,6
553 80:5	95 138:17	accepted 7:10	64:25 79:5
5531768 1:22	97 44:17	7:11 30:25	85:3
6	99 111:6	72:22 86:23	action 27:9
6 4:23 35:9,11	9:01 1:10	119:16 132:2	129:22 150:18
35:12	a	access 69:25	161:12,16
	a.m. 1:10	accommodate	162:8,12
	abandoned	79:24	actions 112:23
	43:22 44:21	accommodati...	active 77:17,22
		131:6	159:6

[actual - alternatives]

<p>actual 17:16 21:1 99:14 102:13 138:2 actually 16:20 36:20 50:19 51:15 54:13 73:5 77:7 86:9 88:2 98:20 117:5,7 139:16 153:9 add 59:6 79:18 104:10 107:13 107:14,15 131:22 added 26:12 36:6 84:1 97:15,22 addition 73:20 146:10 additional 20:6 23:23 24:12 38:25 58:10 61:19,21,22 64:15 73:17 75:15 79:13 87:11,18,19 89:8,19 92:5 94:14 97:15 98:8 99:20 113:5 116:23 125:2 148:2,8 159:23 address 81:19 98:18 148:17 154:6</p>	<p>addressed 17:2 adequate 63:2 143:18 144:3 adequately 94:23 103:1 adjourned 160:18 adjust 158:13 administrations 145:15 administrative 6:24 11:18 60:11 61:1 68:2 78:3,7,12 86:14 90:16 93:3 103:5 105:20 122:14 148:21 administrativ... 20:14 58:20 63:3,12 68:11 69:17 77:19 90:11 92:24 96:6,12 103:13 103:15,21 105:2,19 115:13 125:25 127:1 148:11 153:8,10 154:14 admirable 93:24 admission 8:5,7 12:17 31:4,5 86:17,20</p>	<p>131:23 admit 7:4 160:7 admitted 7:13 8:11 9:1,5,11 9:15,17 12:20 90:10 121:11 adopt 106:25 149:22,25 adopted 84:23 150:2 159:5 advanced 120:23 advantageous 50:9 advertise 67:23 advertisement 67:23 advise 80:21 affect 67:5 affirmative 6:22 afternoon 120:15 agencies 21:6 21:17 agenda 1:5 159:7 agi 67:4 107:21 ago 114:18 145:15 agree 93:17 151:19 157:4 agreement 45:16 49:19 65:18 95:11</p>	<p>97:8 112:7 agreements 29:22 agrees 24:11 ahead 39:14 45:2 73:5 78:11 86:10 101:2 alarming 117:8 align 155:24 aligned 87:10 101:4 allegations 160:8 alleviate 66:14 allotment 124:12 allow 42:17 51:2 119:21 124:11 140:8 144:17 allowable 121:25 125:16 126:8,17,24 143:10 allowed 137:4 allows 47:1 60:2 101:12 133:6 146:11 alternative 40:3 41:13 52:15 81:9 85:9 alternatives 81:17</p>
--	---	--	---

[amend - approval]

<p>amend 101:7 amended 7:19 amount 49:16 72:18 81:6 82:6 90:21 95:2 102:8 amounts 79:23 ampomah 2:4 6:7,8 8:25 25:9 25:11,23 26:10 26:15 69:5 81:21 100:15 100:16 101:24 103:24 104:3 105:6 106:6,12 107:2,12,16,20 108:13 110:4 111:13,17,18 113:21 117:1,4 117:14 119:6 121:8 135:17 135:18,22 136:10,15,17 137:1,3,6 139:19 140:1,5 141:14,21 142:10,15,17 142:23 143:2 143:12,17 144:2,5,7 153:16 154:8 157:15,16,17 158:24 159:1 analysis 105:9 143:13</p>	<p>andres 83:11 94:20 answer 121:21 141:2 anticipate 159:23 anyways 64:16 aor 42:16 111:25 112:4 112:24 113:8 aors 59:23 apart 51:18 61:6 84:4 127:3 api 103:9 apologies 11:7 apologize 8:19 apparent 32:8 apparently 83:20 appear 98:18 appeared 119:16 appears 37:23 applicability 124:16 applicable 48:13 124:25 applicant 62:10 79:21,21 112:5 applicants 38:24 57:12 98:7 107:7 113:24 129:11</p>	<p>application 4:3 4:5 6:17 18:19 19:19 25:25 37:24 51:17 57:7,22 58:7 63:25 68:4 69:1 71:18 73:13 80:13 81:6 89:12 90:16 91:10,10 91:17 107:17 109:22 110:5 111:24 112:21 114:3 122:14 123:18 124:2 124:10 126:9 128:11 141:11 141:18 142:20 142:25 154:20 applications 16:10 19:8 23:22 32:21,21 34:23 38:19,23 38:25 39:2,3,7 39:9,18 42:9 43:6 48:14 58:5 61:5,6 69:21 80:3,4,5 82:8 83:17 89:20 91:12 93:3 96:3 98:9 107:18,22 113:3 122:7,10 148:9 151:5 154:18</p>	<p>applied 22:23 127:17 130:11 134:1 applies 69:21 103:15 107:21 apply 63:13 124:5 136:2 applying 125:16 136:13 appreciate 22:6 85:24 87:8 116:15 144:24 145:5,8 146:20 157:14,20,22 157:25 appreciates 147:11 approach 23:20 24:3 70:23 102:14 approaching 153:1 appropriate 19:6 20:14 57:13 61:21 75:13 129:21 141:6 148:24 149:6,11,17 150:10 151:5,7 152:14 155:5 156:15 158:17 approval 19:6 20:12 24:19,22 26:12 36:8 43:24 48:25</p>
---	--	---	--

[approval - available]

<p>50:15 60:11 61:2 78:7 84:21 100:4 103:9,21,25,25 104:11 123:1 148:7 149:13 154:12 158:3 approvals 78:3 121:22 approve 19:7 50:3 58:20 63:3,12 107:17 115:3 127:2 156:22 approved 43:19,23 46:9 50:19 53:2,15 62:3 78:8 83:17,17,18 90:11 98:6 103:15 105:20 148:11 149:4 159:1,3 approves 5:5 approving 107:22 arbitrarily 51:20 area 15:17,20 16:3,11 17:10 18:4,5,10,20,24 19:4,12,14,16 19:25,25 22:17 23:4,8,10,14 25:17 26:6</p>	<p>36:2 38:8,19 39:3 40:21 41:4,20 42:3,6 42:8,12 43:5 43:25 49:16 51:15,19 53:14 57:15,23,25 58:16 60:5 61:13 63:4 64:8,15 65:15 65:24 66:1 67:9 69:20 76:14 82:18 87:11 88:18 99:15,16 100:5 100:9,11 112:9 113:14 area's 68:20 areas 13:23 14:17 17:1,1 17:14,15,17 18:2 25:21 30:7,25 31:5 32:20 35:16 36:12,14,16,17 38:13,20,24 50:11 51:6 53:5 57:17 58:8 65:14 81:14 88:22 89:2 113:12,16 113:19 118:22 121:3 argument 65:19</p>	<p>asked 8:16 36:1 62:2 90:13 98:8 109:1 113:22 114:10 115:24,25 128:18 145:10 153:16 154:8 asking 10:22 58:14 102:4 104:6 105:5 110:15 115:1 aspect 82:7 aspects 34:15 148:6 154:23 assess 40:14 77:9 78:18 assessed 52:8 assessment 36:5 62:5 70:3 71:19 111:25 assessments 29:17 assign 126:8,24 assigned 41:1 assigning 126:6 assist 76:19 78:17 97:11 assistance 110:3 assisted 97:9 associated 34:18 39:17 assuming 78:3 assurances 148:13</p>	<p>attached 154:22 attack 93:22 attempt 81:2 140:12 158:10 attempting 66:24 attempts 70:24 attendees 2:2 attention 13:2 50:9 55:18 69:5 128:12 attorney 2:6,7 2:8,9,10 161:14 162:10 attorneys 42:14 attribute 152:7 attributed 44:3 51:2 52:2 99:2 audio 161:8 162:3 authorities 149:11,18 authority 37:24 46:20,21 53:2 79:5 83:18 84:8 93:13 148:25 149:18 150:15 authorized 156:1 automatically 129:15 available 32:16 39:23 54:20</p>
---	---	---	---

[available - better]

<p>66:17 69:24 75:7 145:19,20 145:20 149:1 avalon 17:3 18:16 36:3 51:1,25 58:16 61:8 62:23 63:4 81:13 99:3,15 152:21 152:25 154:25 avoid 73:4 avoided 83:25 award 124:11 125:25 126:16 awards 49:20 aware 21:7,18 47:24 51:12 66:8 aways 94:12</p>	<p>156:5 background 19:2 119:22 bad 84:18,18 balancing 64:25 ban 98:6 banned 98:2 barely 89:16,25 barrel 76:11 82:21 barrels 76:10 76:10 82:8 83:2 barrier 110:18 bas 32:3 base 15:12 31:23 62:9 110:17,17 based 26:1 49:21 52:8 61:17 65:23 73:11 93:17 102:14 105:12 105:18 106:13 124:8,25 126:12,15 127:3,9 150:16 154:16 158:13 160:12 basement 93:7 basically 33:18 51:22 55:14 130:12 140:11</p>	<p>basin 34:20 81:14 97:5 117:16 118:18 basis 47:10 62:20 88:1 96:19 109:12 128:21 bear 10:17 155:9 becoming 32:8 began 114:18 beginning 29:14 35:15 40:13 behalf 49:7 115:5 147:18 believe 16:4 17:18 20:13,15 23:10 32:24 35:9 37:7 44:16 46:2 51:10 67:25 68:10,15 114:14 116:16 129:24 146:2 155:17 believes 125:11 bell 14:22 33:6 33:13 34:10 46:8 127:20 128:1 134:24 143:7 bend 103:19 beneficial 54:14 58:9,22</p>	<p>71:23 74:10 77:16 78:11 83:9 89:11,16 90:14 91:21 92:1 benefit 88:3,4 88:18 89:8 92:13 benefits 78:9 bennet 21:23 bennett 2:8 3:5 3:9,14 6:15,25 7:1,20 8:14 9:8 9:18 12:19 21:25 22:3,22 23:1,2 31:8 85:21,22 86:3 86:22 87:1,2,4 94:9 119:24 121:10 132:1,5 132:7,9 133:11 144:21 160:22 best 25:2 31:24 53:8 57:2 66:7 73:10 76:3,16 106:1,9 112:11 150:17 161:10 162:6 better 19:11 32:12 35:1 42:17 46:24 47:1 48:18,18 57:23,24 60:3 67:7 69:7 71:7 76:19,23 77:9</p>
b			
<p>b 4:1,5 5:1 9:10 56:19 back 10:25 22:8 29:18 35:24 40:25 46:14 60:6,16 67:7 81:8 83:13 84:25 86:8 95:7 96:7 101:1,8 102:25 104:11,14,15 104:19 109:18 114:7 115:8,24 128:15 141:2 150:9 154:8</p>			

[better - called]

<p>82:1 88:8 90:24 93:15 107:11 110:1 111:16 116:2 116:10,11 153:19 155:24 beyond 29:10 65:14,15 79:10 125:3 150:4 big 37:8 59:24 79:22 81:9 95:4 bigger 83:12 biggest 118:23 bit 54:22 64:4 96:10 105:7 107:23 110:7 110:12 113:1 113:22,25 136:18 138:13 148:5,18 bits 89:4 blessing 154:12 block 109:3 bloom 2:5 6:9 6:10 8:10 9:4 9:14 26:17,18 86:1,9,13 111:15,16,20 112:25 113:21 114:14 115:9 115:23 116:4 116:14,19 133:14 144:8,9 157:2,3 158:23</p>	<p>159:2,3 bloom's 146:21 blue 17:9 18:8 board 102:19 bobco 47:18 bog 111:6 bonding 77:22 bonds 77:6 bone 36:3,18 54:11 69:2,11 81:15 bopco 4:25 15:18 23:16 37:12 40:8,9 41:3,6 44:1,11 44:24 45:14,17 47:18 48:2,15 50:19 54:16 56:1 64:19 border 152:11 bore 68:17 bottles 109:19 bottom 14:15 16:20 56:17 69:9,10 73:19 73:20 75:21 76:1 77:6 134:7 139:4 bottomhole 75:18 boundaries 18:16 bounded 103:4 brandon 2:11 3:3 9:22 10:5</p>	<p>10:24 break 86:2,5 breaking 118:22 breather 94:24 breathing 96:11 bridging 47:22 brief 121:18 144:18 150:25 briefed 47:1 briefing 159:24 160:12 briefly 13:7,18 17:22 24:17 28:24 30:5 62:19 66:5 69:19 74:19 75:17 76:5,25 bring 48:6 98:14 128:11 brings 109:21 broke 76:9 brought 36:9 47:19,22 50:25 52:24 55:17 59:2 79:2 140:5 brushy 14:25 22:10 25:13,20 33:7,8,15 34:12 48:4 50:7 51:25 68:22,25 96:16 96:20,21,21,24</p>	<p>110:19 111:5 buffer 66:19 building 1:14 124:4 built 75:2 bullets 15:16 bureau 4:21 11:18,20 12:4 14:2 17:6 18:17 29:23 30:6 32:1 97:7 97:7 108:15,25 109:6 118:16 business 84:20 94:1 109:24 160:17 busy 104:22 147:9 buying 103:2</p>
			c
			<p>c 2:1 4:4,6,7 6:1 9:10 62:11 67:21 68:4 114:3 calculating 49:20 calibrate 143:23 call 6:7 9:22 27:25 28:2 119:12 124:5 126:21 160:18 called 10:6 28:9 120:8 137:12</p>

[calling - characterize]

<p>calling 6:4 71:10</p> <p>canyon 14:22 14:25 22:10 25:13,20 33:6 33:7,15 34:10 34:10 46:8 68:23,25 70:24 96:17 99:15,15 134:25,25</p> <p>canyons 127:21</p> <p>capacity 30:21 53:15 81:16 97:2 118:11,23</p> <p>care 86:15</p> <p>careful 152:10</p> <p>carefully 152:15</p> <p>carry 79:25</p> <p>case 4:3,5 6:13 6:14,17 7:3,4 11:24 14:19,20 36:6,20 37:6 37:12,23 38:9 41:3,3,4,6 43:15 44:7 46:7 50:18 54:17 56:1 58:5 59:12 60:16,18 61:10 64:19 67:14 72:5 96:18,19 98:19 102:18 102:21 109:6 114:1 122:7</p>	<p>124:20 125:1 126:1,17 127:6 128:3,5,10 134:14 136:7 136:12 143:6,6 143:6 149:21 155:2 158:9,19 159:10,14,17</p> <p>cased 46:22 47:11</p> <p>cases 4:25 7:23 9:12 15:18 29:15 30:22 32:19,22 36:7 40:8,9,17 44:4 44:11 45:3,4 48:15 50:18,21 51:20 62:15 63:18 75:20 77:10 78:8 91:13 98:9 111:3 127:17 149:12 150:1,3 156:15 157:13</p> <p>casing 47:1,7 70:23 71:1 73:25 83:2,7 103:8 138:15</p> <p>casings 127:21</p> <p>castile 67:16 69:11</p> <p>catch 87:17</p> <p>category 75:16</p> <p>cause 40:7,10 138:14</p>	<p>caused 35:22</p> <p>caution 40:23 153:2</p> <p>caveat 58:13</p> <p>cement 47:11 73:1,19,20 74:3</p> <p>center 38:8 69:1</p> <p>centered 16:14</p> <p>central 38:1,3</p> <p>centrally 15:12</p> <p>certain 27:11 34:19 42:14 45:19,21 58:6 60:5,9 61:6 72:18 84:25 111:3 124:18 148:6</p> <p>certainly 40:9 41:17 57:24 58:2,3 71:13 74:2,9 75:16 85:10 100:6,10 106:11,25 107:10 109:15 116:11 150:21 152:2 156:24 160:1</p> <p>certificate 161:1 162:1</p> <p>certify 161:4 162:2</p> <p>cetera 150:13</p>	<p>chair 2:3 6:3 9:20 21:20 26:10,18 28:1 31:3 85:18 86:1 114:22 131:23 140:22 147:22 155:16 157:4,17 159:14</p> <p>chair's 124:14</p> <p>challenge 151:21</p> <p>challenges 138:6</p> <p>chance 138:8 138:17 140:3</p> <p>chances 64:14</p> <p>change 8:18 95:1,4 97:21 97:22 114:5 125:22</p> <p>changed 8:21</p> <p>changes 60:3 73:7 101:14 124:18</p> <p>channeling 33:9</p> <p>characteristics 73:7 99:13 146:16</p> <p>characterizati... 29:17,20</p> <p>characterize 107:11</p>
---	--	---	--

[chart - collaboratively]

<p>chart 26:22 check 56:13 160:20 checklist 90:16 93:3 cherry 14:22 33:6,7 34:10 46:8 50:7 127:20 128:1 134:25 143:7 chevron 2:15 5:10,12 6:18 17:2,19 18:1,3 22:14 24:2,6 24:20,24 25:14 27:5 37:13 40:2 41:14 44:8 45:8 46:6 52:25 54:16 55:15 57:12 58:7,10 65:9 66:2 68:12 69:3 73:13 79:3 84:13 87:8,10 88:13 89:6,11 90:3,7 91:11,16,18,19 93:18,19,24 94:5 98:19 99:1,2 102:19 104:21 105:8 105:15 106:19 107:5 110:5 114:22 115:24 117:5 122:7</p>	<p>125:7 129:11 130:17 132:14 136:20 141:18 144:19,23 145:22 146:10 146:11,17 147:11 152:4 152:22 155:11 157:11,20 chevron's 14:22 16:4 17:15 20:19 24:7,14 26:22 42:6 44:25 58:4 61:6 65:25 67:20 68:1 79:20 81:2 88:10 89:17 99:5 126:20 131:7 132:25 143:13 146:6 147:18 151:5 152:25 156:15 chicken 87:17 chief 11:20 12:4 chiefly 78:17 chino 1:14 choice 140:9 choose 110:11 127:19 chooses 65:2 choosing 89:2</p>	<p>chose 88:22 112:12 chris 162:2,18 circle 38:3,7 circles 37:17 64:11 circumstances 19:25 133:7 cisco 70:24 81:13 cited 88:19 clarification 17:13 18:6 26:21 44:22 67:14 68:9,16 69:14 110:8 125:5 clarifications 135:19 150:12 clarified 100:18 clarify 13:14 26:21 48:12 70:12 75:12 77:24 78:6 110:10,13 123:17 124:14 133:24 134:24 136:17 139:21 142:18 148:19 150:6 clarity 141:1 class 30:8 39:19 101:15</p>	<p>classic 40:9 54:7 clean 71:4,22 cleaned 71:2 clear 102:11 141:5 142:10 147:24 149:10 156:19 close 22:11 37:8 51:11 64:20 150:11 154:19 closed 7:3,5 63:24 closer 113:19 closing 144:18 144:20,22 cluster 38:7 43:18 48:8 clustered 64:22 coal 30:3 coas 24:8 code 103:5 cogswell 1:21 161:2,20 collaborate 130:19 132:15 135:12 collaborating 126:22 collaboration 91:20,25 145:9 collaboratively 133:4</p>
---	--	--	---

[collect - compensate]

<p>collect 87:25 collection 146:7,8 collude 75:13 colorado 119:5 colors 155:13 combination 114:21 combinations 131:6 combine 106:24 146:5 combined 135:1 combines 17:24 combining 101:20 come 34:24 36:4 55:24 56:8 60:6,12 60:16 63:25 74:7 78:25 79:6 80:2 81:4 86:8 87:19 88:7 101:8 102:3,25 104:15,19 109:7 130:20 137:9,17,19 153:9 155:3 156:5 158:1 comes 80:2 103:20 105:2 comfortable 105:4,15 113:7</p>	<p>119:23,24 154:15 coming 13:13 94:17 95:6,7 102:7,19 104:14 107:18 107:22,25 109:3 110:2 118:6,8 119:5 128:2 129:14 147:9 commenced 124:4,17 commencem... 124:21,22 125:1,12 132:21 commencing 125:8 comments 144:20,22 commercial 45:15 94:5 commission 1:2 5:5 6:3,5 7:25 8:111:22 13:19 14:19 15:6 16:23 19:7 26:11 29:9 30:20,23 30:25 31:22 32:19 36:10 39:18 43:4,10 46:1 52:22 53:1,1 55:12</p>	<p>55:18 59:4,11 60:6,13,16 61:11 62:21 63:17,20,20 64:1,2 66:5 67:3 72:5,10 78:8 80:21 84:6,23 85:15 92:10,14 101:1 101:1,4,5,7,9 101:21 102:2,2 102:5,16 103:18 104:6 104:13 105:1 106:6 107:9,13 115:5 119:16 125:19 127:18 128:12 139:15 140:7 141:3,9 146:9,24 147:4 147:8,15 148:10,20 149:5,13,15,22 149:25 150:15 150:20,25 153:9,12,23 156:8,13,21 157:2 158:3,20 159:2,12 commission's 6:12 92:21 121:2 144:24 145:5 146:21 147:2 158:2</p>	<p>commissioner 2:3,4,5 6:7,9 81:21 86:9,13 142:17 146:21 153:16 commissioners 32:10 46:5 47:15 51:8 140:23 141:6 145:2 147:23 151:14,19 156:25 commissions 60:11 committed 146:17 committing 147:17 common 74:15 commonly 121:24 communication 51:25 68:12 companies 98:9 company 45:16 compare 135:12 compared 117:6 136:21 157:22 comparing 136:1 compensate 134:7</p>
--	---	---	--

[compile - conservative]

<p>compile 109:11 compiled 35:15 compiling 49:9 complaint 160:8 complete 58:12 74:2 91:9 completed 46:6 109:9 completely 47:11 completeness 122:14 completion 72:17 134:25 complex 33:5 107:24 109:18 110:10 complexity 32:25 87:21 126:3 compliance 29:2 41:18 78:22 109:8 111:2 complications 16:3 comply 93:14 component 145:18 152:9 composed 31:25 comprehensive 157:21,24</p>	<p>compromise 73:1 96:13 compromised 129:10 131:1 compromises 130:22 computer 10:16 55:10 concede 65:21 concept 51:17 59:3 103:17 concern 25:14 35:16 36:12 54:9 55:20 56:22 61:12 65:18 68:24 70:7 72:24 81:1,10 82:5 94:19 104:20 134:19 139:10 139:20 140:17 concerned 107:23 concerns 16:12 16:13 19:4 24:5 34:9 38:21 40:20 49:12 50:24 51:24 52:3 65:13 67:5,19 79:14,16 90:25 91:5 96:13 100:8 103:6 119:18 148:1</p>	<p>concluded 160:23 concluding 152:3 conclusion 94:11 concurrent 26:25 condition 84:21 101:13 103:24 104:4 106:2 111:1 155:18 conditional 97:21 125:15 conditions 5:8 19:6,10,11,15 20:11 24:19,22 26:12 42:2,4 56:10 57:3 60:25 61:7,22 74:25 78:19,24 79:13 96:2 101:19 102:16 104:10 105:25 113:5 115:7 121:22 122:25 131:15 148:22 151:6,9 154:22 155:5 156:8 158:2 conduct 74:8 123:14 124:7 125:7 conducting 125:12</p>	<p>conferring 27:8 confidence 57:14 59:22 63:6 102:23 confident 53:25 91:3 126:18 139:11 configuration's 97:23 confined 54:1 confining 50:22 63:9 67:15,16 68:8 69:3,7,16 110:19 111:12 confirm 98:5 confirmed 21:11 100:11 confirming 10:19 conflict 66:22 confused 110:12 connectivity 35:10 39:6 43:9 137:16 consent 29:22 29:22 conservation 1:2 6:3,5,21 7:25 9:21 11:11,15 28:21 30:20 85:1,14 120:22 159:12 conservative 41:9</p>
---	--	--	---

[consider - counsel]

<p>consider 41:13 43:4,5 60:10 90:15 97:5,6 97:13,19 99:21 106:22 141:7</p> <p>considerable 21:17</p> <p>considerably 50:8</p> <p>consideration 33:22 43:7 55:2 108:2 109:22 117:23 151:2 158:5</p> <p>considered 7:19 55:15 56:2 67:17 72:12 73:12 75:16</p> <p>considering 42:20 117:16</p> <p>consistent 90:8 97:4 116:10 149:17</p> <p>consolidated 4:8</p> <p>consternation 35:23 36:13</p> <p>constraints 53:16 61:17</p> <p>construct 6:18 129:12,13</p> <p>constructed 71:12 129:15</p>	<p>construction 70:13,14</p> <p>consulting 29:16</p> <p>cont'd 5:1</p> <p>contained 14:8 15:6 16:24 17:23 150:5</p> <p>contains 44:10</p> <p>content 43:10 80:10</p> <p>context 19:23 59:5 60:10 61:20 80:22</p> <p>continuance 158:16</p> <p>continue 94:2 155:2 158:8,19</p> <p>continued 7:25 89:24 155:2</p> <p>continuous 81:3</p> <p>contracting 68:19</p> <p>contractor 29:21</p> <p>contrast 135:12</p> <p>contribute 34:8 40:12 125:17 126:6</p> <p>contributing 45:14 152:5</p> <p>control 28:23 89:6 120:24</p>	<p>controls 46:25</p> <p>convenience 112:22</p> <p>convert 77:5,13 77:20</p> <p>converted 71:11</p> <p>cooperate 118:20</p> <p>cooperating 118:19</p> <p>cooperation 81:3 110:1</p> <p>cooperative 108:10</p> <p>coordinate 144:23 146:23 147:5</p> <p>coordination 145:8</p> <p>copy 88:21</p> <p>corner 44:2</p> <p>corporation 97:23</p> <p>correct 18:15 21:15 23:5,9 23:15,25 27:18 30:16 31:2 38:2,11,15 44:13 45:23 47:13,13 52:11 54:25 57:10 61:3,12 63:9 67:2 68:13,17 69:1,17,18</p>	<p>73:15,22 74:17 78:5 88:11 90:17 96:2 107:19 129:22</p> <p>corrected 68:11</p> <p>correction 68:2 68:21</p> <p>corrections 67:20</p> <p>correctly 20:13 56:21 57:6 61:10 68:10 132:22</p> <p>correlates 55:14</p> <p>correlation 40:17</p> <p>correlative 16:2,14,16,17 20:16 41:2 56:11 57:5 59:22 61:23 63:8 79:17 82:23 83:1 95:13 118:2 122:5,17 123:2 125:11,18 126:4,18 130:1 131:17 145:25 151:8 152:10 152:13 157:5</p> <p>cost 42:20 108:2</p> <p>counsel 6:23 144:19 147:6</p>
---	---	---	---

[counsel - definitely]

161:11,14 162:7,10 couple 21:25 22:6 83:16 100:19 116:5 132:12 133:16 133:22 135:19 145:15 148:17 course 33:10 43:23 74:10 99:22 146:10 147:3 150:18 court 9:25 10:19 120:3 160:12 courtesy 21:5 cover 128:9 coverage 129:9 covered 68:20 79:8 116:24 127:15 crater 130:24 create 97:3 created 35:5 77:17 creation 98:3 credentials 7:10 criteria 62:18 67:10 84:16 89:15 111:23 127:3 133:24 critical 66:12 76:2 80:11 99:23 109:13	cross 17:3 22:2 46:2,3,4 56:17 86:15 87:3 95:20 97:3 132:6,8 133:18 crossed 15:20 culmination 13:25 cumulative 4:23 14:15 35:14 current 11:10 11:12,17 15:3 25:18 28:20 40:20 53:19 55:21 70:6 71:3 83:24 97:16 105:10 113:3 114:8 120:21 currently 24:13 30:12 56:5 61:23 63:1 72:2 97:8,20 106:3 154:1 curriculum 30:13 121:5 cursor 38:9 curtailment 129:22 customary 101:15 119:21 cutting 53:5 cv 4:17	cx 3:2 d d 3:1 4:8 6:1 9:10,16 112:2 daily 156:1 dana 2:7 daniel 2:10 data 20:12 24:2 24:6,7 26:3,5,8 78:17 79:15 87:11,19,19 88:5 130:17 135:6 138:8,18 138:22 140:4 142:3 143:23 144:3,5 146:6 146:8,18 153:19 154:2 date 5:11 8:18 8:21 dates 27:11 114:7 day 1:3 6:4 7:2 46:19 72:17 76:10,10,11 82:8,21 83:2 97:17 138:10 160:21 days 66:9 134:17 157:11 157:19 deadlines 123:11 deal 114:1	dealing 32:7,13 32:25 deana 2:8 debate 64:11 92:19 debrine 2:9 decades 14:11 14:12 decent 119:4 decide 147:4 decided 153:19 decides 106:4 135:1,2 deciding 154:9 decision 27:17 58:19 65:22 88:1 101:9 105:1 107:11 160:12 decisions 109:13 declaration 8:6 declare 112:7 dedicated 93:19 deduction 89:13 deep 152:2,5 deeper 39:7 66:9 defend 54:16 deficient 40:16 definitely 22:6 91:2 106:20 141:12 145:8
--	--	--	--

[definitions - diameter]

<p>definitions 33:5</p> <p>deflection 127:23 142:2,3 142:7</p> <p>degree 30:9 48:24 57:13</p> <p>delaware 6:19 31:22,24 35:18 36:8,19,24 37:1,13 38:22 39:8 41:10 43:18 49:9 52:15 53:4 56:3 58:25 62:1 65:11 70:17 76:8,22 77:4,12 79:9 79:16 80:13,24 81:4 94:25 95:7 97:9,11 99:16 102:15 103:19 113:13 117:20 149:1</p> <p>deliberate 151:15</p> <p>deliberately 153:4,5</p> <p>deliberations 142:21</p> <p>delineated 39:3</p> <p>delivered 85:13</p> <p>delta 153:17</p> <p>demand 81:4 114:11</p>	<p>demands 35:19 95:9</p> <p>demonstrate 46:17,21 54:12 54:18</p> <p>demonstrated 55:25 64:6 152:22</p> <p>demonstrating 70:8</p> <p>demonstration 49:23 54:19 58:1</p> <p>denial 36:8</p> <p>denied 63:13</p> <p>deny 160:7</p> <p>denying 109:24</p> <p>department 117:21</p> <p>depends 134:4</p> <p>depict 57:8</p> <p>depicted 17:14 18:7 36:14 37:4</p> <p>depicts 129:18</p> <p>deploy 89:20</p> <p>deposition 113:18 161:1</p> <p>depth 18:22</p> <p>deputy 2:11 11:12,14,23 12:5 16:9 19:21 20:24</p> <p>describe 11:15 13:19 15:5</p>	<p>16:23 17:22 28:24 37:21 52:22 55:12</p> <p>described 17:15</p> <p>description 4:2 4:12 5:2 26:1 69:7</p> <p>designation 19:22</p> <p>designs 103:8</p> <p>desire 93:9 132:14 146:6,7</p> <p>despite 127:1 148:12 150:14</p> <p>destroyed 129:10</p> <p>detail 32:17 62:13,23 74:19 99:8 157:18</p> <p>detailed 48:6 52:8</p> <p>details 29:8 32:11 150:12</p> <p>detection 131:2</p> <p>determination 148:8</p> <p>determine 53:3 121:25 129:25 133:25 135:4 143:10</p> <p>determined 17:11</p> <p>develop 19:16 84:16</p>	<p>developed 33:13 42:18 47:19 66:10 123:17</p> <p>developing 155:23 158:15</p> <p>development 19:3,13 118:14</p> <p>deviation 129:16 130:14</p> <p>devonian 42:15 61:24 62:4 66:10 72:5 75:20 80:4 81:9,12 82:12 94:18,22 97:10 109:3 112:15 118:14</p> <p>dfit 15:1 25:14 75:14 90:13,18 90:20 91:5 105:24 126:21 135:3 136:19 136:21,25 138:13,14 139:12,21,25 139:25 140:9 140:15,15 141:11</p> <p>dfits 54:8,8,12 55:3 135:2 138:16 139:17</p> <p>diagram 68:17</p> <p>diameter 83:7 97:14</p>
---	--	--	--

[dictate - division's]

<p>dictate 142:8</p> <p>difference 88:14 136:24</p> <p>differences 45:25 87:20</p> <p>different 14:11 14:12,12 15:16 88:22 89:2,24 90:23 97:23 107:25 117:17 119:19 130:9 145:11 146:14 146:15,15,16 146:16 155:13</p> <p>difficult 34:13</p> <p>difficulties 66:8</p> <p>digital 161:8 162:3</p> <p>diligence 146:6</p> <p>dimensions 71:25</p> <p>diminish 72:23</p> <p>direct 7:9 10:11 13:1 21:21 28:13 35:8 49:1 52:18 62:17 63:7 85:18 86:19 120:13 123:5</p> <p>direction 53:9 75:9 101:21 115:3</p> <p>directives 35:7</p> <p>directly 12:3 141:2</p>	<p>director 2:11 11:12,14,23 12:5 19:21 20:24 49:7 85:8,8 115:4</p> <p>director's 16:9</p> <p>disclosed 99:19</p> <p>discover 22:16</p> <p>discovered 27:8</p> <p>discretion 136:6</p> <p>discuss 6:24 24:17,18,21 52:13 91:2 142:12,20</p> <p>discussed 22:9 24:20 44:25 52:15 75:11 90:1 125:3 145:1 150:4</p> <p>discussing 34:7 43:2 58:6 128:24</p> <p>discussion 34:1 34:25 40:1 46:19 53:7 55:1 65:24 68:15 69:23 72:9 84:10 93:1 140:25 149:4 150:9 152:6 158:8</p> <p>discussions 24:24 25:1</p>	<p>110:17 158:14</p> <p>dismal 70:25</p> <p>disposal 6:18 16:1 23:13,24 35:18,25 36:20 42:19 45:6,16 46:7 59:1,5 66:23 67:4 70:17 74:6 77:5,20 79:11 79:19,25 80:19 81:5 88:24 89:1,16 94:15 94:24 97:2,16 101:16 102:9 112:23 114:6,9 118:10,21,22 122:11 145:13 145:17,19,24 146:12 148:2,4 148:12 151:24 152:2,20,23 153:9 158:15</p> <p>disposals 15:11 77:2</p> <p>disposed 118:11</p> <p>dispute 17:16 17:18</p> <p>dissolved 98:10</p> <p>distance 42:1 64:18 65:1 66:4 112:3,9 113:10 118:10</p>	<p>distancing 41:24</p> <p>distinction 72:11 136:19</p> <p>distinguishing 70:13 96:16</p> <p>dive 19:9</p> <p>diverse 33:8</p> <p>division 9:21 11:11,15 23:20 24:11,18,22,23 28:21,23 29:12 36:9 39:5,11 40:24 41:15 42:11 43:16 49:18 52:14 59:10,11 60:6 60:16 63:1,16 63:19,21 76:17 85:1,12,14 87:6,10,18 89:19 91:4,21 92:9,16 94:14 94:15 100:4 102:6 104:16 104:25 112:12 120:22 132:15 133:1,5 135:13 145:19 146:9 146:18 148:23 149:6,21 153:11</p> <p>division's 24:25 42:16 93:9</p>
---	--	---	---

[dmg - effort]

<p>dmg 4:20 13:22 14:10,11,14,16 15:9,11,12,17 15:19 16:1,2 16:13 18:13 22:15 23:23 32:1 35:20,24 39:13,15,19 42:1 43:6 44:21 48:14,17 49:12,16 51:25 52:7 53:11,15 57:21 59:13,15 61:1 64:15,18 64:21 65:3,14 66:9,18 69:21 70:1 74:16 75:5 77:1 82:16 88:21 93:7 96:4 97:2 97:3,4,15 98:2 98:6 99:3,10 100:11 106:14 111:4 113:3,24 114:3 117:25 125:11 126:1 135:6,8 145:17 145:24 148:12 151:24 dmgs 67:12 79:18 docket 145:7 158:13 document 12:11,14 31:23</p>	<p>77:25 78:7 101:18 148:21 156:20 documentation 31:24 36:25 doing 15:1 24:7 25:17 29:8,17 29:19 30:6,12 48:25 51:18 56:2,9 70:5 112:8 113:12 117:10 142:13 143:9 150:7 153:5 doorstep 118:9 doubt 22:18 downhole 47:6 74:13 106:11 dr 25:9,11 69:5 100:15,16 111:17,18 113:21 117:1,4 118:16 121:8 135:17,18 137:3,6 139:19 141:14,21 142:10,23 153:16 154:8 157:15,17 158:24 159:1 draft 157:10,13 158:20 drafting 158:5 dramatically 73:7</p>	<p>drill 20:5,6 drilled 15:2 100:2 drillers 106:11 drilling 14:23 16:3 33:15 36:19 70:22 77:10 95:5 drinking 146:1 drive 1:15 drivers 16:18 80:17 drives 148:7 dry 97:3 due 79:13 87:20 143:4 duly 10:6 28:9 120:8 161:5 duties 11:15 28:25 29:1 dx 3:2 dylan 1:8 2:3 6:3</p>	<p>109:1 132:13 134:3 149:16 early 102:9 127:23 129:2,5 129:25 131:1,2 142:2 159:24 160:13 easy 129:12 economic 4:21 32:1 70:23 118:16 economical 138:7 edge 152:17 education 4:14 11:22 12:6 29:10 30:10 121:15 educational 108:21 effect 40:10 64:21 65:6 80:18 effectively 71:12 83:7 effects 37:1 57:24 efficiency 58:3 efficient 150:17 efficiently 42:19 effort 35:16 39:14 42:15 48:5,22 49:11 55:16 77:8</p>
		e	
		<p>e 2:1,1 3:1 4:1,9 5:1 6:1,1 7:7 7:12,14 9:10 28:19,19 162:2 162:18 earl 2:9 earlier 12:5 23:19 33:14 66:9 86:17 87:22 90:1,13 91:15,18 93:8</p>	

[effort - examples]

<p>88:7,23 93:24 96:8 138:21 efforts 34:12 36:4 147:17 egg 87:17 either 36:7,9,18 56:22 60:17,17 63:14 84:2,7 92:22 111:10 112:8 115:2 128:7 139:22 139:22,23 144:11 element 70:9 156:10 elements 156:14 elevated 85:15 eliminate 66:25 eliminated 40:7 emphasize 80:3 empirical 130:16 employed 161:11,14 162:8,11 employee 161:13 162:10 enable 153:7 encounter 106:10 encourage 156:11 encourages 47:2</p>	<p>ended 35:22 86:19 ends 112:21 energy 117:21 engagement 27:4,4 engineer 134:21 engineering 11:13,17,20 12:1,4 31:1 121:3 122:16 129:2 enhanced 36:23 91:3 99:10 ensure 20:16 54:1 97:4 122:16 133:5 151:7 ensuring 16:15 entail 47:25 entire 130:13 entirely 114:6 141:17 149:6 entirety 13:21 environment 32:6 122:18 157:7 environmental 11:13 29:19 environments 34:11 envision 114:4</p>	<p>envisioning 132:20 eor 36:23 epa 29:3,22 49:19,19 78:22 83:23 135:23 equals 90:6 er 54:9 es 161:4 especially 32:7 36:3 48:22,25 49:9 67:6 70:20 71:17 75:5 82:12,13 95:1 108:25 109:2 110:2 116:12 132:19 essentially 16:11 66:24 establish 42:16 59:12 92:8,9 104:4 135:8 established 59:21 155:4 establishing 77:1 80:12 estimate 106:1 134:25 estimation 25:18 66:7 et 150:13 evaluate 19:16 23:23 114:24 evaluation 70:6</p>	<p>evaluations 49:8 event 43:17 61:1 events 71:3 eventually 45:18 evidence 7:15 8:13 9:7,17 12:22 31:12 86:25 111:25 121:13 132:4 145:22,23 146:2 152:19 evolution 94:13 exactly 124:19 129:10 131:13 154:23 examination 10:11 22:2 28:13 85:18 87:3 95:20 120:13 132:8 133:18 examined 10:8 28:11 120:10 137:14 examiners 23:10 31:23 32:11 example 37:7 40:10 106:16 115:17 154:25 examples 59:11 89:3 135:25</p>
---	---	---	---

[exceed - fact]

<p>exceed 42:3 112:17</p> <p>exceeded 41:3 84:3 91:13</p> <p>exceeds 58:12</p> <p>except 154:1</p> <p>exclude 112:22</p> <p>excluding 96:22</p> <p>exclusion 23:6 64:5 67:12 152:18,21,25 154:25</p> <p>exclusionary 16:1</p> <p>excused 116:25 119:8 144:12</p> <p>exhibit 4:3,5,7 4:8,9,10,14,16 4:17,18,20,23 4:24 5:4,5,7,8,9 5:10,12 7:14 7:21 8:12,17 8:22,23 9:6,6 9:16 12:7,8,17 12:21 13:2,3,5 13:19,20 14:5 20:22 22:8 30:11,14 31:4 31:11,17,18,20 35:9,10,11,12 36:15 37:11,22 43:11,12 44:10 44:17 47:15,17 47:18 49:1,3,5</p>	<p>49:6 51:7 52:19,20,23 55:7,8,11 57:17 60:21,22 61:19 62:14 77:23 78:16 80:11 83:5 86:24,24 93:2 93:4 96:1 97:19 98:4,11 98:15 99:1,5 106:15 111:22 113:6 121:4,6 121:12,20,20 122:20 123:6,8 123:10 124:24 128:13,15,16 131:24 132:3 136:22 148:17 148:20 154:12 154:23 155:8 156:14,17 158:11,21</p> <p>exhibit's 31:9</p> <p>exhibits 4:8,24 7:3,5,7 8:10,17 8:17 9:1,2,5,9 9:11 22:5 31:15 44:11 69:23 86:18,20 86:23 93:18 98:20 122:19 122:22 131:16 131:20 149:9 150:5 155:12</p>	<p>157:12</p> <p>existing 39:12 42:7 44:6 47:23 64:13 70:13 77:1,4 77:12 83:5 101:20 148:25 149:11</p> <p>expand 88:23 88:24</p> <p>expanding 65:15 66:1 118:12</p> <p>expansion 58:25 68:18 94:3</p> <p>expansive 80:25</p> <p>expect 94:1 136:12</p> <p>expectations 91:12</p> <p>experience 4:15 11:22 12:6 29:10 30:10 42:11 61:13 65:9 121:16 138:19</p> <p>expert 13:10 30:25 31:5 119:17 121:3 143:22</p> <p>experts 13:13 108:11</p>	<p>explain 37:16 64:17 66:5 121:21 125:19 128:21</p> <p>exploratory 20:4</p> <p>exponential 81:1</p> <p>expressed 147:25</p> <p>extending 51:20</p> <p>extensive 45:10</p> <p>extensively 23:11</p> <p>extent 153:22</p> <p>extreme 62:5</p> <p>extremely 19:24</p> <hr/> <p style="text-align: center;">f</p> <hr/> <p>f 4:10 7:22 8:2 8:7,12 9:10</p> <p>faced 50:13 82:17 89:20 133:7</p> <p>facilitating 35:20</p> <p>facilities 39:17 39:22 66:11,14 66:20</p> <p>fact 13:11,12 50:6,13 51:2 60:12 69:23 70:1 79:8 88:21 89:5</p>
---	--	--	--

[fact - floyd]

<p>90:7 112:16 114:7 117:25 127:1 143:22 148:25 factions 153:7 factor 45:14 51:13 126:10 126:11 134:1 134:10 135:20 135:23,25 factors 124:11 125:15 facts 8:6 84:5 124:25 150:3 factual 60:10 61:20 failure 70:25 fair 17:13 27:14 40:19 43:1 47:9 49:16 52:1,6 60:9 62:24 73:19 80:6,10 91:14 93:4,6 93:11 fairly 7:5 58:11 fall 51:18 fallout 54:18 false 70:1 familiar 90:18 99:4 100:6 112:1 122:21 far 15:19 18:22 27:10 31:21 33:8,20,24</p>	<p>43:9 48:8 59:23,24 63:7 71:8 82:14,14 84:19 90:24 93:15 130:25 134:19 152:20 160:3 farther 29:18 62:1 149:8 fast 118:9 faster 116:10 138:7 faulting 55:25 57:25 faults 56:22 57:8,14 83:19 99:4,11 112:1 favorable 118:1 fe 1:16 feasible 20:14 features 33:9 33:20 79:15 federal 46:20 71:15 feedback 141:11 154:17 156:9,17,24 feel 24:9 53:25 63:6 72:22 100:16 105:11 105:14 143:18 145:1,16 151:14</p>	<p>feels 61:10,21 114:17 148:24 feet 111:6 139:4 fell 84:4 fellow 151:13 153:15 156:24 felt 53:8 61:15 88:25 112:16 field 45:8 fifth 43:21 figure 32:23 33:17,18 46:3 55:18 115:14 figures 32:5 34:7 filing 44:4 fill 15:12 76:17 104:16,17 filled 66:17 final 7:21 9:9 9:10 46:16 85:5 115:18 finally 44:4 117:20 financially 161:15 162:11 find 56:25 60:3 60:3 71:4 72:5 78:10 99:10 100:8,8 104:17 105:3 113:11 findings 92:21 fine 111:3</p>	<p>finite 82:12 fire 33:20 firm 29:17 firms 29:19 first 6:24 7:7 9:22 10:6 14:4 28:9 44:3,18 49:11 90:4 103:24 115:24 120:8 148:22 fits 112:11 five 17:21 72:5 72:6 78:23 112:10 133:25 134:10,15 136:3 fixes 151:25 flag 155:7 flaring 66:15 flexibility 132:18,24 flexible 135:24 flipped 155:10 floats 99:14 flood 36:21 floor 1:14 80:12 149:25 flow 17:3 26:22 54:19,19 56:4 56:11,24 99:17 flowing 129:4 flows 34:17 64:6 floyd 162:2,18</p>
---	---	--	---

[fluid - fuge]

<p>fluid 82:15 111:6 122:4 focus 79:19 129:18 focused 45:6 focuses 32:20 focusing 121:19 folks 49:22 53:8 71:16 104:22 116:12 follow 45:11 87:9 102:6 121:24 following 10:15 71:19 72:4 follows 10:8 28:11 120:10 137:14 156:6,7 foot 49:20 111:7 foregoing 161:3,4 162:4 forewarned 116:9 forget 116:17 form 16:10 68:5 147:1 formation 15:1 25:15 47:22 49:17 50:2,20 51:4 72:22 75:5,6 84:3 90:24 105:24 110:6 113:17</p>	<p>125:8 128:1,1 130:4 formations 14:21 33:3,12 50:16 127:22 128:4,10 formed 16:9 78:1 former 83:21 formula 112:9 forth 78:4,25 149:9 150:9 154:8 forward 48:17 56:8 59:15,18 76:17 80:12 88:7 92:9,17 94:2 103:17,19 147:7,18 found 93:1 155:14 foundation 92:18 four 15:18 16:22,24 44:20 64:24 73:17 75:12 81:7 106:16,17 129:17 frac 51:10 126:21,23 135:9,10 136:21,24 137:15,25 138:19 139:20</p>	<p>139:21 140:7 140:12 frac's 141:12 frack 72:12 fracked 50:16 fracking 50:21 54:14 fracs 136:19 140:8 fraction 82:24 fracture 47:23 56:22 57:25 73:6 99:19 112:1 128:6,8 135:8 fractured 50:23 73:6 fractures 57:9 57:14 73:14 106:13,21,23 francis 1:15 frankly 79:10 free 27:23 66:25 frequency 84:12,21 116:2 friction 126:15 134:4,5,6,8,13 134:14 frictional 136:5 frictions 134:22 front 67:8 105:23 114:1 116:11 127:8</p>	<p>128:14 frugal 85:10 113:10 fuge 1:8 2:3 6:2 6:3,9,11,16 7:16,19 8:9 9:3 9:5,13,15,19,25 10:9 11:2,7 12:18,20 13:8 13:14 21:22 25:6,9 26:17 26:20 27:14,19 27:25 31:7,9 37:15 80:8 85:20 86:4,8 86:21,23 87:1 95:17 98:14,22 100:15 111:15 116:23 117:2 119:8,10,14 120:2,11 121:9 121:11 123:15 123:23 131:20 131:25 132:2,5 135:17 137:2,4 137:7,19,23 140:19 142:17 144:8,11,17 147:20 150:22 151:11,17 157:16 158:7 158:24 159:2,4 159:16,20,23 160:2,5,10,14 160:16</p>
---	---	---	--

[full - go]

<p>full 126:7 147:17 fully 143:19 function 87:23 funding 29:4 funds 85:11 further 24:20 26:16 27:19 80:3 116:16,21 130:3 131:19 144:15 147:14 161:13 162:9 future 16:17 17:7,10 18:23 19:8 43:6 58:24 63:24 78:8,19 100:1 108:3 129:11</p>	<p>gather 18:25 20:2,6,16 23:22 24:3,10 135:7 gathered 24:12 125:21 gathering 20:12 24:6,7 26:3,5,8 65:10 80:1 88:5 142:4 gauge 138:2 gebremichael 2:14 3:12 119:13,15 120:2,7,16,20 121:2,5,17 122:6 124:1 127:13 131:14 133:20 138:4 138:23 139:1,8 139:18 140:16 141:2,13,19,23 gebremichael's 4:17 gebrmichael 135:21 136:1 136:11,16,23 142:14,16 143:1,3,16,20 144:4,6 general 27:11 27:12 64:13 87:14 122:11 124:1,15</p>	<p>125:20 141:8 141:10 149:19 149:23 150:2 generalized 149:18 156:20 generally 48:14 57:13 122:13 124:3,16,24 125:24 149:2 geographical 52:9 geologic 71:8 geological 30:2 52:9 122:15 148:6 geology 4:21 14:2,9 17:6 18:18 30:9 31:6 32:1 33:2 34:2 87:21 88:14 97:7,8 108:15 118:17 146:15 getting 37:8 41:25 42:5 54:13 55:19 113:24 117:12 127:7 138:8,17 153:19 give 32:18 59:3 69:8 70:2 76:4 86:9 89:19 102:20 104:15 105:23 109:16 125:13 130:18</p>	<p>given 19:2 32:4 49:7 62:25 84:5 94:14 103:14 125:9 139:2 148:24 gives 31:23 32:12,24 58:18 59:18,21 65:20 104:13 115:12 115:13 138:10 giving 115:3 116:7 151:1 glad 160:19 go 8:20 13:20 18:22 20:5 21:16 23:11 27:24 32:9,15 37:7 50:10 53:9,22 58:20 59:10 64:3,10 70:4,7,18 72:3 72:4,7,7 78:11 83:12,13 85:6 86:10 96:7 101:2 103:17 104:9 111:10 111:22 112:12 114:20 115:2 128:7 129:13 130:4 134:9 135:6,13 136:14 138:15 139:25 140:9 152:20 160:7</p>
g			
<p>g 6:1 28:19 98:4 gaining 140:3 gap 129:8 gaps 71:16 76:17 gas 29:5,24 30:3 39:19,22 42:12 62:5 65:17 66:6,7 66:11,13,19 67:1,6 75:21 79:5 101:17 102:7 103:12 gate 80:1 116:9</p>			

[goal - group]

<p>goal 93:9,9 130:21 132:25 134:17 135:7 goals 24:14 goes 8:6 14:9 15:8 27:9 33:19 47:7 59:25 67:24 69:1 93:16 148:15 153:20 goetze 2:12 3:7 28:3,8,15,16,18 28:20 30:10 31:5,14 32:14 33:25 34:21 35:8 36:11 37:21 39:24 41:12 42:6,25 44:9 45:3 49:5 51:5 52:1,18 55:6 56:13 59:2 60:24 62:12 68:9 71:10 74:4 76:25 77:23 79:7 80:6 81:18 83:15 85:23 86:18 95:22 100:23 102:4 104:1,7 105:17 106:8 106:25 107:3 107:14,19 108:6,18 110:14 111:20</p>	<p>112:5,6 113:7 113:9 114:5 115:2,10 116:1 116:6,17,25 117:3,12,15 119:9 146:25 156:1 goetze's 4:16 going 6:6,21,21 10:25 24:3 25:20 26:1 29:18 31:14 32:9,15,18 37:10 47:6 48:21 49:1 54:21 55:6,11 56:6,7 58:15 58:17,25 59:14 59:17 63:11,13 64:15 65:3,4,5 72:14 74:18 75:24 79:4 80:8,11 82:17 84:14,15 86:6 89:25 96:11 102:2,15 103:18 104:4 104:22 106:4 106:10,19,20 106:22 107:18 108:7 109:11 109:13,18,23 110:1,3 111:6 111:7 112:16 112:25 114:6</p>	<p>115:8,12,17 116:7,12 118:17 121:1 126:9 128:7 129:18 130:12 130:15 133:25 134:9 135:3,11 135:15 138:21 139:13,17 141:15,17 142:8,9,11 151:25 152:1 153:4 155:8 158:14 goings 153:20 golden 77:14 good 6:2 10:13 28:16 42:2 50:11 53:20 56:24 58:1 60:20 64:20 73:24 76:3 82:21 84:12,20 88:24,25 89:3 91:17 93:10 102:6,17,24 106:11 108:10 116:5 120:15 125:13,15 126:23 129:24 135:5 138:8,18 138:22 140:3 150:8 154:2,3 160:14,21</p>	<p>govern 142:8 grade 75:3 gradient 49:20 50:4 124:9 126:1 128:9 135:8 gradients 128:6 grading 5:6 53:2 graduate 30:8 grail 75:19 grain 51:10 grant 29:4 graph 142:1 153:17 graphs 142:7 great 91:4 94:4 138:23 152:12 160:21 greater 48:7,23 58:3 65:7,20 66:3 81:14 105:23 142:12 greatest 58:18 70:16 green 17:9 greg 2:5 ground 87:20 group 6:19 11:18,19 12:3 29:13 31:22,24 35:18 36:9,19 36:24 37:2 39:9 41:11 43:18 49:9</p>
--	--	---	--

[group - highlight]

<p>52:16 56:3 62:2 65:12 70:17 75:9 76:9,22 77:4 77:13 79:9,16 80:14,24 81:4 94:25 95:8 97:3,11 99:16 102:15 103:19 109:6 113:14 117:20 120:25 149:2 groups 11:19 growing 15:25 118:9 guess 82:5 89:2 92:14 94:10 106:9 153:15 154:7,19 guidance 33:6 84:15 92:17 103:13 104:5 104:14 116:7 123:17,19,21 124:15 142:19 147:14 153:6 153:12 156:13 156:20,23 guide 59:19 guideline 78:3 78:7 149:23 guidelines 19:6 60:25 61:22 78:15 79:8 127:16</p>	<p style="text-align: center;">h</p> <p>h 4:1 5:1 half 42:7 72:6 112:13,17,20 112:24 hall 1:13 128:22 160:19 hall's 45:11 54:23 128:18 129:12,17,24 130:7,10,11 131:9 143:24 hammer 150:12 hand 10:3 28:5 69:4 93:16,16 120:5 handle 81:11 96:6 154:3 handled 96:18 153:10 happen 14:24 155:11 happened 15:10 44:15 happens 112:19 114:9 happy 116:19 130:24 hardy 2:7 3:10 3:15 7:18 25:6 25:8 94:7 95:17,19,21 98:17,23 133:14,16,19</p>	<p>135:15 146:23 150:22,24 158:22 hazardous 62:7 heading 75:10 heads 113:23 hear 10:20,21 33:25 57:6 132:22 137:21 heard 10:22 19:18,20 20:19 55:2 65:23 80:17 91:18 108:8 114:17 132:13 148:13 156:12,18 157:11 hearing 1:3,13 4:8,10 6:5 7:22 7:24 8:7,16 25:23 40:25 43:3 58:21 64:3 72:8 74:15 78:1,13 79:15 83:14 84:6 85:6,9 96:3,14 101:4 104:25 113:1 144:25 147:24 148:14 150:9 150:10 151:1 158:7 hearings 7:23 8:3 42:16 63:14,17,17,19</p>	<p>63:20 67:3 87:7 112:15 145:9 153:11 heavily 99:12 heavy 99:21 hello 95:22,23 133:20,21 help 76:19 108:3 126:7 129:25 130:8 143:9 helpful 22:5 75:24 93:2 146:24 147:5 helping 157:6 helps 41:16,17 113:25 hereto 161:15 162:11 hesitation 100:7 heterogeneity 126:2 127:6 143:5 high 13:24 17:7 17:8 18:4,9,11 18:13,17 25:20 33:16 38:21 higher 48:10 74:9 84:21 134:13 136:21 140:4 highlight 14:18 32:19 47:15 51:7 52:2,25</p>
---	--	---	--

[highlight - individual]

<p>53:13 55:16,24 62:17 highlighted 19:4 79:14 hills 51:10 historical 15:9 57:20 71:3,14 81:6 82:7 125:9 historically 34:10,13 50:5 70:18 74:6,23 75:1 87:23 96:23 104:8 118:24 histories 36:7 history 13:12 14:11 16:7,10 19:3 35:17 53:17 89:13 127:5 hold 67:7 135:15 holders 146:19 hole 46:10,22 71:22 75:21 76:2 109:4 138:1 holes 47:6 honestly 67:3 hopeful 147:12 hopefully 56:9 hopes 118:6 hoping 59:3</p>	<p>horizons 94:21 horizontal 22:10,11 33:14 44:20 45:15 47:20 54:8,11 72:16 95:5 huge 134:5 136:5 147:13 hydrology 143:22</p> <hr/> <p style="text-align: center;">i</p> <hr/> <p>ideal 8:19 identification 12:9 13:4 30:15 31:19 35:13 43:13 49:4 52:21 55:9 57:14 60:23 62:25 121:7 123:9 identified 17:1 18:4 23:3 25:21 94:18,20 127:5 identify 37:22 62:19 92:5 110:19 130:8 131:10,11 identifying 26:23 117:4 image 63:24 imagine 108:10 impact 56:3 65:14,25 100:9</p>	<p>impacted 41:20 impacting 111:11 134:18 impacts 77:9 131:11 impairing 125:10 implications 151:3 important 59:20 109:16 145:2,18 151:22 152:16 154:14 impressive 35:21 improving 69:10 inactive 44:19 inch 83:2 136:7 inches 72:1,4 incidences 35:22 include 29:3 48:23 63:20 67:15 104:1 111:24 included 54:23 67:22 110:20 122:22 includes 4:4,6 36:22 83:24 152:2 157:7,10 including 45:11 62:4 90:15</p>	<p>97:19 146:25 inclusion 20:11 55:3 inclusive 77:25 inconsistent 50:14 incorporate 41:13 83:22 92:16,16 101:12 113:5 156:25 incorporated 156:16 increase 50:3 50:12 116:2 124:6,6 129:7 130:23 increased 35:19 76:1 increases 49:15 50:16 51:3,3 increments 126:7 incumbent 153:11 154:5 independently 158:11 indicate 88:23 indicated 90:14 99:18 indication 129:4 individual 105:18,19 135:2</p>
--	--	---	--

[induced - injections]

<p>induced 62:4 industry 51:24 60:15 91:19,25 92:3 95:5 98:2 103:10 107:4 industry's 109:15 inform 53:17 129:20 157:12 information 4:19,23 13:25 14:1,1,1,8 15:6 16:24 17:23 18:20,25 19:1 20:2,6,16 21:11 23:23 24:10,12,21 25:2 26:7 32:4 32:17 33:2 34:16,25 35:15 38:18,23 39:1 40:14 41:13 43:2 45:10,12 47:19,21 48:1 48:6,18,24 49:10,22 50:4 50:6 51:13,14 51:23 52:9,10 53:24 54:15,20 56:1,6,8 57:8 57:11,18,21 58:10,19 60:18 61:22 62:2,4,9 62:25 63:2,5 65:10 66:10</p>	<p>69:24,25 70:2 70:6 71:9,15 71:18 73:11 74:9,14 75:7 75:20 76:2,19 77:7 80:20 84:25 85:24 87:15,20,24 88:19,25 89:4 89:19 92:15,22 95:3 98:8 99:22 101:13 101:24,25 102:9 105:3 107:10 108:25 109:3,11,12,17 113:20 116:13 125:21 127:7 128:22,23 141:8 148:6,9 149:1,20 150:2 150:16 informative 151:13 informed 21:18 informing 21:6 infrastructure 79:23 infringe 122:5 infringement 126:4 129:6 130:1 infringements 125:10</p>	<p>inherit 70:19 inherited 30:1 inhibited 15:21 initial 36:5 74:25,25 initially 27:7 37:1 inject 67:25 96:3 102:13 122:3 127:25 injected 66:25 67:1 109:5 117:7,19 122:4 143:15 144:1 injecting 127:21 129:3 injection 13:22 15:17,19 16:2 16:11,14,16 26:5,7 28:22 31:1,6 32:8 33:24 34:11 35:1,20 37:2 37:14 38:19 40:6,22 41:21 44:3,21,24 45:19,20 47:4 47:10,12 48:14 49:13,15 50:17 51:16 52:7 53:3,11,18 54:1,2,9,13 56:3 57:4 59:13,15 60:7 61:7,24 62:6</p>	<p>63:3,8,22 64:14,15 65:3 65:12,14 66:9 66:14 67:11,18 68:5,7,8,18 69:9 71:25 73:8,9 76:16 79:4 80:24 81:19 83:6,8 83:18 84:7 99:20 100:11 106:1,4 110:15 110:20,22,24 111:23 117:25 118:3,8 120:24 121:4 122:1,2 124:4,6,13,22 125:2,7,8,13,17 125:22 126:7 126:25 127:2,6 127:8,20 128:9 129:19 130:3,5 130:9,13 131:9 132:19,21 134:21 135:4,5 138:11,16 142:9 143:8,11 151:6 155:17 155:17 injection's 124:17 injections 34:19 45:21 74:21 76:1 99:16 134:20</p>
---	--	---	---

[injectivity - issues]

<p>injectivity 93:10</p> <p>injector 130:18</p> <p>injects 90:21</p> <p>input 109:16</p> <p>inquiries 77:3</p> <p>inserts 18:1</p> <p>inside 18:5 58:16 111:3</p> <p>insist 142:11</p> <p>inspection 11:19 101:14</p> <p>installed 74:1</p> <p>instance 40:8 43:18 60:5 61:24 63:23 68:14 108:8 117:18 136:7</p> <p>instances 38:13</p> <p>instruction 114:24</p> <p>instructions 11:1</p> <p>intact 45:10</p> <p>integrity 71:20 73:1</p> <p>intend 27:20 78:2</p> <p>intended 13:21 23:6,7 74:4 78:17 86:17 122:4 129:4 130:14</p> <p>intending 13:9</p>	<p>intent 46:7 68:1 93:4</p> <p>intentional 38:13</p> <p>interest 15:25 45:7 52:17 53:10 75:23 89:23</p> <p>interested 42:21 67:8 105:13 107:7 141:12 161:15 162:12</p> <p>interests 53:9</p> <p>interfere 57:4 82:16</p> <p>interference 20:21,25 21:1 21:4,10,12 26:23 27:1 36:18 38:10,14 40:3,6,8,13,22 51:1 64:6 78:20 99:2 127:5 148:15</p> <p>interim 146:15</p> <p>internal 148:20</p> <p>interpretation 50:21</p> <p>interpretations 32:4</p> <p>interrelations... 33:4</p> <p>interrupted 30:5</p>	<p>interruption 35:10 39:6 43:9 123:16 137:16</p> <p>interval 32:7 33:24 35:25 39:8 46:23 51:21 54:2 63:9 66:18 67:11,13 68:18 97:16 109:9 110:15,20,22 110:24 111:3 111:23 112:23 125:8 138:13 139:11</p> <p>intervals 16:17 39:16 46:7 76:16 139:3</p> <p>introduced 131:20</p> <p>introduction 119:22</p> <p>introductory 14:6</p> <p>invest 88:7</p> <p>investigation 35:4 101:23</p> <p>investing 79:22</p> <p>investment 84:19,20 107:6</p> <p>investments 66:12</p> <p>involved 116:12 126:16</p>	<p>involvement 27:2</p> <p>ipr 124:6</p> <p>irregular 50:14</p> <p>isolate 130:8</p> <p>isolated 34:12</p> <p>isolation 117:19</p> <p>issuance 38:21 39:15 41:10</p> <p>issue 38:10 41:16 58:2 63:6 69:15 73:4 76:21 82:17 101:2 105:4 109:9,25 114:12 115:17 118:18 119:3</p> <p>issued 29:5,15 40:24 60:19 83:22 156:8</p> <p>issues 15:25 34:19 35:21 36:19 41:3 44:1 46:25 49:13 50:14 55:21 58:2 59:24 64:9,21 66:15 73:25 74:13,17 83:12 100:8 105:11 108:9 118:14 127:4 130:8,8 145:2 151:2 158:4</p>
---	---	--	--

[issuing - layer]

<p>issuing 43:16 75:25 95:2 it'd 68:20 it'll 80:25 81:1 83:9 109:19 item 8:15 24:16 99:21 121:20 144:22 items 148:17 159:6,11 160:17</p>	<p>kept 46:8 key 146:13 kick 151:17 kicked 10:16 kind 12:2 31:15 38:9 45:2,24 62:12,15,19 64:17 66:18 80:16,21 82:19 102:14 109:20 119:21 124:5 126:13,15 139:15 147:24 147:25 kindly 8:3,4 knew 94:17 95:7 100:7 know 7:24 17:12 19:2,18 22:14 23:16,17 38:16 40:1,17 42:14,18 47:5 48:12,14 55:12 58:4,8 59:4,13 61:18 62:10,14 62:18,25 63:9 63:17 73:12 74:20 77:24 78:6 79:8 83:4 83:10 95:8 96:13 98:24 99:7,23 105:8 106:10,19 108:2,22 109:4 111:7 113:24</p>	<p>114:12,20,21 114:25 115:8 117:6 125:18 126:5,12,15,18 126:19 127:18 128:8,23 129:3 129:16,16,18 130:10,13,14 130:18,19,21 130:23 134:4,6 134:10,14,15 135:22,24 136:2,13,18,20 139:16,19,24 140:8,11 141:13,18 143:4,18,21,23 143:25 144:1 147:8,24 148:8 148:20 149:17 150:14 151:20 153:3,13,21 154:9 155:11 155:14 156:3 157:6,18,21 159:21 knowing 40:23 75:4 knowledge 23:9 113:3 126:5 130:4 161:10 162:6 known 19:14 39:16 121:24</p>	<p>knows 39:18 75:9</p>
<p>j</p>			<p>I</p>
<p>james 1:21 161:2,20 jesse 2:6 job 1:22 30:1,1 30:12 72:25 73:1 jobs 72:12,12 73:12 join 160:19 joined 160:4 judge 92:25 jump 112:25 jumped 127:13 jurisdictions 136:2</p>			<p>label 5:13 8:24 lack 18:20 79:15 laid 78:15 81:8 83:5 lake 44:2 48:3 lamar 67:15,17 67:21,25 68:5 69:15 110:6,18 land 29:23 66:11 language 83:25 115:14 lapse 147:13 large 34:8 74:13 79:23 82:22 152:21 largely 47:9 larger 53:15 54:4 lasands 44:7 lastly 153:15 lately 128:1 lawyer 103:22 lawyers 104:8 lay 82:18 101:7 layer 49:14 50:22 67:15,16 68:8 69:3,7,16 97:4 111:12 135:2</p>
<p>k</p>			
<p>k 2:6 keep 33:5 34:12 54:19 77:22 80:8 100:25 keeping 63:8</p>			

[layers - looking]

<p>layers 63:9 110:19 135:1 lays 60:1 leads 96:14 leakage 138:9 learn 126:20 learned 42:11 48:15,16 118:24 learnings 92:12 lease 29:25 leave 55:11 64:2 116:9 147:4 leaving 130:14 left 6:20 16:25 17:20 23:4 136:5 legally 103:4 legislative 147:9 legislature 118:5 length 126:14 lengths 129:17 lessons 48:15 48:17 letters 4:7 level 13:24 18:11 35:4 48:10 54:5 59:21 62:9 63:6 93:7 102:23 104:25 105:23 122:24</p>	<p>125:20 154:19 life 66:15 82:14 lifespan 93:10 light 18:8 75:5 129:14 lightly 35:23 likely 73:13 limestone 67:12,21 68:5 69:15 limit 66:24 71:25 83:7 84:1 90:5 140:25 limitation 83:6 90:2 105:21 limitations 71:13 100:24 117:18 118:3 118:15 limited 59:13 109:10 limiting 15:19 limits 103:7 156:1 line 18:8 64:23 100:21 160:7,7 lineaments 34:1 99:3,11 lines 17:9 18:9 link 128:8 list 2:2 5:8 58:11 60:25 154:15</p>	<p>listed 57:16 listen 40:1 listening 40:5 116:20 literally 31:25 litigation 159:7 little 11:25 40:11 54:22 62:13 64:4,11 87:17 96:10 100:16 105:7 107:23 110:7 110:12 113:1 113:22,25 114:19 136:18 138:13 139:7 149:8 155:24 live 57:4 loads 153:24,25 local 52:9 88:18 located 14:10 15:12 66:11 location 37:22 42:24 44:20 46:3,11 61:7 63:12,25 71:5 71:6 76:23 105:10 118:25 locations 34:20 39:22 64:5 88:21,25 94:21 113:4 locked 66:12</p>	<p>log 74:9,12 97:3 logs 71:14,20 109:8 long 37:9 57:4 62:6 91:6 93:10 97:17 101:18 114:2 114:17 139:3 139:11 151:5 longer 79:24 101:10 138:13 longevity 102:13 look 14:20 57:20 66:3 82:14 88:20 93:12 100:10 105:1,25 106:14 108:3 108:20 115:15 118:17 119:1 140:18 151:21 looked 22:11 22:15 99:8 158:5 looking 8:20 18:18 19:10,15 20:3 21:3 24:8 25:17 33:19 43:16 50:4 51:15 52:14 62:6 64:8 79:22 93:7 94:15 97:10</p>
--	---	--	--

[looking - measures]

98:11 108:5 109:19 113:17 114:23 118:13 118:22 128:22 152:11,17 153:3 156:13 looks 113:23 115:19 116:5 loss 52:16 126:15 134:6,8 136:5 losses 134:5 lost 75:22 108:24 lot 18:25 32:3,3 33:2 47:5 57:17 71:16,16 83:25 91:12 100:18 101:12 107:25 117:8 117:24 119:5 149:3 150:8 153:10 154:1 lots 74:5 louisiana 153:24 low 17:8 49:16 64:16 75:6 lower 33:7 68:22,25 69:6 69:7 96:16,23 110:6 lowest 128:8 142:8	m ma 109:22 made 8:5 98:19 107:16 121:23 124:18 143:13 147:24 158:4 magnify 37:9 mailed 8:3 main 130:21 maintain 73:6 77:22 majority 29:1 39:4 63:16,19 make 16:19 25:1 35:23 56:10 57:3 60:2,16 65:2 71:19 82:13 107:5,11 110:4 122:3 127:14 138:22 140:20 140:21 141:4 149:10 158:10 maker 27:17 makes 126:17 134:6 making 58:19 85:7 88:1,8 114:9 134:21 manage 37:18 40:21 53:11 81:11 146:12 management 29:24 42:22 46:24 57:2	65:22 78:14 85:11 157:8 manager 2:12 28:22,23,25 29:11 40:19 48:13 managers 29:7 manages 138:12 managing 76:20 89:18 151:20 156:3 mandated 53:4 mandatory 83:25 map 16:2,25 17:5,9,14,19,20 17:25 18:1,2,7 18:8 25:21 36:5 37:16 96:8 98:3 109:7 mapped 33:21 mapping 30:6 33:1 margin 50:4 marked 8:24 12:7,8 13:3 30:14 31:18 35:12 43:12 49:3 52:20 55:8 60:22 121:6 123:8 market 89:16	mass 39:6 material 21:11 materials 91:10 114:15 matter 7:11 52:13 84:19 86:14,17 112:22 matters 6:24 max 130:4 135:4 maximum 49:21 53:3 81:19 106:3 121:25 124:12 125:16 126:8 126:16,24 127:8 142:9 143:10 155:12 155:17 mean 50:11 54:7 63:16 82:3 85:4 90:25 92:19 97:10 113:11 115:16 116:1 117:15 118:21 127:25 140:15 meaning 97:21 139:21 means 41:4 66:14 92:5,21 meant 23:13 measures 129:21
--	---	---	---

[mechanism - mountain]

<p>mechanism 85:2 108:12</p> <p>mechanisms 54:4,6</p> <p>meet 68:21 94:23 95:6 132:10</p> <p>meeting 87:7 118:23 158:9 158:16,19 160:18,23</p> <p>meets 133:5</p> <p>member 102:8</p> <p>members 147:6</p> <p>mention 107:16 110:4 158:4</p> <p>mentioned 23:19 34:6 91:8,11 92:7 93:8 97:1 122:19 134:3 141:24</p> <p>mentioning 87:22</p> <p>merrifield 2:13 137:11,15,21 137:25 138:5 138:24 139:6 139:13,23 140:2</p> <p>mesquite 37:13 44:8,24 45:5 46:9</p> <p>message 153:2</p>	<p>met 59:23 78:24 91:11</p> <p>metering 89:25</p> <p>methane 119:3</p> <p>methodology 34:14 132:16</p> <p>mewbourne 96:25 97:12 107:5 144:19 145:3 151:4</p> <p>mexico 1:1 13:23 30:8 53:18 103:5 118:6 145:14 145:20 146:9 154:3 161:21</p> <p>mic 137:18,19</p> <p>micro 47:22</p> <p>middle 37:8 65:19</p> <p>midstream 89:14</p> <p>migrating 130:19</p> <p>mile 22:16 27:8 41:21 42:6,8 42:12,16 43:5 65:16 99:17 112:13,17,20 112:24 113:8</p> <p>miles 66:1,6</p> <p>milestone 26:11</p> <p>milestones 27:12</p>	<p>million 2:14 3:12 119:13 120:7,20</p> <p>mind 64:25</p> <p>mines 30:6</p> <p>mini 126:21,23 135:9,10 136:21,24 137:15,25 138:19 139:20 139:21 140:7,8 140:12 141:12</p> <p>minimal 90:21</p> <p>minimum 74:14</p> <p>ministerial 7:6</p> <p>minute 74:19 86:2,5</p> <p>misconception 98:1</p> <p>mister 116:18</p> <p>mobility 134:12</p> <p>mode 142:4</p> <p>model 57:24 65:7 67:6 143:16,17,18 143:24 152:12</p> <p>modelers 108:11</p> <p>modeling 109:17 110:2 130:17 143:22 155:19,24</p>	<p>models 99:20</p> <p>moderate 17:8</p> <p>moderated 1:8</p> <p>modification 84:7</p> <p>modifications 77:25 150:4</p> <p>modified 69:8 150:20</p> <p>modify 56:9 77:15 81:2 150:16</p> <p>moment 10:17 86:11 127:11</p> <p>momentarily 86:11 122:20</p> <p>money 71:21</p> <p>monitoring 20:12,19 24:3 47:1 73:17 76:6 84:8 85:13 92:23 99:25 106:17 122:2 131:7 146:17 151:7</p> <p>month 159:19</p> <p>morning 6:2 10:13 28:16 84:10 120:15</p> <p>motion 158:18 159:5,18 160:4</p> <p>mountain 6:19 31:22,24 35:18 36:8,19,24 37:2,14 38:22</p>
---	---	---	---

[mountain - notice]

<p>39:9 41:10 43:18 49:9 52:16 56:3 58:25 62:1 65:12 70:17 76:9,22 77:4 77:13 79:9,16 80:13,24 81:4 94:25 95:7 97:9,11 99:16 102:15 103:19 113:14 117:20 149:1 mouse 37:19 move 12:16,25 15:4 31:14 48:17 55:6 59:15,18 73:16 76:17 82:15 86:17,20 94:2 97:21 101:10 121:4 131:23 147:7,18 158:8 moved 92:24 movement 34:2 143:15,19 moves 92:17 moving 16:20 16:22 17:21 21:19 67:10 68:22 70:11 71:24 80:11 100:4 127:20 158:12</p>	<p>multiple 76:15 118:13,21 myopic 43:17</p> <hr/> <p>n</p> <hr/> <p>n 2:1 3:1 6:1 name 10:14,23 28:17,18,18 120:18,20 nance 4:20 32:1 113:17 national 29:19 natural 112:1 nature 126:2,3 ndt 138:1 near 99:6 necessarily 21:10 27:16 57:7 60:8 61:14,15 106:2 necessary 19:24 20:7,15 24:10,12 34:22 38:17 48:19 54:4 58:15 67:19 78:18 85:3,15 94:23 101:13 123:1 131:16 148:7,9 148:16,24 149:7,22 151:14 necessity 78:13 79:19 113:15 114:9</p>	<p>need 18:25 23:22 26:22 48:22,24 52:7 58:20,24 60:4 60:12 61:25 74:20 75:1,23 76:5 80:18,22 81:16 83:13 86:14 87:10,14 91:9 94:14 95:6 96:10 106:7 110:3 130:11 145:13 148:2 151:21 152:1,10 158:15 needed 74:16 76:18 95:8 101:10 150:19 needs 56:2 87:19 118:11 127:18 149:4 156:22 negotiate 112:4 115:21 negotiating 85:5 neither 113:2 161:11 162:7 network 10:16 never 23:13 93:21 98:6 99:19 156:2 new 1:1 13:23 30:8 43:22,23</p>	<p>44:5 53:18 70:13 97:13 98:2,6 99:20 99:20 103:5 118:6 124:12 145:13,20 146:9 149:14 154:3 161:21 newly 71:12 nice 132:10 nine 72:4 83:2 nm 1:16 nmoga 16:1,25 17:25 18:5,7,8 18:14,16 23:3 36:1 96:4,7 97:2 98:3 nmoga's 49:7 non 45:15 nonacid 65:17 normally 105:25 108:15 135:23 137:15 137:25 north 99:15 northeast 44:2 notably 155:22 notary 161:20 notation 46:4 note 55:23 noted 18:14 49:18 76:11 88:3 159:8 notice 6:6 7:23 8:2 43:25</p>
---	---	--	---

[noticed - ocd's]

<p>noticed 6:6 notices 4:10 7:22 8:8 notification 20:20,25 21:13 26:25 27:3,8 27:15 59:23 68:19 notifications 30:3 noting 46:5 121:2 159:10 notion 146:13 november 1:9 6:4 number 6:13 6:14 12:17 13:2,20 14:5,7 15:5,7,8,18 16:22,24 17:21 22:25 25:12 30:11 31:4,17 35:9 49:2,5,6 51:7 52:19,24 55:7 60:21 106:16,16 121:4,20 123:6 128:15 134:6 136:22 145:1 155:14 158:4 numbers 6:17 155:8</p>	<p style="text-align: center;">o</p> <p>o 6:1 28:19 objection 7:16 8:9,10 9:3,4 12:18,19 31:7 70:15 86:21 131:25 140:24 objections 9:13 119:15 121:9 obligation 41:5 152:13 obligations 29:3 41:18 58:23 137:8 observation 77:5,13,21 152:19 observations 151:18 154:11 157:1 observe 39:25 observed 40:8 78:19 99:17 observing 40:15 obtain 75:18 obtained 50:4 obviously 150:15 158:12 159:7 occ 63:14 157:10 occur 21:1 35:2 124:2</p>	<p>occurrence 21:13 125:10 126:4 occurs 151:7 ocd 4:13 5:3,8 6:20 9:6 11:25 12:7,8,17,21 13:2,3 14:1 18:18,21 19:5 19:10,21 20:14 21:1,3,6,17 23:19 24:8 26:13,25 27:2 27:15 30:11,14 31:4,11,17,18 32:20 35:8,12 36:13 38:18 41:12 43:3,12 49:1,3,5,6 52:18,20 55:7 55:8 57:7,12 60:10,21,22,25 61:10,20 63:1 63:11,14,16 65:25 66:24 67:20 68:3,24 71:24 73:11 78:2,17 79:5 80:11 82:20 83:6 84:23 85:2 86:20,24 90:15 91:25 92:13 96:1,15 97:1,5,12 98:5 98:11 100:21</p>	<p>106:22 113:1,2 113:25 114:22 114:24 115:23 115:24 117:10 118:17 119:12 120:24 121:4,6 121:12 122:19 122:19 123:8 123:13,20 124:3,17,21,25 125:6,11,24 127:2,7 128:3 128:15,22 129:20 131:16 132:3 136:6 139:14 140:18 141:7 142:11 144:19 145:3 145:23 147:25 148:2,7 149:9 153:7 154:21 156:12 157:12 ocd's 5:9 16:11 16:13 18:11,18 20:9 25:24 27:6 34:22 40:20 47:10 52:3 53:17 54:23 56:21 62:15 64:17 90:8 91:12 108:4 123:10 130:3 131:8 141:12 148:7 148:24 149:14</p>
---	---	---	---

[ocd's - oppose]

<p>149:17 151:9 154:12 155:4 156:7 157:12 ochi 2:15 offered 81:17 152:19 offering 119:19 154:11 offers 71:5 offhand 23:18 office 105:3 officer 161:1,2 official 27:10 officially 7:4 offsetting 129:7 oh 8:5 83:20 116:1 117:2,14 137:1 155:14 159:16,20 oil 1:2 6:3,4,21 7:24 9:21 11:11,14 28:21 29:5,24 30:3 30:20 79:5 84:25 85:1,13 89:7 120:21 159:11 okay 10:25 11:7,10 17:21 19:18 22:21 23:12,19 26:15 27:19 30:17,19 34:5 38:5,16 42:5 44:14 45:2 47:14</p>	<p>48:10 52:18 53:21 56:18 58:4 61:4 63:10 64:4 68:3 73:23 74:4 81:23 82:2 99:1,9 105:6 107:2 111:2,13 115:9 115:23 116:15 119:7 122:6 123:23 124:14 124:20,24 125:5 126:8 128:13 130:24 131:3 133:9,17 135:22 136:15 136:17 138:4 140:13 141:14 144:7 157:15 160:2,5,10 oklahoma 153:25 old 33:1 34:14 48:19 50:5 63:22 70:17,18 70:19,22 71:10 71:11 130:24 older 43:24 once 40:24 59:21 107:17 110:24 122:2 129:13,15 130:23</p>	<p>ongoing 56:7 96:9 117:23 151:21 152:6 online 10:16 86:11 open 24:23,25 41:15 46:10,22 47:6 138:1 opening 97:1 operated 89:6 operating 58:18 152:25 operation 45:9 71:7 75:8 94:1 94:3 109:23 operational 77:2 operations 29:25 39:12 45:8 108:2 115:25 operator 21:5 21:10 34:16 44:5 45:5,15 48:23 58:15,22 65:2 69:24 70:2 71:5 75:8 78:25 85:5,7 88:7 89:23,25 99:18 100:5 134:24 operators 35:17 39:12 44:6 47:6 50:25 52:13</p>	<p>55:24 57:17 65:11 66:13 74:7,14,24 77:4,20 79:24 81:7 87:24 89:12,20 94:13 95:11 107:4 117:24 118:19 125:25 141:24 145:21 opine 157:1 opined 61:18 opinion 20:24 34:21 48:13 61:18 79:7 88:17 89:9 91:23,24 99:9 105:9 122:25 131:15 135:10 opinions 102:21 opportunities 90:4 101:6 opportunity 39:11 40:12 46:11 53:23 59:15,18 60:2 66:15,21 75:6 76:1,7 77:12 77:14,20 85:24 88:5 92:4 105:22 115:12 115:14 147:23 oppose 18:19 151:4</p>
--	--	--	---

[opposed - parties]

<p>opposed 19:23 151:6 opposes 113:2 opposing 24:9 opposition 60:18 opted 140:12 optimization 134:20 option 39:21 optionality's 151:22 options 94:15 145:13,19 158:16 order 6:4 10:10 29:22 42:17 44:22 46:16 82:23 85:8 86:20 101:18 101:19 103:14 104:11,13 114:12,23 115:7,18 121:25 122:3 141:10 146:25 147:1 150:19 155:4 156:6,8 157:10,13 158:2,6,10,20 orders 4:24 29:15 44:11 oriented 48:1,2 original 6:6 49:23 97:24</p>	<p>103:14 originally 7:24 58:12 96:9 outcome 161:16 162:12 outer 18:16 129:19 outline 38:13 outlined 16:8 19:3 36:16 outlines 36:22 outlining 38:9 outside 11:23 18:3,12,17 19:14 39:2 65:17 71:25 108:7 111:11 overall 77:23 79:14 overarching 16:12,13 overarchingly 61:20 overlain 76:15 overlap 66:25 overlay 17:24 18:7 overlays 18:9 overriding 147:25 oversee 11:18 29:1 overseeing 11:13,17 29:7 29:24</p>	<p>overseen 12:1,3 oversight 29:21 33:19 overview 4:18 13:21,24 14:9 own 35:5 50:14 50:24 59:11 79:25 83:11 84:16 owned 45:7 oxy 37:13 44:8 45:7 46:6 54:16</p> <hr/> <p style="text-align: center;">p</p> <hr/> <p>p 2:1,1 6:1 p.m. 160:24 pa 109:23 package 156:6 packer 97:22 packet 7:21 page 4:2,12 5:2 8:24 14:4 22:8 22:9,23 32:24 44:17 98:19 99:5 128:17,18 155:14 pages 98:12,18 panacea 151:25 papa 99:6 139:9 155:19 paper 32:15,20 34:22 52:2 55:11,13,15 113:17</p>	<p>papers 14:3 118:15 paperwork 46:15 paragraph 67:10 70:11 71:24 73:16 75:12 96:2,15 160:8 part 13:23 15:22 29:13 36:13 58:17 68:8 78:12 92:23 participate 122:21 participated 36:1 participating 79:4 particular 25:15 26:6 36:7 50:9 58:5 63:2 132:17 149:13 particularly 93:2 parties 6:23 32:16 119:22 144:18 147:1,6 150:18 155:3 156:5 157:9 158:1,9 161:12 161:14 162:8 162:11</p>
--	--	---	--

[parting - pilot]

<p>parting 49:17 50:2 84:3 135:3 party 109:5,11 past 30:20 100:23 126:4 129:6 141:24 157:11 path 92:9 130:23 143:25 pathway 60:2 pathways 34:2 40:3 pattern 59:21 148:25 patterns 60:10 60:12 pay 50:9 paying 69:5 pecos 1:13 160:19 pending 159:7 159:11 pennsylvania 70:21 people 54:10 72:15 73:5 82:18 111:10 141:5 percent 111:6 126:12,12 133:25 134:1,9 134:10,16,16 135:23 136:3,3 136:4,13</p>	<p>138:17,20 151:19 perforation 139:4 perform 97:13 135:1,2 140:8 performed 29:21 149:5 performing 43:21 period 33:15 39:10 44:18 permanent 33:6 83:24 permeability 134:11 136:8 permeable 110:18 permeated 52:3 permian 117:16 permission 9:23 permit 35:21 42:4 46:12 53:25 56:10 57:3 58:2 60:19 63:6 67:7,22 68:7 69:8 76:4 80:13 82:5 84:1,9,11,18 90:10 93:13 101:2,14 102:16 104:10</p>	<p>104:14 105:2,4 106:2 110:21 110:25 114:12 115:4 116:8 154:24 155:18 155:23 156:7 permit's 111:10 permits 29:5 34:14 38:19,22 40:21,24 41:10 42:24 43:16 45:18 78:23 79:11 83:21,21 95:2 98:3,6 105:18 113:4 116:9 128:2 151:9 permitted 52:8 109:4 111:8 125:22 154:20 permittee 123:13 permittees 125:25 permitting 11:19 29:2 35:3,5,17 36:14 41:17 42:13 47:24 48:23 59:17 61:16 67:9 74:17 78:18,21 82:7 87:14 92:23 98:10</p>	<p>person 115:1 personally 22:14 26:2 145:1 personnel 29:8 perspective 18:12 19:21 20:8,9 59:4 135:13 pertinent 127:16 petroleum 2:14 31:1,5 120:23 121:3 pfas 147:10 ph 39:16 44:7 phase 76:8 phil 2:12 28:2 phillip 3:7 28:8 28:18 picked 88:13 picks 97:4 picture 44:18 57:23 76:24 125:13 134:15 pieces 153:13 153:20 154:4 154:10 156:14 pilot 19:20,22 20:10 58:14 59:2,7 60:1 78:4,10 88:3,4 88:14,18 89:8 92:7,13 100:20 100:22,24</p>
--	--	---	--

[pilot - preferred]

<p>104:5,21 117:19 146:13 146:14 152:17 place 32:9 43:20 53:20 75:13 94:22 96:12 100:25 102:24 placement 47:20 places 126:21 placing 24:8 105:21 plan 27:9,11 133:1,5 planning 14:25 134:24 plans 62:16 97:7 149:19 plant 66:16 play 33:11 81:15,15 plays 134:11 pleadings 159:19 160:4 please 10:2,13 11:6,21 13:7 13:18 14:7 15:5 16:23 17:22 22:24 28:4,16,24 29:9 31:20 37:21 43:10 52:22 70:12 72:10 76:5,25</p>	<p>120:4,11,18 121:17 131:23 133:24 134:24 137:9,18,20 plot 117:5,8 127:22 128:19 128:22 129:12 129:24 130:7 130:10,12 131:9 143:24 plots 45:11 54:23 128:3 148:4 plug 46:13,17 129:17 plugged 43:22 44:21 46:12 70:25 plugging 45:18 plugs 70:22 plume 59:24 plumes 67:5 plus 115:6 point 14:6,18 21:13 26:9 31:16 34:24 38:20 39:20 52:13,17 53:14 58:11 61:14 67:20 70:4 72:6,25 81:16 83:10 84:2 86:20 96:5 101:3,9 102:23 104:19 105:17</p>	<p>118:4 119:2 127:23 135:7 136:23 140:21 pointed 51:23 points 142:7 poker 44:2 48:3 policy 92:19 politics 117:13 pools 14:14 poor 30:12 61:13 83:22 popular 70:23 porosity 146:16 portion 13:1 152:24 position 11:11 11:12 16:9 23:21 26:24 27:6,15 28:21 67:13 89:11 92:4 116:11 120:21 126:24 131:10 143:21 position's 107:3 possibility 115:5 possible 21:12 25:2 potential 17:3 17:25 18:4,9 18:13,17 20:20 20:25 21:4,7 26:23 27:1 40:2,22 80:23</p>	<p>89:1 99:24 131:11 144:22 148:15 potentially 99:25 148:14 151:3 potentials 17:7 17:8,10 powell 2:11 3:3 9:22 10:5,24 11:3,5,8,10 12:25 13:9,18 14:4 15:4 16:22 17:22 20:18 25:16 26:4,14,20 27:7,18,21 powell's 4:14 27:23 practical 85:9 113:19 115:11 practicality 64:7 practice 72:22 73:3 92:20 practices 4:19 13:25 15:9,10 16:8 48:19 prc 108:16 pre 15:11 25:23 113:1 132:19 prefer 139:25 preferred 34:11 35:24 39:19</p>
---	--	---	---

[premise - process]

<p>premise 61:4 preparation 138:14 158:19 preparations 97:15 prepare 13:5 157:10 prepared 12:14 22:5 30:17 162:3 preparing 87:6 presence 99:10 present 6:8,12 35:3 101:22 142:24 presentation 5:4,10,12 19:5 27:22 31:21 40:2,6 49:6 65:25 85:7 126:20 151:13 157:14,21,23 158:20 presentations 102:1 presented 84:5 96:9 105:8 110:5 114:16 140:17 presenting 102:18 107:24 149:15 pressing 25:25 pressure 49:15 49:21 50:2,3</p>	<p>50:12,15,19,20 51:3 52:3 53:3 53:11,18 54:10 72:25 73:9 75:3,5,6,18 76:2 77:6 81:20 82:4 83:6,7 84:3 90:2,5,6 105:14,18 106:3 122:1 124:5,6,9,9,13 125:14,17,23 126:7,9,17,25 127:9 128:9 130:4 134:5,18 135:3 142:1,9 143:11 pressures 75:21 106:4 pressurized 72:21 pretty 63:15 72:6 prevent 122:18 131:16 152:13 157:5 preventing 35:6 prevention 41:1,8 95:12 122:17 123:2 prevents 145:25</p>	<p>previous 59:6 80:19 106:13 previously 6:5 18:4 30:24 51:19 61:18 63:13 119:20 125:20 137:12 primacy 16:7 49:19,23 65:18 90:11 94:19 112:6 primarily 14:23 77:10 primary 16:18 61:9 80:17 prior 9:2 29:16 29:22 30:1,7 34:18 44:7 48:24 84:2 86:18 124:22 125:1,8,12 126:5 130:3 131:11 132:20 132:20 150:9 161:5 priority 33:16 private 44:5 probably 29:12 63:11 74:12 77:17,19 82:6 82:19 96:5 99:7 108:7,20 128:10 137:2 142:3 160:13</p>	<p>problem 60:5 102:25 103:3 106:23 107:6 110:7 118:23 154:4 problematic 29:2 100:1 problems 35:5 50:12 60:8 70:16,19 77:11 92:5 107:1 117:16 119:2 procedure 58:18 procedures 106:18 proceed 40:23 61:16 proceeding 162:4 proceedings 161:3,5,6,9 162:6 process 21:8,18 26:2 27:13 35:5 46:25 47:24 48:23 50:24 56:7 59:17 60:4 61:16 70:8,10 78:12,21,22 79:3 82:7 83:14 87:14 88:8,20,24 91:20 92:2,24</p>
--	--	---	--

[process - provided]

<p>96:14 100:5 102:6 104:25 113:23 147:7 processes 57:2 processing 34:14 39:22 66:6,11,13,20 produced 14:12,23 117:6 118:12 151:20 153:19 producer 48:5 99:3 producers 89:18 146:12 producing 15:1 89:7 product 129:23 production 4:18 13:22,24 14:10,15 15:21 15:21 17:4,7 18:1,13 19:13 20:5 22:10,12 22:15 25:18 48:2 50:6 57:18 62:24 66:12 71:11 75:22 89:24 96:23 134:21 productive 14:14 25:20 professional 48:12 122:25</p>	<p>program 112:11 progress 33:14 progressed 44:4 progressions 47:12 prohibition 23:13 61:14 project 19:19 20:11 36:23 58:14 59:3,8 60:1 78:4,10 88:4,4,14,18 89:8 92:8,13 100:21,22,24 104:5,22 117:19 146:13 146:14 152:17 projects 54:9 97:10 107:25 107:25 146:4 prominent 29:18 33:11 90:5 promoted 12:4 propagate 73:14 proper 20:1,1,2 54:13 157:7 properly 19:16 74:1 81:11 proposal 5:9 20:10 22:15 123:10</p>	<p>proposals 131:15 propose 119:20 158:8 proposed 18:3 18:12,14 20:19 22:12 61:8 65:7 72:3,4 83:4 131:8 147:1 150:19 151:9 152:23 proposes 25:14 27:5 proposing 14:22 24:6 61:1 65:11 90:3,7 proposition 45:13 protect 82:23 122:18 131:17 152:13 157:5 protectable 17:1 23:4,7,10 protected 16:15,19 63:4 78:19 126:19 protecting 59:22 122:18 125:18 130:25 157:6 protection 16:18 18:14 41:2,7 42:17 61:8 63:7</p>	<p>77:11 95:13 122:16 123:2 151:7 protective 48:21 146:1 protects 145:24 protest 60:7 protested 112:21 protests 37:4 protocols 24:2 prove 49:25 106:20 provide 11:21 29:9 31:22 32:10 34:16 42:17,22 53:23 53:24 57:12,13 57:23 58:10 62:8 69:3 70:2 76:18 87:24,25 89:15 90:23 91:16 93:6 98:8 115:16,22 121:17 142:19 153:12 156:23 158:10 provided 16:1 21:2 41:14 43:1,14 45:10 51:5 58:7 113:5 115:4 123:19 130:17 149:20 150:1 150:16</p>
---	---	--	--

[provides - rate]

<p>provides 32:5 providing 92:14,15 102:19 146:18 153:6 154:15 provision 64:3 proximity 67:4 prudent 42:7 42:10 psi 49:20 51:12 52:4 53:2,19 54:5 75:3 90:8 90:12 126:1 127:2 130:5 public 67:24 76:6,19 151:15 161:20 publication 8:4 pull 26:22 40:25 155:8 pulled 14:1 pulse 129:1 purely 45:5 purpose 46:7 66:6 67:12 70:12 72:11 73:23 74:20 119:20 130:2,7 139:14 purposes 17:12 44:23 127:19 pursue 153:3 purview 97:16 push 74:12 94:18 118:7</p>	<p>149:7 pushback 47:5 pushed 72:21 put 15:22 17:6 35:23 53:25 59:16 74:7 76:4,12 80:21 82:20 100:23 103:6 104:15 115:7,20,21 116:8 118:5 126:23 128:3 145:6,22 149:9 152:4 155:3 156:5 putting 64:8,19 77:6 93:25 108:9 155:15</p>	<p>quantify 88:8 question 20:18 40:11 42:25 59:9 79:6 81:19,20 82:5 83:15 131:14 133:9 134:23 135:5,20 139:2 141:15 143:12 146:22 156:4 questionable 73:10 questioning 132:13 questions 21:21 21:23 22:7 24:21 25:3,7 25:10 26:16,18 27:19 33:23 39:24 73:25 74:2 77:24 83:16 87:9 95:15,18,24 100:12,19 116:16,21,24 121:21 124:15 127:14 131:19 132:12,14 133:15,22 135:16 140:24 141:2,6 142:21 144:9,11 145:4 145:10 152:8 153:16 154:17 156:18</p>	<p>quick 6:7 132:12 159:16 quite 42:13 43:21 102:11 111:21 117:25 148:5 158:4 160:20 quorum 6:12 86:13</p>
	q		r
	<p>qualification 41:16 qualifications 7:9 119:19 qualified 69:8 119:20 161:7 qualify 35:16 79:20 81:2 88:8 qualifying 48:19 quality 29:6 50:12 72:24 quantification 57:3 59:16</p>		<p>r 2:1 6:1 ra 96:4 radial 54:19 56:24 radius 22:16 41:22 112:3,13 112:20 rail 5:5 53:1 153:23 raise 10:2 28:4 69:4 81:25 120:4 raised 28:6 ran 111:5 range 51:4 rare 47:21 63:17 rate 50:1,5,15 54:6,7 74:21 74:24 75:2 84:24 97:13,20 105:22 121:23 127:16 132:15 134:2 135:1 141:15,25</p>

[rate - reflective]

<p>142:1,1 155:12 155:17,17 rays 76:15 rcx 3:2 rdt 138:1 rdx 3:2 reach 48:8 reached 156:2 reaching 75:3 reacting 152:4 read 68:4 140:6 ready 25:24 real 69:12 84:17 93:13 154:1 159:16 realistic 82:10 82:19 realistically 110:16 reality 83:3 realize 47:20 79:20 94:18 really 20:2,7 62:14 71:18,21 72:11,23 103:1 108:1 109:4 117:7,10 138:14 145:5 146:20 147:25 152:9 157:21 157:23 realm 70:4 103:16 reappearance 101:22</p>	<p>reason 22:18 46:21 47:8 48:2 55:17 84:17 125:9 127:23 138:15 138:25 reasoning 77:1 reasons 61:9 88:13 110:17 112:14 113:12 150:13 reassess 127:8 recall 20:21 41:19 81:18,20 88:12 receive 27:15 155:6 received 7:14 8:12 9:7 12:21 31:11 43:25 45:20 86:25 121:12 132:3 receives 67:14 recently 109:2 154:1 recognition 49:15 65:13 148:1 recognize 35:9 recognized 13:9 31:10 recognizes 148:3 recommend 84:6 125:6</p>	<p>recommendat... 43:3 47:10 54:24 85:2 101:11 142:6 recommendat... 19:5 74:23 96:25 122:22 149:8 recommended 73:19 97:12 recommending 18:22 124:21 124:25 147:16 recommends 85:12 128:3 reconsideration 84:9 record 6:11,25 7:11,13 9:2,11 10:14 28:17 35:21 57:21 59:12,16 68:3 69:14 73:24 86:7 92:8 98:5 120:19 140:22 141:1 149:10 152:4,19 153:22 159:4 161:9 162:5 recorded 161:6 recording 101:13 161:8 162:4 records 71:14 74:2</p>	<p>recovered 15:24 recovery 91:3 red 17:9 36:16 38:12 redirect 116:25 144:12 reduce 16:3 reduced 161:7 redundant 103:12 reenter 70:25 reentered 46:12 reentries 43:24 reentry 63:22 reexamination 97:2 refer 44:16 128:15 reference 4:20 31:25 32:14 33:22 96:19 143:13 referenced 43:9 45:1 48:11 54:3,23 125:20 referencing 44:12 referred 33:17 142:12 reflect 6:11 114:16 159:4 reflective 94:25</p>
--	--	--	--

[reflects - requiring]

<p>reflects 145:23 156:17</p> <p>refresher 91:14</p> <p>regard 121:22 121:23 151:8</p> <p>regarding 19:7 31:21 34:1 40:2 41:20 49:8 57:18 79:15,15 96:1 96:15 98:11 99:9 149:1</p> <p>regards 37:13 55:20 75:25 85:10 99:13 100:20 102:12 107:4</p> <p>regional 51:17 135:8</p> <p>register 134:22</p> <p>regulatory 21:6 75:9</p> <p>reissued 39:13</p> <p>reiterate 38:12</p> <p>rejected 63:24</p> <p>relate 105:10 128:23</p> <p>related 4:24 17:3 20:20 37:1 39:25 44:11 67:21 68:25 76:22 82:4 148:5 161:11 162:7</p>	<p>relates 11:24 13:22 14:20 15:9</p> <p>relationship 34:9,18 82:3 89:22 99:24 109:20</p> <p>relationships 55:22 67:6</p> <p>relative 161:13 162:10</p> <p>release 101:3</p> <p>releasing 86:18</p> <p>relevant 70:1</p> <p>reliability 138:7 140:3</p> <p>reliable 87:13 135:11</p> <p>relied 109:16</p> <p>rely 34:16</p> <p>remain 40:20 40:20</p> <p>remained 45:9 45:20</p> <p>remains 159:10 160:8</p> <p>remarks 144:18 152:3,3</p> <p>remember 116:6 136:20</p> <p>remembering 112:10</p> <p>removal 29:20</p> <p>remove 78:13</p>	<p>rental 45:6</p> <p>replace 9:2 91:1</p> <p>reply 160:1</p> <p>report 84:14 85:3 101:8 115:25</p> <p>reported 1:21</p> <p>reporter 10:1,2 10:19,21 11:4 28:4,12 120:3 120:4 137:17 137:22,24</p> <p>reporting 29:3 64:9 84:8,12 84:22,24,24,25 85:13 101:1 131:7</p> <p>reports 36:17 36:25</p> <p>represent 29:15 33:3 114:8 148:14</p> <p>representation 35:14</p> <p>representative 32:6 33:20 50:20,22</p> <p>represented 34:5,6</p> <p>represents 33:8 33:10 36:17 46:24 84:20 95:4</p>	<p>request 9:9 38:25 46:16 49:14 50:10 56:5 60:15 62:15 74:9 75:1 148:8</p> <p>requested 8:25 76:12</p> <p>require 61:21 84:12,21 113:4 123:13 124:7 129:11 149:13</p> <p>required 18:23 61:23 74:5 78:22 79:10 96:3 109:15 124:16 125:1</p> <p>requirement 73:21 74:11 75:14,18 84:24 92:22 97:13 102:9 125:2 130:3 131:8</p> <p>requirements 47:25 48:18 55:4 62:20 68:21 90:8 101:3 103:8 114:11 133:6 149:14</p> <p>requires 68:19 124:3</p> <p>requiring 125:7</p>
--	---	---	---

[research - rock]

<p>research 23:18 reserve 27:20 reservoir 42:19 65:4 66:16 72:24 73:8 74:25 99:14 105:25 126:3 126:14 130:22 130:25 138:3,9 143:5 reservoir's 129:9 reservoirs 156:4 resolution 27:3 29:25 96:7 resolve 92:5 resource 41:8 42:23 77:11 131:11 resources 41:7 42:18 48:22 93:12,15 96:14 103:2 respect 132:19 respectful 149:7 respond 141:13 response 53:5 53:14 70:5 123:18 142:19 159:18 responsibilities 29:14</p>	<p>restricted 118:1,2 restriction 16:2 restrictions 58:3 result 15:25 50:17 115:22 119:1 124:8 126:22,23 resulted 36:5 45:17 50:16 52:12 resulting 36:13 results 45:3,4 91:3 93:15 101:22 102:20 102:21 104:16 134:2 resume 4:16 10:17 11:5 30:13 86:5 resumes 4:9 7:8 7:13 resuming 6:13 6:16 return 86:10,13 returned 109:2 review 18:11 22:19 32:17 41:4 42:3,7,8 42:12 43:5 51:23 52:3 58:4 62:21 65:15 66:2 69:20 71:17</p>	<p>78:23 96:8 111:25 112:9 122:10,13,15 147:2 148:21 158:3 reviewed 16:10 114:14 122:6 reviewing 14:19 32:20 34:22 38:18 122:11 146:17 reviews 21:15 revised 5:11,13 8:16,17,18,24 revision 8:21 141:7 revisit 111:1,9 revocation 45:17 revoked 45:22 reworked 83:21 right 8:20 10:2 10:9,18,18 12:12,23 17:5 17:19 18:6 23:4 28:1,4 32:14 34:15 42:2 43:8 55:6 62:12 64:23 65:16 68:22 69:19 70:11 73:16 75:11 80:15 86:3,4 88:10 90:9</p>	<p>91:6 92:11 114:10 115:1 120:4 121:15 121:25 123:6 125:16 126:16 126:18,24 130:17,24 134:5,11 136:3 139:3,5,12,16 140:10,11 141:25 142:4 143:5,8,10 149:11 righthand 14:21 rights 16:3,15 16:16,17 20:17 41:2 56:12 57:5 59:22 63:8 79:17 82:23 83:1 95:13 118:2 122:5,17 123:2 125:11,18 126:5 130:1 131:17 145:25 151:8 152:11 152:13 157:5 risk 70:9 road 51:9 64:10 74:1 154:13 robust 91:9 rock 113:16 134:18</p>
--	---	---	--

[role - seismicity]

<p>role 11:16,17 11:23 29:11 46:6 89:17 90:5 134:11,20</p> <p>roll 6:7</p> <p>room 1:13 42:14 82:22 96:11 109:19</p> <p>rough 17:24</p> <p>round 84:10</p> <p>rta 143:13</p> <p>rubin 2:10</p> <p>rule 110:23 149:19</p> <p>rulemaking 30:22 147:10</p> <p>rules 68:18 77:15 83:23 98:6 106:3 110:14 112:10 117:17 154:13</p> <p>run 6:6 73:18 97:24 103:3 138:1,17</p>	<p>134:10 135:20 135:23,25</p> <p>saint 1:15</p> <p>salient 45:24</p> <p>salt 6:18 19:23 59:5 67:3 79:10 153:8,8</p> <p>sample 127:21</p> <p>san 83:11 94:19</p> <p>sanction 102:5</p> <p>santa 1:16</p> <p>satisfied 41:9 109:10</p> <p>satisfy 56:10</p> <p>save 102:23</p> <p>saw 109:2</p> <p>saying 44:10 46:22 67:25 76:4 100:10 103:22 104:14 105:14 109:9 109:19 136:20 139:24</p> <p>says 110:23</p> <p>scale 80:22,23</p> <p>scanlon 118:16</p> <p>scenario 43:15</p> <p>scenarios 75:25</p> <p>schedule 147:9 160:12</p> <p>scheduled 158:9</p> <p>scissors 108:8</p> <p>scope 80:21</p>	<p>screen 9:24 12:11 14:5 31:17 37:23 56:13 123:6</p> <p>se 23:13</p> <p>seat 120:11</p> <p>seated 10:10</p> <p>second 10:17 61:19 86:9 103:15 128:17 136:23 142:2 155:9 158:18 158:23</p> <p>section 46:2,4,5 46:10 56:17 64:24 81:7</p> <p>sections 54:10 97:4</p> <p>see 14:21 18:24 19:12 20:2 23:20 24:13,16 27:10 32:11 34:17 36:2 47:3 50:8 56:7 57:21 76:2 78:23 80:1,4 82:8 89:22 91:4 99:6 102:1 103:1 106:9,15 109:23,24,25 111:24 114:2,5 115:18 116:13 117:22 120:17 127:22,23</p>	<p>129:7,19 130:23 134:15 135:6 143:14 155:19 157:9 160:21</p> <p>seeing 15:15 35:19 36:25 39:5 50:14,25 53:10 76:14 114:11 128:2</p> <p>seek 77:19 108:12</p> <p>seemed 52:16 67:22</p> <p>seems 40:10 51:18 62:13 89:7 94:11 98:1 146:8 150:11,17</p> <p>seen 51:7 64:21 70:7 91:2 93:18 109:7 130:16 142:1 143:6 157:23 160:9</p> <p>sees 76:18 107:9</p> <p>segue 60:20</p> <p>seismic 53:4,14 70:5,5 76:6,12 108:9 109:14</p> <p>seismicity 5:7 55:16,21 62:5 76:21 119:4 152:6,7</p>
<p>s</p>			
<p>s 2:1 4:1 5:1 6:1</p> <p>sacrificing 16:16 95:9</p> <p>safe 136:13</p> <p>safeguards 148:16</p> <p>safety 50:3 96:21 124:10 125:15 126:9 126:11 134:1</p>			

[seismologist - slides]

<p>seismologist 76:18</p> <p>seismologists 109:15</p> <p>select 71:6</p> <p>selected 37:10 46:10 88:24 112:11 113:4</p> <p>selecting 146:14</p> <p>selection 62:18 67:11 111:23</p> <p>self 8:5 89:6</p> <p>send 117:9</p> <p>sending 117:24</p> <p>sense 32:24 42:22 100:24 108:12</p> <p>sensitive 155:25 158:14</p> <p>separate 123:11 125:21 128:5 142:7,13 142:14,15</p> <p>separately 128:5 142:6 143:10</p> <p>separating 128:4</p> <p>series 31:14</p> <p>serious 151:3</p> <p>serve 29:7</p> <p>served 49:23</p> <p>service 124:12</p>	<p>session 147:10</p> <p>sessions 145:11</p> <p>set 7:7,24 83:6 125:22 148:22 149:14</p> <p>sets 7:3,5 117:17</p> <p>settled 45:16</p> <p>seven 41:21 72:3</p> <p>several 29:18 35:22 38:24 55:24 66:16 70:24</p> <p>severitas 22:12 139:7,8 155:21</p> <p>shale 51:1</p> <p>shallow 118:8</p> <p>shape 37:22</p> <p>share 8:15 29:14 119:5 150:8</p> <p>sharing 9:23 30:12 71:15</p> <p>shedding 129:23</p> <p>sheet 32:17</p> <p>shortcomings 59:14</p> <p>shortly 13:13 155:3</p> <p>show 8:18 17:10,20 65:9 92:21 98:20 111:11 123:10</p>	<p>155:20</p> <p>showed 15:20 25:12,21 47:23 50:11 64:19 117:5 155:12</p> <p>showing 7:22 47:18 51:11 143:14</p> <p>shown 14:15 16:5 17:8,19 25:18 99:5</p> <p>shows 8:2 17:6 18:2 23:3 44:19 146:3</p> <p>side 14:21 21:4 64:22 91:3 109:8</p> <p>signature 161:19 162:17</p> <p>signed 85:8</p> <p>significance 19:22 59:7</p> <p>significant 14:19 15:17,19 42:13 148:2,14</p> <p>significantly 15:14</p> <p>signs 115:5</p> <p>similar 19:13 20:4 43:6 53:10 64:21 68:24,24 69:15 86:16 98:19</p> <p>simply 62:24</p>	<p>single 103:7</p> <p>singular 43:17</p> <p>sir 119:7 120:11</p> <p>sit 28:15 151:23</p> <p>sits 155:16</p> <p>sitting 85:5 87:16 152:24 156:21</p> <p>situated 89:21</p> <p>situation 21:7 45:14 77:17 79:1 87:18 106:9 138:6</p> <p>situations 60:14</p> <p>six 35:14</p> <p>size 97:22 126:13</p> <p>sized 53:10</p> <p>skills 161:10 162:6</p> <p>skipping 45:2 121:15</p> <p>slap 104:11</p> <p>slide 14:6,7,7,8 14:9,16,17 15:4,6,8,18,23 16:8,22,24 17:5,17,21,23 23:3 25:12 39:25 51:10</p> <p>slides 16:6 25:22</p>
--	---	--	--

[slogan - state]

<p>slogan 145:15 slurry 39:16 62:1 small 39:12 157:18 smaller 15:12 15:14 smallest 95:2 snapshot 32:5 44:15 49:11 55:19 92:4 148:23 solicit 108:7 somebody 64:9 soon 104:21 sorry 97:17 123:15 136:24 159:16 sort 23:20 26:25 27:4,5 42:22 57:11 70:5 71:20 73:2 77:18 84:14 87:17 89:18 92:15,22 96:21 101:14 110:18 113:22 145:6 152:3,4 152:14 153:1 153:13 154:4 154:13,17 155:16,21,23 156:2,6,19 sounded 87:16</p>	<p>sounds 20:9 21:9 25:25 26:2 58:5 87:9 117:8 132:17 157:17 160:14 source 40:11,18 76:24 sources 108:7 108:19 118:21 146:1 south 1:15 southeast 13:23 80:19 111:4 space 93:13 122:4 spacing 41:23 65:20 112:18 spatial 32:12 speak 64:4 69:19 75:17 76:5,25 114:21 speaker 7:17 70:15 151:16 159:13,17,21 159:25 160:3,6 160:11,15 speaking 91:11 114:22 124:16 125:24 speaks 63:11 special 114:2 154:21 155:5 156:8 specialist 2:14 120:23</p>	<p>specific 14:17 20:11 32:19 37:4,4,23 51:6 51:15 79:9 124:20 149:25 150:2,3 154:18 155:8 156:15 specifically 52:4 69:20 123:5,18 125:6 128:18 140:14 149:24 specified 112:3 141:20 specify 46:13 spend 138:21 147:12 spinner 111:5 sponsoring 94:7 spread 65:25 springs 36:3,18 54:11 69:2,11 81:15 squirrel 139:9 155:19 squirrels 99:6 srt 51:19 91:1 121:24 124:2,3 124:7,8,21 125:7,12 126:22 127:3 127:22 130:2 131:8,15 132:20 133:1</p>	<p>135:9 143:24 srts 54:22 74:18 124:16 125:1 128:24 150:12 staff 85:10 stagnant 112:13 stake 146:19 stand 48:20 113:11 standard 42:7 57:7 58:17 65:15,16 72:7 73:3 101:2 115:6 123:19 123:21 128:14 154:13,21 155:18 156:7 standards 103:9 122:16 stands 69:9 start 53:20 67:8 71:4 125:16 158:15 started 15:10 75:4 86:10 starting 65:1 71:22 144:18 starts 15:11 state 1:1 10:13 28:17 30:3 46:20 64:23 76:18 117:13 119:14 120:18</p>
---	--	--	--

[state - suppose]

<p>122:3 153:18 153:22 161:21 stated 17:16 33:13 126:2 statement 25:24 87:12 93:5,6 97:1 113:1 statements 106:14 151:20 states 30:2,6 112:7,7,10 117:17 static 75:18 112:9 station 76:6,12 status 114:8 statute 58:23 93:14 95:9 149:19 stay 16:21 110:24 stays 118:7 step 35:24 50:1 50:5,15 54:6,7 74:21,24 75:2 83:13 97:13,20 105:22 121:23 127:16 132:15 134:2 135:1 141:15,25 142:1 158:17 stepping 92:14 steps 146:22,24 152:15 157:20</p>	<p>stimulation 72:13 stint 30:5 stip 121:1 stipulate 115:8 stone 129:5 148:22 stones 27:9 92:14 stops 55:10 storage 29:19 110:10 streams 79:22 strength 38:22 strictly 149:22 strike 16:21 81:24 strikes 154:20 structure 49:17 79:24 118:3 structured 83:22 structuring 33:9 struggling 139:15 studies 21:16 45:10 styling 19:19 20:10 subject 127:19 submit 8:16 133:1 submitted 9:10 31:9 49:22</p>	<p>74:11 122:7 156:23 submitting 62:10 146:25 subsequent 113:23 substance 31:16 62:14 substantial 33:1 substantive 13:1 159:8 substitutable 90:25 subsurface 33:1 71:8 success 83:11 140:3 successful 35:2 65:4 72:3 93:19 112:14 successfully 35:6 78:4 suddenly 57:1 sufficient 63:5 102:12 sufficiently 103:1 suggested 146:25 suggesting 21:12 suitable 71:7 suites 74:10</p>	<p>summaries 15:16 summarize 13:7 14:7 43:10 68:23 72:10 74:20 summarized 12:6 30:11 157:18 summarizes 14:13 summary 11:22 13:12 29:10 38:16 45:19 51:6 54:5 84:14 101:5 102:19 121:18 122:24 130:2 support 4:7 18:19 25:24 26:2,4,7,8,13 54:4 55:3 66:1 68:4 93:25 94:23 104:4 108:9,12,14 122:25 151:8 158:1 supported 39:14 45:8,12 supporting 91:19 supports 53:19 113:2,20 suppose 158:7</p>
--	--	--	---

[surcharge - territory]

<p>surcharge 118:6</p> <p>sure 16:19 25:1 56:10 60:14 65:2 107:20 111:21 114:9 116:1 122:3 127:14 134:21 138:22 139:18 140:21 141:4 151:24 154:11 154:16 157:3 158:3</p> <p>surface 39:17 49:21,21 53:3 71:1,6 73:25 106:3 122:1 125:17 126:24 128:9 142:9 143:11</p> <p>surrounding 148:25</p> <p>surveying 30:2</p> <p>surveys 47:4</p> <p>swallowed 42:23</p> <p>swd 37:25 42:8 57:7 61:1 63:24 98:2,6 99:3,4,10,16 112:20 123:22</p> <p>swds 47:25 65:15 89:7,18 124:2 138:20</p>	<p>swear 10:1 120:3</p> <p>swearing 11:3 11:5</p> <p>sworn 10:6 28:9 120:8 137:7,8,12 161:5</p> <p>synergistic 64:20 65:6</p> <p>system 35:3 41:17 47:23 55:25 57:25 108:21 110:9</p> <p>systems 73:6 112:1</p> <p style="text-align: center;">t</p> <p>t 4:1 5:1 28:19</p> <p>tab 4:3,5,7,8,9 4:10 7:7,12,14 7:21,22 8:2,7 8:12 9:16,16</p> <p>tabs 9:10</p> <p>take 21:16 32:23 35:23 39:11 46:11 57:1 61:25 70:9 77:4,12 77:16 83:13 86:15 89:14 94:11 95:12 108:1 113:9 115:20 116:8 129:20 139:14 143:6 152:15</p>	<p>153:23,25 158:5</p> <p>takeaway 52:7 131:5 145:11</p> <p>takeaways 34:22 38:17</p> <p>taken 161:3,12 162:9</p> <p>takes 72:23</p> <p>talk 19:11 74:18 105:7 111:18 115:8 126:11 141:21</p> <p>talked 26:10 58:9 62:22 89:5 106:12 122:20 148:18</p> <p>talking 34:3 41:21,23 62:23 72:15 73:18 80:23 145:17 154:21</p> <p>tame 130:22</p> <p>tandem 136:8</p> <p>tangentially 39:25</p> <p>tank 29:20</p> <p>target 33:16</p> <p>task 97:8</p> <p>tech 30:8</p> <p>technical 13:9 13:13 18:21 19:9 23:10 68:21 122:15</p>	<p>tell 10:7 28:10 104:8 115:10 115:19 120:9 129:16 130:12 130:15 137:13 159:24</p> <p>tells 138:10 143:25</p> <p>template 83:24 101:12,20 115:6 155:18 156:7</p> <p>templates 154:21 155:4</p> <p>ten 82:20 86:2 86:5 102:22 134:1,9,16 135:23 136:3,3 136:13</p> <p>tend 34:17 41:9 106:8 134:7</p> <p>tendency 82:7</p> <p>tendered 30:24</p> <p>term 62:6 83:18 84:7,8 84:11 114:2</p> <p>terms 16:7 38:18 44:23 63:10 72:14 77:23 80:12 83:4 104:3 106:17 148:9 149:20 157:18</p> <p>territory 113:25</p>
--	--	---	---

[test - think]

<p>test 49:14 50:1 50:5,15 53:23 54:6,7 74:24 75:2,14 90:15 90:20,22,23 91:5 97:14,24 97:24 105:23 121:24,24 123:11 124:21 125:22 126:22 126:22,23 127:9,16 132:16 134:2 135:2,9,10 138:11,16 141:15,25 142:13 tested 71:12 142:6 testified 10:8 28:11 30:19 36:12 80:16 120:10 137:14 testify 119:21 testifying 88:10 161:5 testimony 6:22 11:8 13:1 17:2 17:15 19:20 20:21 26:21 31:16 34:1 41:20 44:25 55:2 58:6 59:7 65:23 79:12 80:18 88:2,12</p>	<p>89:5 90:1 91:9 93:8,17 100:17 105:12 111:21 121:18,19 132:18 135:19 144:10 151:1 155:6,25 156:9 testing 20:1,12 23:23 47:3 49:14 62:3 73:9,17 74:21 75:15 92:23 106:17 113:12 121:23 127:24 128:3,4 131:7 143:9 149:18 tests 45:11 54:18 90:18 97:20 123:20 124:2 128:25 131:9 texas 4:22 5:5 32:2 53:1,10 53:14 64:22 76:7 82:25 117:9,24 118:5 152:11 153:23 thank 7:1,20 8:14 9:8,18,20 13:15,16 14:4 20:18 21:22,25 22:18 23:1 25:4,5,8 26:15 26:19 28:12,15 85:18,20,22,23</p>	<p>87:2 91:7 95:15,25 100:12 105:6 111:14,20 113:21 116:20 116:22 119:6,6 119:9,25 120:12 123:24 125:5 132:7 133:10,11,12 134:23 135:16 135:18 137:24 144:7,9,16,21 147:18,20,23 150:23,24,25 151:10,11,12 157:3,13 158:6 159:13 160:16 160:18,22 thanks 22:4 85:23 87:5 100:17 theme 74:15 theoretically 155:20 156:3 thing 10:22 40:25 59:20 73:2 77:18 89:10 91:8 95:10 96:9 101:19 103:7 103:11 107:8 107:21 109:23 things 12:2 34:17 36:22,23</p>	<p>40:12 47:3 58:6 65:8 70:20 71:20 74:23 79:2 87:21 95:1 96:12 100:18 101:15 103:4,8 103:21 107:15 108:22 119:17 130:20 154:10 158:12,13 think 19:24 22:23 24:25 25:3 27:7,11 28:2 32:12 34:24 36:11 37:3 39:4 40:9 41:19 42:6 43:14 46:24 48:17,21 51:5 55:5 56:6 57:20 58:14,22 59:20 60:20 62:22 63:18,18 64:7,10 65:8 68:1 71:5 74:22 75:24 76:7,16 78:9 80:17 82:16 83:9,12,15 84:11,12 85:6 87:13 91:16 94:10,24 95:4 96:10,18 100:3 104:9,23,24</p>
--	--	---	--

[think - tremaine]

106:8 110:11 111:13 113:10 114:1,6 115:2 115:3,11,11,21 127:14,17 133:9 139:14 141:7,11,16 142:18,21 144:17 145:8 146:13 147:24 148:16 149:6,7 149:9,21,24 150:8,14 151:14,25 152:9,10,14,16 152:22 153:4,6 153:11 154:5,8 154:10,10,17 155:1,16 156:9 156:10,23,25 158:14 159:14 thinking 48:12 64:18 94:13 108:1 116:14 154:6,13 155:22 third 109:5,11 thought 49:12 58:12 116:15 141:15 142:25 thoughtful 145:9 151:2 thoughtfulness 144:25	thoughts 114:23,25 154:7 three 15:5,7,8 18:9 33:3,7,12 44:19 63:18 66:6 70:12 76:9 129:17 147:25 throwing 71:21 thursday 1:9 tight 134:12 time 21:4,14,17 31:3 33:15 34:13 35:25 39:5,7,10 43:15 46:13 49:7 51:24 55:23 58:11 59:14 60:20 70:6 77:15 86:8 88:7 97:14 100:21 102:24 114:18 116:21 118:25 127:24 129:9 130:19 135:11 138:10,21 144:24 145:6 146:21 147:11 147:13,13 148:23 150:25 156:12 157:14 times 15:16,17 71:16 134:19	today 15:15 47:16 65:24 79:12 87:7 90:13 91:15 94:12 111:21 114:20 116:20 121:18,19 122:8 133:7 145:17,23 146:2 147:12 152:22 together 15:23 17:6 36:4 93:25 104:15 106:24 108:9 118:20 131:9 147:2 150:18 155:3,4,15 157:9 158:1 tom 2:13 137:11 tool 55:5 76:3 78:10 99:25 106:15 138:1,1 tools 129:2 131:2 top 69:2,11,16 71:1 111:5 139:3 touched 37:3 towards 39:5 48:1 100:10 trace 154:24 track 156:9	traction 55:25 trailing 145:7 transcriber 162:1 transcript 162:3,5 transcriptionist 161:8 transducers 77:7 transparent 146:7 travel 42:1 treated 56:23 tremaine 2:6 3:4,8,13 9:19 9:20 10:12,15 10:22,25 11:9 12:16,23,24 13:8,11,16,17 21:20,22 22:23 22:25 27:20,23 28:1,6,14 31:3 31:13 37:15,18 37:20 69:13 80:9 85:17 86:12,16 98:14 98:16 119:10 119:12 120:1 120:14 121:1 121:14 123:15 123:24,25 131:19,22 140:19,20 144:13,15,23
--	--	---	---

[tremaine - university]

<p>146:23 147:21 147:22 150:23 trend 51:11 trick 59:9 tried 62:8 true 54:22 78:1 78:16 103:11 124:20 125:4 127:7,10 133:8 161:9 162:5 truly 48:1 109:7 148:2,16 152:1 truth 10:7,7,8 28:10,10,11 120:9,9,10 137:13,13,14 try 89:22 trying 34:12 42:21 69:22 73:4 82:11 83:12 93:22 105:9 114:16 tubing 71:25 97:14,22 126:13,13 134:14 136:8 turn 6:25 22:8 22:22 77:21 151:18 two 6:4,18 7:3 7:5 8:17 9:1,11 9:11 13:13 15:15 18:1 22:16 23:22</p>	<p>25:12 32:21 37:24 42:6 43:5,20,22,23 44:5,6 45:4,7 54:11 63:18 66:1 67:10 84:13,24 88:13 88:15,22,24 89:2 99:2,4 102:21,22 104:15,20 106:24,24 112:8 113:8 117:17,17 128:4,5 130:9 139:5 142:7 146:14 152:23 154:10 157:11 157:13,19 type 32:6 40:16 57:24 74:8 79:21 97:3 107:8 112:18 126:13 146:3 149:13 types 24:23 25:1 88:22 89:2 123:19 typewriting 161:7 typical 31:21 73:20 typically 33:11 50:1 60:17 112:19 127:2</p>	<p>u u&m 108:21 u.s. 29:23 uic 2:12 11:18 12:3 28:22,25 29:4,11,13 36:14 40:19 48:13 60:12 63:1 68:18 83:21 101:11 104:10 110:14 112:10 113:4 ultimately 85:12,14 150:7 ultimatum 85:6 unanimously 159:5 uncertain 61:15 uncertainty 43:1 148:5 unclear 114:19 uncommon 59:10 88:1 92:8 under 29:5 46:20 49:19 58:23 68:17 74:5 75:16 78:22 79:5 90:11 95:9 106:2 110:14 112:6 138:6 149:11,18</p>	<p>underground 28:22 29:19 31:1,6 120:24 121:4 146:1 understand 6:22 35:1 40:14 68:10 75:25 82:11 86:14 100:21 143:19 146:21 understanding 20:13 23:12 32:12 40:5 48:7 55:17,19 55:21 56:20 90:2,20 105:24 109:17 110:2 understood 103:10 unfortunately 86:19 153:18 unidentified 7:17 70:15 151:16 159:13 159:17,21,25 160:3,6,11,15 uniform 64:18 unique 133:6 uniqueness 113:18 unit 44:2 48:3 united 30:2,6 university 4:22 32:2</p>
--	--	--	--

[unknown - waste]

<p>unknown 19:25 update 159:9 159:14 updated 156:16 158:11,21 updates 150:11 upgraded 97:15 upper 33:13 36:3 96:16,21 110:19 usage 112:18 use 32:3,7 45:20 59:17 63:22 68:7 72:20 77:16 92:20 94:19 101:11 103:13 106:20 108:15 108:15,16,25 115:6 133:25 135:9,9 139:17 139:22,23 used 19:15 39:21 42:19 54:8,12,15,18 69:16 75:21 99:25 108:24 112:18 125:22 using 65:1 84:15,16 93:15 96:20 109:12 126:13,14 136:7 139:20 154:20 155:4</p>	<p>157:12 usual 136:4 usually 103:12 138:12 utilize 43:4 58:25 59:19 66:17 78:2,11 113:13 129:2 135:3 utilized 15:15 42:8 66:2,14 utilizing 43:5 93:12</p>	<p>violation 110:25 virginia's 143:18 virtual 35:10 39:6 43:8 137:16 visit 102:25 vitae 30:13 121:5 vital 55:5 vocation 92:21 volume 76:9 81:20 82:4 83:8 106:1,4 107:18 volumes 15:14 82:19 155:13 voracity 22:19 vote 158:25</p>	<p>103:6 104:23 104:24 105:2 110:8 111:18 113:13,13 115:18,20,20 116:2 117:22 127:14 128:11 128:13,14 134:13 138:22 138:22 139:20 139:24 140:18 140:20,21,23 141:4 142:11 145:14 148:19 149:10 wanted 7:4 13:14 24:16 66:3 138:15 140:22,23 150:6 wanting 140:14 wants 94:2 103:20 104:2 warning 129:3 129:5 131:1 warranted 79:13 washout 41:7 waste 29:18,20 35:6 39:17 41:1,8 56:11 95:12,13,14 117:19 122:17 123:3 131:16 145:25 152:14</p>
	v		
	<p>variations 78:6 variety 54:20 71:14 76:15 108:19 various 14:2 vast 63:19 verified 25:19 versed 19:11 versus 37:12 46:20 81:20 118:12 141:11 142:1 vertical 72:15 vesicle 117:7 vested 89:23 viability 146:3 view 88:17 91:21,22 violate 42:4 violated 41:5</p>		
		w	
		<p>wait 21:10 23:20 waiting 86:12 walk 31:15 62:13,19 74:8 116:8 walked 7:8 want 21:13 27:2,3 42:23 46:22,22 47:2 48:11 53:22 56:24,25 60:7 71:24 73:16 77:24 81:18</p>	

[waste - witness]

<p>157:5 watches 153:23 water 6:18 19:23 29:6 34:2,17 59:5 64:6 66:25 67:4 79:11 80:19 89:25 90:21 99:14,17 117:5,9,24 118:6 129:8 130:11,23 143:15,19 146:1 148:4 151:20 153:8,8 153:17,17,17 153:20,24,25 157:7 water's 119:4 way 8:20 18:18 23:21 65:2 69:9 75:8 76:3 94:8 110:5,6 115:3 136:14 140:6 142:24 145:24 ways 112:8 154:6 we've 19:18,20 34:24 36:7,17 36:18 38:23 41:2 43:2 49:13 51:18 54:8,9 55:2 57:16 58:8</p>	<p>59:12,21 60:4 61:13 62:22 64:9,21 68:6 70:17,24 72:9 73:4,25 75:11 83:10 92:2,6 94:20,24 108:24 114:10 114:10,17 116:17 118:24 127:15 128:1 145:12 148:13 150:4 154:3 157:19 158:3 weakest 128:8 weighs 99:12 welcome 100:14 133:13 wellbore 45:12 wells 6:18 15:2 15:13,20,22 18:2,3,12,12,15 18:23,23 20:7 21:12 25:13,19 26:5 29:4 37:25 38:7 39:13,16,19 42:12 43:19,22 43:23,24,25 44:1,5,6,19,20 44:21,23,24,24 45:5,7,13,18,20 45:21,25 46:9 46:20 47:11,20 48:3,7,8 51:25</p>	<p>52:7 53:4,15 54:11 55:4 57:18 62:1,4,6 63:3,12,22 64:18,22 65:20 65:22 66:4,8 66:16 70:18,18 70:19,25 71:10 71:11 72:14,15 72:16 74:6 75:22,22 77:2 77:2,5,5,6,13 77:14 81:7 82:12,15 88:13 88:15 89:7 93:10,20 99:3 99:4,10,17 100:1,1,9 101:15,16,17 102:7,12 103:13 107:21 112:15 122:11 123:22 127:19 133:2 139:5 146:12,14 152:23 153:9 wendell 1:14 went 24:2 39:5 39:7,13 42:15 47:18 78:4 111:4 144:25 west 51:10 130:25 whatsoever 140:24</p>	<p>wilderness 30:7 william 2:4 willing 107:5,6 118:20 141:7 155:2 willingness 145:6 win 146:8,8 wind 114:19 window 66:20 wireline 46:16 wisdom 153:19 wise 14:10 wish 72:7 107:15 wishes 63:20 withdrawn 38:24 39:4 withdrew 98:8 witness 2:13 4:9 7:8,12 9:22 10:1,6,9,24 13:12 21:24 25:7,10 27:25 28:9 30:21,22 31:10 37:16 69:6 70:16 116:24 119:11 120:3,8,12 123:16,17,21 132:5 133:17 137:5,7,12,17 144:12,16 161:4</p>
---	---	---	--

[witness's - zones]

<p>witness's 10:23 witnesses 3:2 7:9,10 18:21 19:9 24:18 88:10 140:23 141:1 144:14 144:15 145:3 wolfcamp 81:15 woodford 68:7 word's 104:21 work 21:8 27:6 74:3,16 82:23 83:10 87:6 97:1,3,7 102:2 102:9 108:16 108:17 118:20 133:4 147:1 150:18 158:1 worked 29:16 145:7 working 26:11 33:23 54:10 85:6 104:17,18 115:11 134:15 157:9 works 12:1 27:17 workshop 52:12 world 72:13 worry 72:16 82:25 106:7 worst 43:15</p>	<p>worth 50:7 worthy 42:13 43:7 wrap 44:9 writ 152:21 write 110:21 115:19 155:6 written 32:1 152:3 wrong 148:15 wyoming 29:24 30:4</p> <p style="text-align: center;">x</p> <p>x 3:1 4:1 5:1 xto 23:16</p> <p style="text-align: center;">y</p> <p>yeah 8:19 23:5 25:11,11 37:10 38:2 52:24 63:15,16 64:11 74:22 75:15 99:21 100:17 102:17 108:18 120:1,20 127:12 128:16 131:4 133:16 134:16 135:18 136:10,11,16 137:1,1,1,3,6 139:1 140:1,16 142:23 143:17 152:5,19 155:14 157:17</p>	<p>year 12:5 82:14 84:1,11,20,24 102:21 115:25 119:16 160:13 years 11:25 29:13 78:23 82:20 84:13,18 100:25 102:22 102:22 104:15 104:20 108:24 109:1 115:8 116:5 155:13 yellow 37:9 yep 98:13 yesterday 6:20 7:2 8:15 19:20 20:19 24:20 26:10 33:25 40:2 41:14 44:25 52:25 55:1 65:24 72:9 80:18 81:21 88:9 89:5 91:19 93:18 94:12 114:17 132:14 136:18 137:8 146:2 yesterday's 41:20</p> <p style="text-align: center;">z</p> <p>z 28:19 zero 70:8 zone 18:13,14 23:7 61:8</p>	<p>96:22 122:4 125:11 127:6 129:19 130:13 130:15 152:18 152:21,25 154:25 zones 14:12 66:25 130:9 143:8</p>
---	---	--	---