

**IN THE DISTRICT COURT OF THE FOURTH JUDICIAL DISTRICT
OF THE STATE OF IDAHO, IN AND FOR THE COUNTY OF ADA**

IDAHO GROUND WATER
APPROPRIATORS, INC.,

Petitioner,

vs.

IDAHO DEPARTMENT OF WATER
RESOURCES, and GARY SPACKMAN
in his capacity as the Director of the Idaho
Department of Water Resources.

Respondents,

and

AMERICAN FALLS RESERVOIR
DISTRICT #2, MINIDOKA
IRRIGATION DISTRICT, A&B
IRRIGATION DISTRICT, BURLEY
IRRIGATION DISTRICT, MILNER
IRRIGATION DISTRICT, NORTH SIDE
CANAL COMPANY, TWIN FALLS
CANAL COMPANY, CITY OF
POCATELLO, CITY OF BLISS, CITY
OF BURLEY, CITY OF CAREY, CITY
OF DECLO, CITY OF DIETRICH, CITY
OF GOODING, CITY OF HAZELTON,
CITY OF HEYBURN, CITY OF
JEROME, CITY OF PAUL, CITY OF
RICHFIELD, CITY OF RUPERT, CITY
OF SHOSHONE, AND CITY OF
WENDELL, BONNEVILLE-JEFFERSON
GROUND WATER DISTRICT, and
BINGHAM GROUNDWATER
DISTRICT,

Intervenors.

Case No. CV01-23-13173

IN THE MATTER OF THE
DISTRIBUTION OF WATER TO
VARIOUS WATER RIGHTS HELD BY
AND FOR THE BENEFIT OF A&B
IRRIGATION DISTRICT, AMERICAN

FALLS RESERVOIR DISTRICT #2,
BURLEY IRRIGATION DISTRICT,
MILNER IRRIGATION DISTRICT,
MINIDOKA IRRIGATION DISTRICT,
NORTH SIDE CANAL COMPANY,
AND TWIN FALLS CANAL COMPANY

SETTLED AGENCY HEARING TRANSCRIPT ON APPEAL

Judicial Review from the Idaho Department of Water Resources
Gary Spackman, Director, Presiding

RAÚL R. LABRADOR
ATTORNEY GENERAL

SCOTT L. CAMPBELL
Chief of Energy and Natural Resources
Division

GARRICK L. BAXTER, ISB No. 6301
KAYLEEN R. RICHTER, ISB No. 11258
Deputy Attorneys General
Idaho Department of Water Resources
P.O. Box 83720
Boise, Idaho 83720-0098
Telephone: (208) 287-4800
Facsimile: (208) 287-6700
garrick.baxter@idwr.idaho.gov
kayleen.richter@idwr.idaho.gov

Attorneys for Respondents

Sarah A. Klahn
Maximilian C. Bricker
SOMACH SIMMONS & DUNN, P.C.
1155 Canyon Blvd., Suite 110
Boulder, CO 80302
Telephone: (303) 449-2834
sklahn@somachlaw.com
mbricker@somachlaw.com

Attorneys for City of Pocatello

Thomas J. Budge
Elisheva M. Patterson
RACINE OLSON, PLLP
201 E. Center St. / P.O. Box 1391
Pocatello, Idaho 83204
Telephone: (208) 232-6101
Facsimile: (208) 232-6109
tj@racineolson.com
elisheva@racineolson.com

Attorneys for Petitioner

W. Kent Fletcher
FLETCHER LAW OFFICE
P.O. BOX 248
Burley, Idaho 83318
Telephone: (208) 678-3250
wkf@pmt.org

*Attorney for American Falls Reservoir
District #2 and Minidoka Irrigation
District*

John K. Simpson
Travis L. Thompson
MARTEN LAW LLP
163 Second Ave. West
P.O. Box 63
Twin Falls, Idaho 83303-0063
Telephone: (208) 733-0700
jsimpson@martenlaw.com
tthompson@martenlaw.com

*Attorneys for A&B Irrigation District,
Burley Irrigation District, Milner
Irrigation District, North Side Canal
Company and Twin Falls Canal Company*

Skyler C. Johns
Nathan M. Olsen
Steven L. Taggart
OLSEN TAGGART PLLC
P.O. Box 3005
Idaho Falls, ID 83403-3005
Telephone: (208) 552-6442
Facsimile: (208) 524-6095
sjohns@olsentaggart.com
nolsen@olsentaggart.com
staggart@olsentaggart.com
icourt@olsentaggart.com

*Attorneys for Bonneville-Jefferson Ground
Water District*

Dylan Anderson
DYLAN ANDERSON LAW PLLC
P.O. Box 35
Rexburg, Idaho 83440
Telephone: (208) 684-7701
dylan@dylanandersonlaw.com

*Attorney for Bingham Groundwater
District (BGWD)*

Candice M. McHugh
Chris M. Bromley
MCHUGH BROMLEY, PLLC
380 S. 4th St., Ste. 103
Boise, ID 83702
Telephone: (208) 287-0991
Facsimile: (208) 287-0864
cmchugh@mchughbromley.com
cbromley@mchughbromley.com

*Attorneys for the Cities of Bliss, Burley,
Carey, Declo, Dietrich, Gooding,
Hazelton, Heyburn, Jerome, Paul,
Richfield, Rupert, Shoshone, and Wendell*

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO

IN THE MATTER OF DISTRIBUTION OF)
WATER TO VARIOUS WATER RIGHTS)
HELD BY OR FOR THE BENEFIT OF A&B) DOCKET NO.
IRRIGATION DISTRICT, AMERICAN) CM-DC-2010-001
FALLS RESERVOIR DISTRICT #2,)
BURLEY IRRIGATION DISTRICT,)
MILNER IRRIGATION DISTRICT,)
MINIDOKA IRRIGATION DISTRICT,)
NORTH SIDE CANAL COMPANY, AND)
TWIN FALLS CANAL COMPANY)
_____)

BEFORE

HEARING OFFICER: GARY SPACKMAN

VOLUME I

Date: June 6, 2023 - 9:03 a.m.
Location: Idaho Department of Water Resources
322 East Front Street
Boise, Idaho

REPORTED BY:

COLLEEN P. DOHERTY, CSR 345

Notary Public

1 APPEARANCES:

2 For the City of Pocatello:

3 SOMACH SIMMONS & DUNN, P.C.

4 BY MS. SARAH A. KLAHN

5 MR. MAXIMILIAN BRICKER

6 1155 Canyon Street, Suite 110

7 Boulder, Colorado 80302

8 sklahn@somachlaw.com

9 mbricker@somachlaw.com

10 For the Cities of Bliss, Burley, Carey, Declo, Dietrich,

11 Gooding, Hazelton, Heyburn, Jerome, Paul, Richfield,

12 Rupert, Shoshone, and Wendell:

13 MCHUGH BROMLEY, PLLC

14 BY MS. CANDICE M. MCHUGH (Present Remotely)

15 BY MR. CHRIS M. BROMLEY

16 380 South 4th Street, Suite 103

17 Boise, Idaho 83702

18 cmchugh@mchughbromley.com

19 cbromley@mchughbromley.com

20 Attorney for City of Idaho Falls and City of Ammon:

21 HOLDEN, KIDWELL, HAHN & CRAPO, PLLC

22 BY MR. ROBERT L. HARRIS

23 1000 Riverwalk Drive, Suite 200

24 Idaho Falls, Idaho 83405-0130

25 rharris@holdenlegal.com

1 APPEARANCES (Continued):

2 For Idaho Ground Water Appropriators, Inc.:

3 RACINE OLSON, PLLP

4 MR. THOMAS J. BUDGE

5 BY MS. ELISHEVA M. PATTERSON

6 201 E. Center Street

7 Pocatello, Idaho 83204

8 tj@racineolson.com

9 elisheva@racineolson.com

10 For Ground Water Districts:

11 RIGBY ANDRUS & RIGBY LAW, PLLC

12 BY MR. JERRY R. RIGBY

13 25 North Second East

14 Rexburg, Idaho 83440-0250

15 jrigby@rex-law.com

16 For Bonneville-Jefferson Ground Water District:

17 OLSEN TAGGART PLLC

18 SKYLER C. JOHNS

19 1449 E 17th Street

20 Idaho Falls, Idaho 83403

21 sjohns@olsentaggart.com

22

23

24

25

1 APPEARANCES (Continued):

2 For Bingham Ground Water District:

3 DYLAN ANDERSON LAW

4 BY MR. DYLAN ANDERSON

5 P.O. Box 35

6 Rexburg, Idaho 83440

7 dylan@dylanandersonlaw.com

8 For the Surface Water Coalition, Twin Falls Canal
9 Company, North Side Canal Company, and Milner Irrigation
10 District, A & B, Burley Irrigation District:

11 MARTEN LAW

12 BY MR. JOHN K. SIMPSON

13 BY MR. TRAVIS L. THOMPSON

14 101 S. Capitol Boulevard, Suite 305

15 Boise, Idaho 83701-2139

16 jsimpson@martenlaw.com

17 tthompson@martenlaw.com

18 For the Minidoka Irrigation District, AFRD#2:

19 FLETCHER LAW OFFICE

20 BY MR. W. KENT FLETCHER

21 1200 Overland Avenue

22 Burley, Idaho 83318-0248

23 wkf@pmt.org
24
25

APPEARANCES (Continued)

For the Department of Water Resources:

OFFICE OF ATTORNEY GENERAL

IDAHO DEPARTMENT OF WATER RESOURCES

BY MR. GARRICK BAXTER (Present Remotely)

BY MR. PETER WOOD

322 E. Front Street

Boise, Idaho 83720-0098

garrick.baxter@idwr.idaho.gov

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

W I T N E S S E S

		PAGE
	TESTIMONY OF JENNIFER SUKOW	
	Direct Examination by Mr. Wood	37
	Cross-Examination by Ms. McHugh	39
	Cross-Examination by Ms. Klahn	60
	Cross-Examination by Mr. Budge	63
	Cross-Examination by Mr. Harris	88
	Cross-Examination by Mr. Anderson	95
	Cross-Examination by Mr. Simpson	96
	Redirect Examination by Mr. Wood	103
	TESTIMONY OF DAVID COLVIN	
	Direct Examination by Mr. Thompson	106
	Cross-Examination by Mr. Bricker	110
	Cross-Examination by Mr. Budge	116
	TESTIMONY OF MATTHEW "MATT" ANDERS	
	Direct Examination by Wood	119
	Cross-Examination by Ms. Klahn	124
	Cross-Examination by Mr. Anderson	150
	Cross-Examination by Mr. Harris	161
	Cross-Examination by Mr. Budge	166
	Cross-Examination by Mr. Bromley	213

I N D E X (Continued)

	PAGE
TESTIMONY OF MATTHEW "MATT" ANDERS	
Cross-Examination by Ms. McHugh	216
Cross-Examination by Mr. Thompson	219
Redirect Examination by Mr. Wood	222
Recross-Examination by Mr. Budge	224

E X H I B I T S

EXHIBIT NO. AND DESCRIPTION	MARKED	RECEIVED
Exh 300 - 4/21/2023 Fifth Amended Final Order	40	59
Exh 301 - 4/21/2023 Final Order Regarding April 2023 Forecast Supply	42	59
Exh 318 - 11/28/2022 IDWR, SWC Methodology	48	51
Exh 305 - 4/20/2022 Final Order Regarding April 2022 Forecast Supply	57	59
Exh 914 - 20221223 IDWR Preliminary Recommendations	65	
Exh 197 - Attachment 1 - IGWA Proportionate Share Modeling	76	

I N D E X (Continued)

E X H I B I T S

	EXHIBIT NO. AND DESCRIPTION	MARKED	RECEIVED
1			
2			
3	EXHIBIT NO. AND DESCRIPTION	MARKED	RECEIVED
4	Exh 929 - Depo Exhibit 18, CM	80	
5	Rules		
6	Exh 126 - Depo Exhibit 8,	84	
7	20230503 Baxter Email Re: GWD		
8	Mitigation Obligations		
9	Exh 3 - Ground Water Expert	107	109
10	Report - 2023 Methodology		
11	Exh 306 (Exh 135) - 4/19/2016	116	135- 135
12	Fourth Amended Final Order		306- 149
13	Exh 324 - 2/19/2015 Proposed	133	148
14	Modification to Method for		
15	Determining Reasonable In-Season		
16	Demand (Anders Dep Exhibit 13)		
17	Exh 325 - 12/1/2022 Proposed	137	148
18	Modification to Method for		
19	Determining Reasonable In-Season		
20	Demand (Anders Dep Exhibit 14)		
21	Exh 362 - Copy of Contract	145	
22	Between State Board of Land		
23	Commissioners and Twin Falls		
24	Land & Water Company, 1/2/1903		
25			

I N D E X (Continued)

E X H I B I T S

3	EXHIBIT NO. AND DESCRIPTION	MARKED	RECEIVED
4	Exh 914 - 20221212 IDWR Prelim	157	
5	Recommendation		
6	Exh 915 - 20230116 Cities	179	180
7	Comments on SWC Methodology		
8	Recommendation		
9	Exh 916 - 20230116 Lynker Memo	179	180
10	Re: IDWR Staff Recommendations		
11	Exh 103 - 2015 Technical Memo	182	186
12	from Liz Cresto and Anders to		
13	the Director		
14	Exh 901 - 20221117 Forecast	184	
15	Supply SWC TWG		
16	Exh 928 - Depo Ex 17, 20221201	202	
17	NRT Metric SWC TWG 12/1/22 with		
18	Supplemental Slides		
19	Exh 929 - Depo Exhibit 18, CM	207	
20	Rules		
21	Exh 118 - 20230116 SWC Comments	219	230
22	to IDWR Re: Methodology Update		
23			
24			
25			

1 THE HEARING OFFICER: Welcome everyone, old
2 acquaintances. I have to characterize most of you in
3 that category. We're set up a little differently than
4 we normally set up. And I'm not sure I like it. Many
5 of you seem to be in distant view from this location.
6 So it seemed to me, we needed at least in the past have
7 been a little more intimate in another set up. We
8 arranged the furniture this way, because we have some
9 people participating electronically online in remote
10 locations, and we want to make sure that everybody can
11 see the screens, including the Hearing Officer and
12 reporter. So that's the reason for the change.

13 This is the time and place scheduled for a
14 hearing regarding the issuance of a Fifth Methodology
15 Order in the Surface Water Coalition delivery call case.
16 And probably the first matter of business is to
17 introduce everyone here and call roll.

18 So let's start, and we have a court reporter
19 here, that is familiar to many. Colleen, if you would
20 introduce yourself. And then we'll go across the front
21 and go row by row.

22 THE REPORTER: Colleen Doherty, with M&M Court
23 Reporting.

24 THE HEARING OFFICER: I might just add that
25 Colleen has been participating in enough of these

1 hearings that she probably is developed some expertise
2 in the vernacular of water. And so we appreciate M&M
3 Court Reporting and their help.

4 I'm Gary Spackman, the Director of the Idaho
5 Department of Water Resources.

6 MR. WOOD: Pete Wood, attorney for the
7 Department.

8 THE HEARING OFFICER: Let's start with you,
9 Travis, and then wind through.

10 MR. THOMPSON: Travis Thompson with Marten
11 Law, attorney for A & B Irrigation District, et al.

12 MR. FLETCHER: Kent Fletcher, attorney for
13 Minidoka Irrigation District, and American Falls
14 Reservoir District No. 2.

15 MR. BRICKER: Max Bricker with Somach Simmons
16 & Dunn, on behalf of the City of Pocatello.

17 MS. KLAHN: Sarah Klahn with the Somach
18 Simmons & Dunn, also for the City of Pocatello.

19 MR. BROMLEY: Chris Bromley with McHugh
20 Bromley for the Coalition of the Cities, the Cities, et
21 al.

22 MR. HARRIS: Rob Harris with Holden, Kidwell,
23 Hahn & Crapo, on behalf of the City of Idaho Falls.

24 MR. CONTOR: Bryce Contor at Rocky Mountain
25 Environmental with the Idaho Ground Water District.

1 MR. SULLIVAN: And I'm Greg Sullivan with
2 Spronk Water Engineers on behalf of the ESPA Cities, and
3 the City of Pocatello.

4 MR. JOHNS: I'm Skyler Johns with Olsen
5 Taggart, and I represent Bonneville-Jefferson Ground
6 Water District.

7 MR. ANDERSON: Dylan Anderson, Bingham Ground
8 Water District.

9 MR. BUDGE: TJ Budge with Racine Olson, Idaho
10 Ground Water Appropriators.

11 MS. PATTERSON: Elisheva Patterson, Racine
12 Olson, also with the Idaho Ground Water Appropriators.

13 MR. SIMPSON: Good morning. John Simpson with
14 Marten Law, with A & B Irrigation District, et al.

15 MR. COLVIN: Dave Colvin with LRE Water
16 representing IGWA.

17 MR. RIGBY: Jerry Rigby, Ribgy Andrus & Rigby,
18 representing three of ground water districts in IGWA.

19 THE HEARING OFFICER: Then in the back if
20 you'll speak up loudly.

21 MS. SUKOW: Jennifer Sukow, Idaho Department
22 of Water Resources.

23 MS. FERGUSON: Kara Ferguson, Idaho Department
24 of Water Resources.

25 MR. ANDERS: Matt Anders, IDWR.

1 MR. JACKSON: Al Jackson with the Bingham
2 Ground Water District.

3 THE HEARING OFFICER: Thank you, Al.

4 Okay. Now, we need to call roll for those who
5 are participating remotely. So let's start. And I'll
6 just look at the screen. Sarah, are you there?

7 MS. McHUGH: Thank you. You mean, Candice.

8 THE HEARING OFFICER: Candice, did you speak?

9 MS. McHUGH: Yeah. I wasn't sure if you meant
10 Sarah or Candice. Because we have Candice and Sophia, I
11 think who are remote.

12 THE HEARING OFFICER: And we have some others
13 who are listening in. I don't think I'll call the roll
14 for all of those folks. Are there other attorneys who
15 are participating? And we have at least one expert
16 witness participating.

17 MS. SIGSTEDT: Sophia Sigstedt with Lynker on
18 behalf of IGWA.

19 THE HEARING OFFICER: Thank you, Sophia.

20 Okay. I don't know unless there is a need for
21 me to call for others who may be listening in. So the
22 instructions that we sent out regarding electronic
23 participation would be that Candice McHugh and Sophia
24 will be participating in the hearing and either will
25 examine or offer testimony remotely. Everyone else is

1 just listening in, and those folks are not participants
2 in the hearing. And you will be muted for the entirety
3 of the hearing. So that's the instruction. And it's a
4 management requirement for me. Otherwise we would have
5 too many people speaking, and those who are not at least
6 officially parties to this matter.

7 Okay. Let me just check and see if we have
8 everyone. I know there are attorneys --

9 MS. McHUGH: Director, this is Candice. Can I
10 ask --

11 THE HEARING OFFICER: Yes, Candice.

12 MS. McHUGH: I don't know when everyone is
13 speaking if they make objections or something like that.
14 Travis and Kent were fairly, I could hear them fairly
15 well, but Max, Chris, I couldn't hear them, or Jerry
16 Rigby very well. So just kind of wanted to make sure
17 people were by the mics.

18 THE HEARING OFFICER: Okay. Well, Candice,
19 since you raised this issue. So we have a room
20 microphone that's set up, I think overhead for the
21 attorneys. But when an attorney is examining a witness,
22 we would like you to come forward. There is a table in
23 front. And you can deposit your exhibits or other
24 materials on the table. You have a choice of either
25 examining from the lectern or the table, itself. There

1 is a microphone set up in each of those. And the
2 witness will be here to my right.

3 So hopefully the physical arrangement will
4 promote a verbal dialogue that everybody can hear. But
5 if there are objections from the attorneys, we'll ask
6 that you speak up very loudly, so that the microphone
7 will pick up your voice. And so those participating
8 remotely can hear, and the court reporter can record the
9 objection and any of the exchange. So we'll have to be
10 mindful of the need to be outspoken in these discussions
11 today.

12 All right. Let me just look at this list
13 again. The Bureau of Reclamation is not represented,
14 but they've been observers more than anything. Okay. I
15 think we have all of the parties represented today.

16 All right. There are some preliminary matters
17 that we need to talk about. And some either requests or
18 petitions that are pending in front of the Hearing
19 Officer right now. So there is a request for issuance
20 of a subpoena to Mat Weaver and Tony Olenichak to
21 testify as witnesses -- hello -- maybe just a vocal
22 glitch.

23 And so there is a request that the Hearing
24 Officer or the Director issue subpoenas for Mat Weaver
25 and Tony Olenichak. And because of the timing of those

1 requests, and because of the nature of the testimony at
2 least is as anticipated. I have prepared or am
3 preparing an order denying that request to issue
4 subpoenas to those two folks. And I'll issue that
5 shortly and will distribute it by hand.

6 I also have a motion to limit testimony that's
7 pending. And the ground water users, I don't think have
8 had a response or an opportunity to respond. That
9 motion I think came in within the last couple of days.
10 Is there some desire on the part of the petitioners and
11 the ground -- the other -- well, I shouldn't say the
12 ground water users, although I think that's who might
13 oppose the motion.

14 Petitioners, do you wish to orally present any
15 information at this stage?

16 MR. THOMPSON: This is Travis Thompson,
17 Director. Just briefly. We filed this yesterday after
18 looking at the list of the witnesses, proposed
19 testimony, and exhibits. And I guess similar to prior
20 hearings in this matter where parties have requested a
21 hearing on the Director's order, in this case the Fifth
22 Order and the As-Applied Order, we think that the scope
23 of that hearing should be limited to those issues
24 identified there.

25 It looks like to me that we're attempting to

1 go back and redo an administrative hearing we had in
2 2008. That was then subject to a final order and then
3 judicial review. We attached a copy of Judge Wildman's
4 decision to Exhibit A to our motion that comprehensively
5 addresses the methodology.

6 So that was the basis for our motion. I don't
7 have real specifics right now. But I guess as we go
8 through this hearing, we would like a standing objection
9 that if we go beyond the scope of those two orders and
10 issues that are pertinent before the Department, that we
11 would limit that. Thank you.

12 THE HEARING OFFICER: Responses? Mr. Budge.

13 MR. BUDGE: Thank you, Director. TJ Budge on
14 behalf of the IGWA, Idaho Ground Water Appropriators. I
15 guess to begin, the parties did file their statements of
16 issues in this case a month ago. So it's a bit peculiar
17 that we got this served on us the day before the hearing
18 as we're traveling to Boise. We have not had a lot of
19 time to prepare for it. But I do want to share just a
20 few thoughts.

21 If we're going to follow the Coalitions line
22 of reasoning, then the transition from a transient
23 steady state to a transient state model is res judicata.
24 A transient state model was at issue in the earlier
25 hearing in the context of carryover storage. And so

1 it's certainly something the parties were aware of. It
2 was an issue that could have been litigated in that
3 proceeding. And if that is barred by res judicata, then
4 that component of the Fifth Methodology Order must, you
5 know, be reversed.

6 Also, acreage was litigated in that prior
7 proceeding, and the Department accepted the acreage
8 evidence presented by the junior ground water users. We
9 were successful in that. And that would also be
10 res judicata.

11 So if we're going to go that way, we really
12 have to identify what issues are on the table, because
13 it's not a one-way street. You don't get to change just
14 the components that you like, and then claim it's
15 res judicata, so the components you don't like. That's
16 probably not the right approach. And the reason is is
17 that the methodology order is required by law to be
18 based on the best science available. And science
19 changes, facts change, circumstances change. It's not a
20 traditional court order that is locked in place forever.
21 It's more of a living document.

22 And so if we're going to look at more recent
23 data, if we're going to consider changes in science,
24 then we have the ability to look at all components of
25 the methodology and see, is there a compelling reason to

1 change any of the components based on experience,
2 science, and recent data.

3 So for those reasons, we'd ask that the court
4 deny the motion, or the Director deny the motion.

5 THE HEARING OFFICER: Other responses?

6 Mr. Harris.

7 MR. HARRIS: Thank you, Director. Ralph
8 Harris on behalf of the City of Idaho Falls. Just to
9 add to what TJ said, we haven't had the chance to
10 research the matter in depth.

11 But I would draw the Director's attention to
12 the Idaho Supreme Court case of Erickson versus Amoth,
13 which provides the following. Generally the doctrine of
14 res judicata extends only to facts and conditions as
15 they existed at the time the judgment was rendered. And
16 ordinarily res judicata does not apply where there were
17 changed conditions and new facts, which did not exist at
18 the time of prior judgment.

19 The general view is that where after the
20 rendition of a judgment, subsequent events occur
21 creating a new legal situation, or altering the legal
22 rights relations of the litigants, the judgment may
23 thereby be precluded from operating as an estoppel.

24 As Mr. Thompson mentioned, the original order
25 was issued in 2008. There have been change

1 circumstances. In fact, I believe you indicated that
2 was one of the primary reasons you were looking at
3 updating the Fifth Methodology Order. And so for that
4 reason, we think all issues are on the table here today.
5 Thank you.

6 THE HEARING OFFICER: Other statements?

7 MR. ANDERSON: Yes.

8 THE HEARING OFFICER: Dylan, Mr. Anderson.

9 MR. ANDERSON: Just briefly, Director. One of
10 the things that was called out specifically was
11 something that we intend to introduce as part of Bingham
12 Ground Water refers to, you know, the economic impacts.
13 And the Clear Springs Food, Inc. case was cited in that.
14 And I just wanted to just go on into that case. It
15 introduced, or the Springs Food case quoted the AFRD
16 case.

17 And it just said somewhere between the
18 absolute right to use a decreed water right and an
19 obligation not to waste it, and to protect the public's
20 interest in this valuable commodity lies an area for the
21 exercise of discretion by the Director. In that sense,
22 the court recognized some discretion by the Director to
23 look at the reasonableness of diversions, look at the
24 reasonableness of what's required by the senior water
25 right holder. I think that the changes contemplated in

1 the Fifth Methodology certainly would change the
2 reasonableness required by the Department in a sense if
3 you are potentially curtailing ten-fold acreage. The
4 economic impact is increased ten-fold, or actually even
5 exponentially more than ten-fold as it compounds. And
6 so I think that is certainly relevant data for the
7 Department to have, and to understand, and consider in
8 their reasonableness calculations.

9 The sections that were quoted are not
10 necessarily pertaining to limiting any economic
11 information before the Department. And certainly the
12 Supreme Court didn't deem it inadmissible or completely
13 irrelevant. They just simply didn't use that
14 information for that particular argument.

15 So we'd join in the rest of the arguments
16 already stated. Thank you, Director.

17 THE HEARING OFFICER: Other statements?

18 Okay. As I understood what you presented,
19 Mr. Thompson, you were asking for a standing objection.
20 As I look through the list of witnesses and also the
21 issues, it seems to me that many of the witnesses may be
22 called to testify about the economic impacts of
23 curtailment. And as I read -- well, first of all, as I
24 look at the methodology order and component facts that
25 contribute to the development and to the writing of the

1 Fifth Methodology Order, economics was not a part of the
2 underlying facts that were considered. And, in fact,
3 the decisions as I read them that have been issued,
4 stated that economic impact and a comparative analysis
5 of economics is not part of prior appropriation
6 administration.

7 And so I guess what I'm trying to say is, the
8 testimony that I receive in this particular hearing will
9 be limited to the factual components that were a part of
10 the development and writing of the Fifth Methodology
11 Order. And economics were not a part of those facts.

12 And, in fact, as I read the court decisions,
13 the court has said that the economic comparison would
14 actually frustrate and thwart the administration of
15 water under the prior appropriation doctrine. And so I
16 will cut short in the examination, presentation on the
17 respective economic benefits or the economic impacts of
18 possible curtailment under the Fifth Methodology Order.

19 Now, there may be other areas that exploration
20 that are outside of the methodology order, itself, and
21 those areas if there is examination regarding those
22 areas, I will allow objections. And will rule on those
23 objections depending on the relevance to the Fifth
24 Methodology Order.

25 So I'm trying to at least set some boundaries

1 as to the scope of examination. And there may be other
2 areas beyond economics. But it seemed to me that at
3 least the focus on economic issues in looking at the
4 list of witnesses and the issues is not appropriate in
5 this particular hearing. Okay?

6 All right. I don't know that I have any other
7 issues that are pending right now. There may be some
8 additional motions that the parties want to offer, and
9 bring before the Hearing Officer at this point. Are
10 there motions, and pre-hearing motions that the parties
11 wish to offer up?

12 Wow. You're an agreeable crowd.

13 All right. Let's talk about exhibit
14 numbering. There is a little confusion about it. There
15 were specific ranges of numbers that each of the parties
16 were assigned. And I think there has been some
17 adjustment in that numbering.

18 Mr. Budge, you may have gone over your range
19 that was my understanding. But I think the parties had
20 recognized that renumbering. But I think just recently
21 there has been an attempt to try to consolidate
22 exhibits.

23 And I just want to know how the parties want
24 to address that attempted consolidation.

25 Elesheva.

1 MS. PATTERSON: Good morning, Director. Yes,
2 as you can see behind you, there is a lot of paper. And
3 so IGWA filed its initial disclosures. We exceeded our
4 allotted range. And so we also used the 800 numbers.
5 Later after all of the initial disclosures were made,
6 our staff went through and tried to identify common
7 exhibits and numbered those as 900, which were unique,
8 in an attempt to save paper and try to simplify things.
9 And so we have disclosed that to all the parties. I
10 have not received any objection to the amended pre-trial
11 disclosures. But will respond to them if there is any
12 objections.

13 THE HEARING OFFICER: What do the parties want
14 to do?

15 Mr. Fletcher?

16 MR. FLETCHER: Director, it might be helpful
17 to just recite, if you remember, I don't know if you
18 remember the ranges that go to each classification. So
19 that the Director is aware of that.

20 MS. PATTERSON: IGWA was assigned the 100 to
21 199 numbers. And so we do have documents that range
22 from Exhibit No. 100 to 199. Some of those have been
23 removed. And now are labeled as common exhibits. And
24 then we also have exhibits labeled 800 to 837. And
25 again, some of those in the amended pre-trial disclosure

1 were removed. And so this will not be a continuous
2 list, but all documents are uniquely identified for the
3 record. And common hearing exhibits --

4 MS. McHUGH: Elesheva, this is Candice. Did
5 you send us that? In my examination, I just have four
6 exhibits that I refer to in the 300 series. I'm
7 guessing that they have now been renumbered to the 900
8 series. But I think I'm just going to keep them with
9 the 300 series, because I'm at a little bit of
10 disadvantage not having paper to be able to look
11 through, or I could just tell you what they are, and
12 someone could tell me if they are the 900 series, and I
13 can change the exhibit numbers, but...

14 MS. PATTERSON: So that is one issue --

15 MS. McHUGH: I think that might be confusing.

16 MS. PATTERSON: That is one issue with the
17 common exhibits. So IGWA did send out an amended
18 exhibit list where we had removed from our exhibits
19 those that became common. But I don't know that the
20 Cities and other parties were able to do so. But I
21 think as long as we're all identifying, you know, our
22 submitted document, we can keep the record straight.

23 And, Candice, you can use the common exhibits
24 if you would like. And I can try to send you an updated
25 numbering for those to keep things simple.

1 THE HEARING OFFICER: Let me just add that
2 Sarah Tschohl, a paralegal in our office, she has
3 compiled a list of exhibits for me. And she has
4 identified those exhibits that were also designated as
5 common exhibits.

6 And for the benefit of Candice McHugh, I don't
7 show any of the McCain Foods exhibits as being common
8 exhibits at least in my summary.

9 MS. PATTERSON: I think that's correct. We
10 had some exhibits that were common with
11 Bonneville-Jefferson and with the Cities exhibits. But
12 I don't think we had any in common with the McCain Foods
13 or the Coalition.

14 THE HEARING OFFICER: So, Candice, in answer
15 to your question, at least in my summary, your exhibits
16 are numbered 600 through 604. And none of them are
17 common exhibits.

18 MS. McHUGH: Thank you, Mr. Director. First
19 of all, well, I think the Amalgamated's were 600 through
20 604, or I mean McCain's. And Amalgamated's were 700 to
21 703. But I will be examining Jennifer using Coalition
22 exhibits 300, 301, 305, and 318. And I think those are
23 probably Coalition of Cities or -- yeah, the Cities
24 Exhibits 300, 301, 305, and 318. And those are the four
25 exhibits I was specifically talking about.

1 THE HEARING OFFICER: Well, some of those are
2 common.

3 MS. McHUGH: Right.

4 MS. PATTERSON: Candice, if you want to refer
5 to -- Candice, if you want --

6 MS. McHUGH: Tell me what number to refer to,
7 and I'm good with it.

8 MS. PATTERSON: I think since we'll be moving
9 into Jennifer Sukow's --

10 (Interruption had in the proceeding.)

11 THE HEARING OFFICER: Sarah Tschohl, are you
12 there? Somebody wasn't muted.

13 MR. HARRIS: I think it's Katie, whoever Katie
14 is.

15 THE HEARING OFFICER: I don't know who Katie
16 is.

17 MS. PATTERSON: Yeah, Katie, please mute your
18 mic.

19 THE HEARING OFFICER: Sarah, can you impose
20 your draconian hand and mute Katie?

21 MS. PATTERSON: I think she addressed the
22 issue.

23 THE HEARING OFFICER: Okay.

24 MS. PATTERSON: Candice, what I was going to
25 suggest since we're starting out with Ms. Sukow first,

1 and your exhibits that you referenced for the Cities are
2 responsive to that portion of the testimony. Please use
3 those. And we'll just, if we have follow up, we'll
4 refer to the Cities exhibits as IGWA reserve the right
5 to use any exhibits produced by any party.

6 THE HEARING OFFICER: Okay. So without any
7 objection, we'll introduce, if we can, the numbered
8 exhibits that have been identified as common with the
9 numbering identified by IGWA in the 900 series. Is that
10 acceptable to everyone? And I could supply this
11 cross-reference list if people want this list. If it
12 would be beneficial, we could copy it?

13 MR. BROMLEY: That would be.

14 MS. KLAHN: Yes.

15 THE HEARING OFFICER: So at the first break,
16 I'll ask to have this copied and distributed to all of
17 the parties. And we'll be able to refer to a common
18 list of exhibits if that's okay, Elesheva?

19 MS. PATTERSON: Yes. Thank you, Director.

20 THE HEARING OFFICER: Mr. Thompson.

21 MR. THOMPSON: Just to clarify. We're
22 stipulating to the numbering, and not the actual
23 exhibits themselves; is that correct?

24 THE HEARING OFFICER: That's correct.

25 MR. THOMPSON: Okay.

1 THE HEARING OFFICER: My next question was,
2 have the parties stipulated to the admission of any of
3 the exhibits that have been identified? And if they
4 haven't, maybe there is an opportunity as we go through
5 to stipulate to the admission of some of those. It
6 would speed up the hearing significantly if for every
7 exhibit, we didn't have to move for admission.

8 MR. THOMPSON: I think that would be our
9 intent to try and do that. We haven't gone through the
10 entire list of the other parties yet. But the ones
11 we'll admit to, we'll stipulate to.

12 THE HEARING OFFICER: Okay. All right. I
13 have in front of me -- I'll change subjects and not talk
14 about exhibits, unless there is more discussion
15 regarding the exhibits, numbering, and possible
16 stipulation.

17 All right. I want to move to a proposed
18 witness schedule that has been offered to the parties.
19 And at least my understanding is there has been some
20 discussion about the witnesses, and the order in which
21 they'll be called. And I want to refer back to a
22 discussion about the days that were scheduled for
23 hearing.

24 It was my intent that we would attempt to
25 finish this hearing in four days, on Friday. And then

1 Saturday was reserved for any spillover. And I have on
2 this list six witnesses for Saturday, the 10th of June.
3 And I want everybody to know, that I intend to try and
4 finish on Friday. Because I don't want to have an
5 incomplete hearing come Saturday.

6 And so I will compress this list of witnesses
7 and the days that the witnesses will appear and testify.
8 And if I find that we're getting behind, I will hold you
9 over. And we will start early. Because I want to
10 ensure that we finish, and at least attempt to finish by
11 Friday.

12 And if you can keep me apprised of some of
13 these witnesses who may or may not testify as we proceed
14 through the hearing, I would appreciate it. I don't
15 want to hold you over, and then finish on Thursday at
16 noon. It would be great, I guess. But I want everybody
17 to know that I want to finish. And my goal is to finish
18 on Friday.

19 MS. KLAHN: Mr. Director.

20 THE HEARING OFFICER: Yes.

21 MS. KLAHN: Sarah Klahn for the City of
22 Pocatello. On the list that you have, Sophia Sigstedt
23 and Greg Sullivan, the order there is flipped. So
24 Mr. Sullivan will go before Sophia, and after
25 Mr. Barlogi, just an FYI.

1 THE HEARING OFFICER: That would be great.
2 And I appreciate the parties honestly coordinating and
3 figuring out who will be available on which days, so
4 that we can accommodate people as best we can. So I
5 appreciate everybody's efforts. And there may need to
6 be some adjustment because of availability or
7 unavailability.

8 We had to get Jennifer Sukow excused from jury
9 duty by the way, and issue her a subpoena. So that she
10 could then go present it to the folks at the county, so
11 that she could be here.

12 Candice, were you wanting to say something?

13 MS. McHUGH: Yes. I'm sorry. I think there
14 is just a slight delay. And you kind of addressed it.
15 I just wanted to note for the record that McCain's
16 witness, Scott King, and Amalgamated's is Dean Delorey,
17 they are available Friday. So they need to go on
18 Friday. Mr. King might have a little more flexibility,
19 but he's checking his schedule. But Mr. Delorey does
20 not. So regardless, I would ask that they be set for
21 Friday. I expect their testimony to be less than ten
22 minutes. So it would be really quick.

23 THE HEARING OFFICER: Okay. I also notice on
24 the screen that Katie continues to appear. And I'm
25 assuming that means that she is not muted.

1 Candice is now there. But Katie was on the
2 screen earlier. So I would ask whoever Katie is, will
3 you please mute your microphone.

4 And, Sarah Tschohl, if you can control with
5 the Draconian hand, I would appreciate it as well.

6 Mr. Fletcher, you had a comment.

7 MR. FLETCHER: I just wanted to clarify the
8 switch in witness order. Is Greg Sullivan going before
9 Delorey?

10 MS. KLAHN: No. No. Sophia and Greg are
11 switching. That's all.

12 MR. FLETCHER: Okay. Thank you.

13 THE HEARING OFFICER: Okay.

14 MR. THOMPSON: Mr. Director, one point on that
15 list. We do have Justin Temple at some point, probably
16 Friday, not very long, ten minutes. But that will be
17 added.

18 THE HEARING OFFICER: I expect to have some
19 flexibility in this witness schedule. Particularly if
20 I'm trying to compress. So if the parties will just
21 keep me apprised of what's happening, and keep everybody
22 else apprised, then we'll be able to keep to a
23 semi-rigid schedule. Again, I appreciate everybody's
24 efforts.

25 Okay. Are there other matters we need to take

1 up this morning?

2 Let's talk about the order of questioning. So
3 because this is a hearing that a Hearing Officer and the
4 Director initiated, and because at least the
5 Department's witnesses do not have documents that they
6 prepared, and specifically for the hearing, itself.
7 Often the Hearing Officer will ask for a staff memo.

8 We will have then the Department witnesses
9 testify at least as in timing as closely as possible to
10 the beginning of the hearing. Then what I'll do is I'll
11 ask the Surface Water Coalition to question the
12 Department witness shortly after to the extent that
13 there are questions. And then allow the other parties
14 to question the Department witness. And then we'll
15 circle back and allow what I would characterize as
16 redirect based on the questions that are asked.

17 Now, if that's not an order that the parties
18 want to follow, I want to hear about it today.
19 Particularly from the Surface Water Coalition, if you
20 think it compromises your ability to question the
21 witnesses.

22 MR. FLETCHER: Just a comment. Mr. Director,
23 most of the questions are going to be raised by the
24 ground water users. And until they ask their questions,
25 we can try to cover the areas we think they're concerned

1 about it. But it might be more efficient to let them
2 question the witness, and then let us address those
3 issues.

4 THE HEARING OFFICER: And I don't oppose your
5 proposal.

6 MR. FLETCHER: I think that would be more
7 efficient. I mean, obviously, we're not the ones
8 contesting most of the issues in the matter.

9 THE HEARING OFFICER: Any other thoughts?

10 All right. Well, based on your suggestion,
11 Mr. Fletcher, we'll have the Department witness
12 introduced. And some preliminary information brought
13 into the record or offered by the deputy attorney
14 general here today, Pete Wood. And then we'll ask the
15 ground water users and the other parties aligned with
16 them to question the Department witness. And then there
17 will be an opportunity for questioning.

18 And then I don't know how to characterize
19 this, whether it's redirect or recross. It's really not
20 either, I suppose in the examination of the Department
21 witnesses. But the ground water users will have two
22 opportunities. And the Surface Water Coalition will
23 have two opportunities. And then we'll be done.

24 MR. FLETCHER: Thank you.

25 THE HEARING OFFICER: Fair enough?

1 MR. FLETCHER: Yes.

2 THE HEARING OFFICER: And then I would expect
3 with the other witnesses, that we follow a more
4 traditional method of examination. Where the witness
5 testifies, and then there is an opportunity for
6 cross-examination, and redirect, and recross. So it's
7 only with the Department witnesses that I think there is
8 an anomalous presentation of testimony.

9 Okay. Other matters we need to talk about?

10 Pete, any matters?

11 MR. WOOD: Not that I can think of.

12 THE HEARING OFFICER: Okay. I'm ready for the
13 first witness. Again, let me remind everybody, as you
14 examine, I want you to come forward. Assume either a
15 seat at the table or standing at the lectern, and then
16 you can examine from either place. The witness will be
17 here, seated to my right.

18 TJ?

19 MR. BUDGE: Yes. Director, there is one more
20 pretrial matter I forgot about. I think counsel did as
21 well. But counsel for the parties did stipulate that
22 the expert witnesses would be qualified as such without
23 needing to go through, you know, their background, and
24 demonstrate their capabilities to testify as experts.

25 THE HEARING OFFICER: Yes. Thanks for raising

1 and identifying the stipulation. So I will accept the
2 stipulation. I'm well acquainted I think with most of
3 the experts, if not all of the experts, who will testify
4 today. And I appreciate the pre-hearing stipulation
5 that will encourage efficiency.

6 MR. FLETCHER: Yes.

7 THE HEARING OFFICER: Mr. Fletcher.

8 MR. FLETCHER: On that issue, Mr. Director, we
9 stipulated to a designated list of expert witnesses. We
10 did not stipulate to a Mr. Olson. And I'm not sure we
11 stipulated to Jaxon for everything as an expert on
12 everything he put in his report, Jaxon Higgs. But the
13 rest of the experts I can think of, I believe we can
14 stipulate to their admission as experts. And the ground
15 water users clarified that to be to the matters
16 contained in their reports.

17 THE HEARING OFFICER: Okay. Clarification
18 accepted, TJ.

19 MR. BUDGE: Yes.

20 THE HEARING OFFICER: All right. Anything
21 else?

22 Jennifer Sukow, if you'll come forward,
23 please.

24 JENNIFER SUKOW,
25 first duly sworn to tell the truth relating to said

1 cause, testified as follows:

2 THE HEARING OFFICER: Thank you. Please be
3 seated.

4 Mr. Wood, you may examine Ms. Sukow.

5 DIRECT EXAMINATION

6 QUESTIONS BY MR. WOOD:

7 Q. Hello, Ms. Sukow. Can you please state and
8 spell your name for the record.

9 A. Jennifer Sukow, J-e-n-n-i-f-e-r, S-u-k-o-w.

10 Q. And what is your educational background?

11 A. I have a bachelor's degree in environmental
12 geology and technology from the University of North
13 Dakota, and a master's of science in civil engineering
14 from Utah State University.

15 Q. And you are a licensed professional engineer
16 and geologist in Idaho; is that correct?

17 A. Yes.

18 Q. And you were currently employed at the Idaho
19 Department of Water Resources?

20 A. Yes.

21 Q. And how long have you worked for the
22 Department?

23 A. About 15 years.

24 Q. And you are currently a technical engineer for
25 the hydrology section?

1 A. Yes.

2 Q. And how long have you been in that position?

3 A. About 13 years.

4 Q. I would like to turn to the Fifth Methodology
5 Order. Are you familiar with that document?

6 A. Yes.

7 Q. And some of the data in the Fifth Methodology
8 Order you know a lot about; is that right?

9 A. Some of it, yes.

10 Q. And you played a role in developing some of
11 that information?

12 A. Some of the findings of fact, yes.

13 Q. And that is why the Department has selected
14 you to be a witness today; is that correct?

15 A. That's my understanding.

16 Q. And you were aware that on May 5th, 2023, the
17 Director issued a notice advising the parties of two
18 topic areas that you might testify today about?

19 A. Yes.

20 Q. And those two topic areas are the following:
21 The first is steady state modeling versus transient
22 state modeling, simulations for the ESPA. And the
23 second is calculations of curtailment priority dates for
24 the Surface Water Coalition's delivery call. Does that
25 sound correct?

1 A. Yes.

2 Q. And do you have any concerns that you're
3 unqualified to discuss those topics here today?

4 A. No.

5 MR. WOOD: The Department has no further
6 questions at this time.

7 THE HEARING OFFICER: Thank you, Mr. Wood.

8 All right. Ground water users, is there an
9 order of examination that you prefer?

10 MS. MCHUGH: Mr. Director, this is Candice. I
11 think I'm slated to go first.

12 THE HEARING OFFICER: Okay. Ms. McHugh.

13 MS. MCHUGH: Just for some efficiency, could I
14 have the witness handed the Coalition of Cities'
15 exhibits No. 300, the binder for that?

16 MR. WOOD: Was it 300 through 313?

17 MS. MCHUGH: 300 and then through 318.

18 THE HEARING OFFICER: The witness has the
19 documents in front of her.

20 MS. MCHUGH: Okay. Thank you.

21 CROSS-EXAMINATION

22 QUESTIONS BY MS. MCHUGH:

23 Q. Good morning, Jennifer. Candice McHugh on
24 behalf of the Coalition of Cities and McCain Foods. If
25 you could look at the binder, and grab Exhibit 300.

1 (Exhibit 300 marked.)

2 Q. (BY MS. MCHUGH) If you could identify Exhibit
3 300?

4 MR. THOMPSON: Director, this is the --

5 THE HEARING OFFICER: Just a moment, Candice.

6 MS. MCHUGH: Okay.

7 MR. THOMPSON: This is our first overlap. I
8 think this is IGWA's common 918. And if you just want
9 to use that once, or admit it twice in the record. I'm
10 confused on what we're going to do?

11 THE HEARING OFFICER: So should we refer to
12 this as 918?

13 MS. MCHUGH: Okay. We can --

14 THE HEARING OFFICER: And one of the concerns
15 I have is that the exhibits, themselves, and the
16 documents, themselves, don't bear those numbers; do
17 they? It's only --

18 MS. PATTERSON: Not the 900s.

19 MR. THOMPSON: The 900s do. They are all
20 Bates stamped.

21 MS. KLAHN: We could substitute.

22 MS. MCHUGH: The other option, not to belabor
23 the record, but if you give her Exhibit NO. 918, 919,
24 and 920. And if someone could tell me what 900 series
25 the April 2022 forecast supply order is, I could also

1 use that 900 number. But I just don't -- from the
2 descriptions, from IGWA's descriptions, I can't tell
3 what 900 number that is.

4 MR. BUDGE: So Candice 918 is the Fifth
5 Methodology Order.

6 MS. McHUGH: Uh-huh.

7 MR. BUDGE: And 919 is the As-Applied Order.

8 MS. McHUGH: Right. I'm looking for -- I know
9 that. I need the April 2022 As-Applied Order number in
10 the 900 series.

11 THE HEARING OFFICER: All right. Let's go off
12 the record.

13 (Off the record.)

14 THE HEARING OFFICER: Are we ready to go back
15 on? We're recording again. Thank you, Colleen.

16 All right. Candice, if you will refer to the
17 exhibits you want the witness to review. And we're
18 expecting exhibits in the 300 series.

19 MS. McHUGH: Great. Thank you.

20 Q. (BY MS. McHUGH) Good morning, Jennifer.
21 We'll start again. In front of you, you should have
22 Exhibit No. 300. Can you identify that document?

23 A. It's the "Fifth Amended Final Order Regarding
24 Methodology for Determining Material Injury to
25 Reasonable In-Season Demand and Reasonable Carryover."

1 (Exhibit 301 marked.)

2 Q. (BY MS. MCHUGH) Okay. And if you could just
3 flip in that binder to Exhibit 301, and identify that
4 exhibit?

5 A. It's the "Final Order Regarding April 2023
6 Forecast Supply."

7 Q. And can you just provide a brief explanation
8 as to what your role was in creating Exhibits 300 and
9 Exhibit 301?

10 A. In Exhibit 300, I assisted with writing
11 findings of fact relating to the ESPA ground water flow
12 model and calculation of a curtailment priority date for
13 the delivery call. And in Exhibit 301, I did the
14 calculations of the curtailment priority date and the
15 proportionate shares for A & B and IGWA. And I inserted
16 that information in the draft of the order.

17 Q. Okay. And so if I understand you correctly,
18 once the Director determined that there was shortage to
19 Twin Falls Canal Company, you determined that December
20 31st, 1953 would be the appropriate curtailment date; is
21 that correct?

22 A. That's correct.

23 Q. And the expectation was if water users junior
24 to the December 31st, 1953 were curtailed, you would
25 expect approximately 75,000 acre-feet of water would

1 accrue to Twin Falls Canal Company; is that correct?

2 A. We would predict with the model that
3 approximately 75,000 acre-feet would accrue to the near
4 Blackfoot to Minidoka reach between May 1 and September
5 30th of this irrigation season.

6 Q. Okay. And Twin Falls Canal Company's water
7 supply is supplied by that reach of the river; is that
8 true?

9 A. Yes, they have a natural flow that is diverted
10 from that reach of the river.

11 Q. Okay. And in determining the curtailment
12 date, and the amount of water that would accrue to the
13 Twin Falls Canal Company, you used the model in a
14 transient mode; is that true?

15 A. Yes, I did a transient simulation as described
16 in the Fifth Methodology Order.

17 Q. Okay. And if you could look at Exhibit 300 on
18 page 2. And do you see the paragraph there that says
19 that the Department has had additional, and many years
20 to understand the impact of applying steady state
21 modeling? Do you see that paragraph there?

22 A. Yes.

23 Q. And you didn't write this paragraph; did you?

24 A. No, I didn't write it. I think I was asked to
25 look at it, and I edited a couple words in one of the

1 sentences just to make it technically correct.

2 Q. Okay. When you first started with the
3 Department roughly 13 years ago, you knew the difference
4 in impacts when you started with the Department between
5 the output from a steady state model and a transient
6 state model; is that correct?

7 A. Yes.

8 Q. And your predecessor Allan Wylie also knew the
9 difference in model output between a steady state output
10 and a transient model output; correct?

11 A. Yes.

12 Q. And changing from a steady state model to a
13 transient model to predict curtailment date, wasn't a
14 decision in the Fifth Methodology Order, Exhibit 300,
15 based on technical information; was it?

16 A. Well, I was asked to prepare technical
17 information about the change from steady state to
18 transient, and I did present that technical information
19 to the technical working group and the Director.

20 Q. I guess my question is, the change from going
21 from a steady state model that had happened for the
22 prior at least 13 years since you've been with the
23 Department, to this year to the move to a transient
24 model, the impetus for that was not a technical
25 decision; correct?

1 A. It was the Director's decision. I do not know
2 what the impetus was.

3 Q. Do you believe that it was a technical
4 decision?

5 A. I don't know.

6 Q. Do you recall the deposition that I took of
7 you a couple of weeks ago, Jennifer?

8 A. Yes.

9 Q. And in that deposition I asked what the
10 impetus was for changing from a steady state model to a
11 transient model in 2023. Do you recall that?

12 A. Not specifically.

13 Q. Okay. Well, we'll come back to that in a
14 minute. Were you told why the administrative decision
15 to change from a steady state model to a transient model
16 was implemented in 2023?

17 A. My understanding is that it is because of
18 direction that the -- direction from the court that the
19 water needs to be provided during the irrigation season
20 at the time and place that it's needed.

21 Q. And who told you that it was the court that
22 directed that change?

23 A. I believe Gary Spackman said that.

24 Q. When we first were at the Department, you
25 understood that the ESPAM model was a transient model;

1 is that true?

2 A. The ESPAM model can run simulations in steady
3 state or in transient.

4 Q. Okay. And the ESPAM model has always been
5 able to run a transient output; correct?

6 A. Yes, previous versions of ESPAM could also run
7 a transient simulation.

8 Q. And the current version of the ESPAM model, do
9 you recall when it was implemented or created?

10 A. I'm sorry. Can you repeat the question?

11 Q. Yep. The current version of the ESPAM model
12 it's -- maybe I'll do it this way, is 2.2; is that true?

13 A. Yes.

14 Q. And ESPAM2.2 when did it first exist?

15 A. It was finalized in May of 2021.

16 Q. The current version of ESPAM2 is finalized in
17 May of 2021. And the prior version was ESPAM2.1;
18 correct?

19 A. Yes.

20 Q. And when was ESPAM2.1 finalized?

21 A. It was either the end of 2012 or early in
22 2013.

23 Q. Okay. So roughly in 2013 when ESPAM2.1 was
24 updated from the prior version, it was calibrated using
25 monthly stress periods in half-month time steps; is that

1 true?

2 A. Yes.

3 Q. And the current version of ESPAM2.2 also uses
4 monthly stress periods in half-month time steps;
5 correct?

6 A. Yes.

7 Q. So prior to 2023, the model was capable of
8 predicting an in-season amount of water that could be
9 expected in the near Blackfoot to Minidoka reach; is
10 that true?

11 A. Yes.

12 Q. Because the current version has been able to
13 do that since roughly 2013; correct?

14 A. Well, I wouldn't say the current version, but
15 the previous version, 2.1 could, yes.

16 Q. Okay. But there is nothing that changed
17 between 2.1 and the 2.2 version that makes the monthly
18 stress period and the half-month time step different
19 from a transient model standpoint?

20 A. The time discretization did not change between
21 ESPAM Version 2.1 and ESPAM Version 2.2.

22 Q. So effectively ESPAM2.2 has always been a
23 transient model?

24 A. I'm sorry. Repeat that?

25 Q. So ESPAM 2 and 2.1 -- we'll just say it this

1 way. So ESPAM2.1 and ESPAM2.2 has always been a
2 transient model; correct?

3 A. They were both calibrated as transient models,
4 yes.

5 Q. Okay. In 2023, you understood the difference
6 between the model output for transient versus steady
7 state output; correct?

8 A. Yes.

9 Q. And you also understood in 2013, ten years
10 prior, the difference between the model output for
11 transient versus steady state output; correct?

12 A. Yes.

13 Q. And since 2013, there were curtailment orders
14 in the surface water delivery call; correct?

15 A. Yes.

16 Q. Yet they all used the steady state output;
17 isn't that true?

18 A. Yes, a steady state simulation was used.

19 Q. Okay. Even though ESPAM2.1 starting in 2013
20 through 2021 had the monthly stress periods and
21 half-month time steps capable of being ran in the
22 transient mode?

23 A. Yes.

24 (Exhibit 318 marked.)

25 Q. (BY MS. MCHUGH) Could I have you look at

1 Exhibit 318. Jennifer, can you identify this exhibit?

2 A. It's a presentation titled "Surface Water
3 Coalition Methodology - calculation of priority dates
4 for curtailment of ground water users."

5 Q. Is it a PowerPoint presentation that you
6 prepared?

7 A. Yes.

8 Q. And the date being November 28, 2022?

9 A. Yes.

10 Q. And did you provide this PowerPoint
11 presentation to the Surface Water Coalition technical
12 working group?

13 A. Yes.

14 Q. Jennifer, is the exhibit in front of you, does
15 it have page numbers on it or slide numbers?

16 A. No.

17 Q. Okay. And so for ease of examination, I'm
18 going to have you like have to thumb through, and I will
19 say like Slide 6, which would essentially be the sixth
20 page of that exhibit. Does that make sense?

21 A. Yes.

22 Q. Okay. And if you would just look at that
23 Exhibit 318, is it complete? Is it completely your
24 PowerPoint presentation, are all the slides in that?

25 A. I don't know. I don't have every page

1 memorized, so I wouldn't be able to just be able to look
2 at it and know what was missing.

3 Q. Fair enough. Okay. Can you tell me how many
4 pages it is, just so I'm making sure we have the same
5 exhibit?

6 A. I have 22 pages.

7 Q. Okay. And mine has 22 pages, so we're good.
8 Okay. Before we get into the actual pages there, just a
9 little bit of background. Are you aware that there has
10 been a moratorium on new wells without mitigation, so
11 new wells on the Eastern Snake Plain Aquifer since the
12 early 1990s?

13 A. Yes.

14 Q. So almost all the wells that withdraw water
15 from the Eastern Snake Plain Aquifer have been pumping
16 for at least 30 years, and some much longer than that;
17 correct?

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

19 Q. Okay. And if you could look at Slide No. 6 of
20 your Exhibit 318. And Slide No. 6 is a graph that talks
21 about, that shows the steady state conditions. Is that
22 what you see there?

23 A. It's the time to reach the steady state
24 response.

25 Q. Okay. And isn't it true that between 90

1 percent and 99 percent of the impacts of all ESPA
2 pumping on the Snake River flows have been realized?

3 A. Yes.

4 Q. And that's what this Slide No. 6 of Exhibit
5 318 shows that; correct?

6 A. Yes, it states that in the bullet.

7 MS. MCHUGH: Okay. At this point, I guess I
8 would offer Exhibit 318 as an exhibit, or an offer into
9 the record.

10 THE HEARING OFFICER: Any objections?

11 Hearing none, the document marked as Exhibit
12 318 is received into evidence.

13 (Exhibit 318 received into evidence.)

14 Q. (BY MS. MCHUGH) Jennifer, continuing on with
15 Exhibit 318, if you could look at Slide No. 13.

16 THE HEARING OFFICER: Ms. McHugh, it might be
17 helpful rather than just giving us numbers, if somehow
18 we can identify a title on the page, since the pages are
19 not numbered.

20 MS. MCHUGH: Yes, fair enough.

21 Q. (BY MS. MCHUGH) So on Slide 13, can you read
22 the title of that page?

23 A. "Comparison of priority dates calculated for
24 April demand shortfall forecasts for May 1 curtailment."

25 Q. And if you recall, and if you need to look

1 back at Exhibit 301, which is the 2023 As-Applied Order.
2 Do you recall the amount of water that was forecasted to
3 be short in the 2022 season?

4 A. Yes.

5 Q. And that number is roughly 75,000 acre-feet;
6 is that right?

7 A. Yeah, 75,200 acre-feet.

8 Q. Okay. And if you look at page No. 13, it
9 says, "Comparison of priority dates calculated." If you
10 look at that graph, based on this slide, curtailment of
11 wells junior to sometime in the mid-1980s would produce
12 roughly 75,200 acre-feet to the near Blackfoot to
13 Minidoka reach of the Snake River in steady state; is
14 that right?

15 A. Can you --

16 Q. If you look at the yellow line?

17 A. So, yeah, if you are looking at the yellow
18 line, a steady state curtailment, which would be a
19 continuous curtailment to the same date every year with
20 a priority date in the mid-1980s would produce
21 approximately 75,000 acre-feet.

22 Q. So in other words, would you agree that if
23 wells junior to the mid-1980s had never started pumping,
24 there would be an additional 75,200 acre-feet in the
25 river in 2023?

1 A. Assuming all other aquifer and recharge and
2 discharge occurred the same over those years, then, yes,
3 there should be approximately that additional volume in
4 the reach, in the river reach.

5 Q. And as a result, without the pumping of those
6 wells junior to the mid-1980s, there would be no
7 forecast shortage for the Surface Water Coalition
8 members in 2023; correct?

9 A. Yes.

10 Q. Okay. I'm just going to switch gears for a
11 brief moment. In roughly August of 2022, the Director
12 notified the parties that he was convening a technical
13 working group regarding the Surface Water Coalition
14 delivery call; is that your understanding?

15 A. Yes.

16 Q. And how were you notified or told that there
17 was going to be this technical working group?

18 A. I was told by Matt Anders.

19 Q. Okay. And did you know which people were told
20 or asked to, or invited to be part of the technical
21 working group?

22 A. No.

23 Q. Who made the decision on who would be invited
24 to participate in the technical working group?

25 A. I don't know.

1 Q. And when did you first become aware of who was
2 invited to participate in the technical working group?

3 A. I don't know that I was ever aware of who was
4 invited. My only knowledge is of who was in attendance
5 when I gave the presentation. And I doubt that I even
6 recall who all was in attendance. But I am aware of
7 some of the attendees.

8 Q. Okay. And when you gave your presentation,
9 which I think you are referring to Exhibit 318, the
10 PowerPoint. Did you do that via Zoom, or some other
11 remote meeting format?

12 A. I gave the presentation from our conference
13 rooms. But there were some attendees in person and some
14 that were participating remotely.

15 Q. Okay. And then did you provide the PowerPoint
16 presentation to the technical working group via the
17 Department's website; is that how people got the
18 information?

19 A. I presented it in the meeting, and I
20 believe -- and I gave a PDF version to Matt Anders, that
21 I believe he sent out to the technical working group.
22 But I did not personally send it out.

23 Q. Okay. Coming back to Slide 13 in Exhibit 318.
24 This year the Director predicted that approximately
25 75,200 acre-feet of shortfall was going to Twin Falls

1 Canal Company. If you look at your graph there on Slide
2 13 of Exhibit 318, it shows the difference in the number
3 of acres that would be curtailed using a transient model
4 versus a steady state model; correct?

5 A. Yes, you can determine that information by
6 comparing the different points on this graph.

7 Q. Okay. And then I think in your presentation
8 you also -- well, let's just stick with this slide
9 first. If you look at the graph there, it shows that in
10 order to get 75,000 acre-feet to Twin Falls Canal
11 Company using a steady state model, the number of acres
12 that would be curtailed is approximately 75,000 acres.
13 Do you see that, or would you agree with that?

14 A. If you curtailed to the mid-1980s, the acres
15 curtailed would be somewhere in that ballpark, yes.

16 Q. Okay. And that would show roughly 75,000
17 acre-feet to the near Blackfoot to Minidoka reach;
18 correct?

19 A. Well, it would show that that would get
20 there -- that that would be the long-term annual average
21 if that curtailment occurred continuously every year.

22 Q. Okay. And if you also look at that graph, in
23 order to get 75,000 acre-feet of water to Twin Falls
24 Canal Company during this season in a transient state
25 model, it would require the curtailment of approximately

1 700,000 acres; is that correct?

2 A. That's correct.

3 Q. So nearly ten times as many acres; correct?

4 A. Roughly, yes.

5 Q. Okay. Were there any discussions on whether
6 that was a reasonable outcome?

7 A. I think that was discussed, yes.

8 Q. And was it discussed with you?

9 A. To some extent, yes.

10 Q. And the conclusion was what?

11 A. The conclusion I think is evident in the
12 Director's order was that the conclusion was that the
13 requirement is to get the water to the reach during this
14 irrigation season and that that was the deciding factor.

15 Q. Okay. So you agree that in order to get
16 75,000 acre-feet of water to Twin Falls Canal Company
17 during this irrigation season needing to curtail 700,000
18 acres is a reasonable outcome?

19 THE HEARING OFFICER: Okay. Ms. McHugh, I
20 will insert and just state that this line of questioning
21 is not one that Ms. Sukow is qualified to answer.

22 And I'll instruct the witness not to answer
23 the question. That was not her assignment in developing
24 the data and producing the report that she produced.

25 MS. McHUGH: Okay.

1 (Exhibit 305 marked.)

2 Q. (BY MS. MCHUGH) Ms. Sukow, could I have you
3 look at Exhibit 305. And can you identify Exhibit 305
4 for the record?

5 A. "Final Order Regarding April 2022 Forecast
6 Supply."

7 Q. And did you assist the Director in preparing
8 any portion of the April '22 forecast supply?

9 A. I calculated a curtailment priority date using
10 the ESPA ground water flow model, and I calculated, I
11 believe in this one, yes, a proportionate share for
12 A & B Irrigation District.

13 Q. Okay. And if I'm correct, the Director
14 predicted that Twin Falls Canal Company would be short
15 approximately 162,000 acre-feet in that order; is that
16 correct?

17 A. It says 162,600 acre-feet.

18 Q. Okay. And if you look at Exhibit 318, back to
19 Slide No. 13. How many acres would be curtailed in a
20 steady state model run to supply 162,000 acre-feet of
21 shortage?

22 A. It's somewhere around 150,000 to 170,000 acres
23 perhaps.

24 Q. Okay. And if you were to run that same number
25 with transient model output, how many acres would be

1 curtailed, approximately?

2 A. Approximately 940,000 acres.

3 Q. Okay. And if you could turn to Slide No. 15.
4 If I'm looking at Slide No. 15 -- do you have that
5 there?

6 A. Yes.

7 Q. And could you give me the title of that slide?

8 A. "Predicted response to May 1 curtailment of
9 water rights junior to October 11, 1900."

10 Q. And this slide shows that if you curtailed
11 back to a 1900 priority date, the April to September
12 accrual to the reach that supplies Twin Falls Canal
13 Company would be approximately 97,700 acre-feet; is that
14 correct?

15 A. Yes.

16 Q. Isn't it true that if you curtail all the
17 ground water users starting May 1st of any given year,
18 that the maximum amount of water that accrued that
19 season would be 97,700 acre-feet to that reach?

20 A. That is the predicted volume to accrue from
21 curtailing all of the ground water users junior to
22 October 11th, 1900 within the area of common ground
23 water supply.

24 MS. McHUGH: Okay. I don't have any further
25 questions. Thank you, Jennifer.

1 THE HEARING OFFICER: Okay. Thank you,
2 Ms. McHugh.

3 MS. McHUGH: I would just ask that Exhibits
4 300, 301, and 305 be admitted. I realize they are the
5 Director's orders in this case, and then the order from
6 last year. But I think for ease of examining it is
7 helpful to have them in as exhibits.

8 THE HEARING OFFICER: Any objection to the
9 admission of the documents marked as Exhibit 301, 302,
10 and 305?

11 MR. FLETCHER: No objections.

12 THE HEARING OFFICER: Hearing no objections,
13 documents numbered 301, 302, 305 are received into
14 evidence.

15 MR. BRICKER: I just want to clarify.

16 THE HEARING OFFICER: Yes.

17 MR. BRICKER: Was it 300 to 301, or 301 and
18 302?

19 THE HEARING OFFICER: I'm sorry. I'm assuming
20 that it's 300, 301 --

21 MS. McHUGH: 300, 301, and 305.

22 THE HEARING OFFICER: And 305. And I
23 misstated. Thank you.

24 (Exhibits 300, 301, 305 received into
25 evidence.)

1 THE HEARING OFFICER: Okay. Anything further,
2 Ms. McHugh?

3 MS. McHUGH: Nothing further. Thank you.

4 THE HEARING OFFICER: Okay. Thank you.

5 It's 10:30. We've been engaged for an
6 hour-and-a-half. Do you the parties want a break,
7 should we continue with another set of questions?
8 Anybody?

9 Let's forge ahead. Who's next.

10 MS. KLAHN: I have a couple of questions. I
11 was trying to send them to Candice, but it didn't work.

12 THE HEARING OFFICER: Ms. Klahn.

13 CROSS-EXAMINATION

14 QUESTIONS BY MS. KLAHN:

15 Q. Good morning, Jennifer. My name is Sarah
16 Klahn. I represent the City of Pocatello. I wanted to
17 ask you about some things related to the modeling
18 questions that Candice was asking you. And I want to
19 back up a step and ask you a little bit about model
20 calibration. Is that something you are involved with?

21 A. Yes.

22 Q. Okay. In the framework of model calibration,
23 is one of the inputs you use to compile the return flows
24 associated with Twin Falls Canal Company?

25 A. Indirectly they are used to calculate. Their

1 return flows are used in the calculation of the Kimberly
2 to King Hill reach gain, which is used in the
3 calibration.

4 Q. Okay. And is that because the calibration
5 involves understanding reach gains that come from ESPA
6 discharges versus reach gains that accrue from return
7 flows from the south side, where Twin Falls is located?

8 A. Yes.

9 Q. Okay. So when you are compiling these, you
10 would subtract them from the reach gains coming from the
11 north side in order to get the correct relationship; is
12 that true?

13 A. No, that's not correct.

14 Q. Okay. Can you tell me what is correct?

15 A. So the reach gain from the north side the
16 target for that is calculated by taking the inflow gage
17 at Kimberly, the outflow -- and so the river flow at
18 Kimberly, the river flow at King Hill going out of that
19 reach. And then adding or deducting adjustments for all
20 of the other surface flows that occur in between there,
21 and the inflow from the south side.

22 Q. Okay.

23 A. So it's not an adjustment to the ESPA
24 discharge. The ESPA discharge is the reach gain. It's
25 just used to calculate how much of what's in the river

1 in that reach, you know, there is other components in
2 the river flows at that reach. So we have to adjust to
3 them, adjust those out to know what our target is for
4 the ESPA discharge.

5 Q. Okay. Thank you for that explanation. Can
6 you confirm that the total amount of return flows
7 associated with Twin Falls Canal Company that you're
8 using in that manipulation you just described, is
9 between about 300,000 and 400,000 during the irrigation
10 season?

11 A. I don't recall. I would have to look at my
12 spreadsheet to -- I don't have that number, that volume
13 memorized.

14 Q. Have you evaluated any long-term trends in
15 Twin Falls return flows as part of your calibration
16 efforts for the model?

17 A. Oh, we don't need to do that for the model,
18 because we're looking at the past. So we just look at
19 the measured data that occurred and subtract that off
20 when we're calculating the reach gain.

21 Q. But in the spreadsheet you are describing, it
22 would include sources of water from the Twin Falls
23 system that are contributing the return flows?

24 A. Well, it includes the measurements made at the
25 locations where those returns occur.

1 Q. Is seasonality any part of the evaluation that
2 you do when you are doing that?

3 A. Well, we use monthly data, so the seasonality
4 is inherent in those monthly averages.

5 MS. KLAHN: Okay. Thank you. That's all I
6 have.

7 THE HEARING OFFICER: Okay. Further
8 questions? I thought I saw a hand up.

9 Mr. Budge.

10 CROSS-EXAMINATION

11 QUESTIONS BY MR. BUDGE:

12 Q. Thank you, Ms. Sukow. I'm TJ Budge, on behalf
13 of the Idaho Ground Water Appropriators. I will try not
14 to duplicate the questions you got from Ms. McHugh.

15 Jennifer, you are the lead ground water
16 modeler with the Department?

17 A. That's not officially my title, but...

18 Q. Did you provide all of the modeling work that
19 was utilized in the Fifth Methodology Order?

20 A. I provided the modeling work that was
21 presented to the technical working group and the
22 Director that was used I think as a basis for that, yes.

23 Q. Was there other modeling work that was created
24 in the Department that you did not provide to the
25 technical working group?

1 A. No.

2 Q. Okay. And if the Director wanted to know any
3 modeling issues related to the Fifth Methodology Order,
4 you're the one who would have produced that information?

5 A. To my knowledge, yes.

6 Q. Okay. In terms of the initiation of the
7 review of the Fourth Methodology Order, that decision
8 came from the Director; correct?

9 A. I'm sorry. Repeat the question.

10 Q. The decision to review the Fourth Methodology
11 Order, that came from the Director?

12 A. That's my understanding.

13 Q. You didn't tell the Director that there had
14 been some change in the modeling data that necessitated
15 a change to the methodology order?

16 A. No.

17 Q. And the modeling work that you did on the
18 Fourth Methodology Order, that came at the direction of
19 the Director or Matt Anders?

20 A. I was directed by Matt Anders to do that, yes.

21 Q. Okay. So if Matt told you to do some type of
22 modeling, then you performed that at his direction?

23 A. Yes, and he was the one who communicated to me
24 what the Director wanted me to model.

25 Q. Understood. And if Matt told you not to do

1 some type of modeling, then you would not have done
2 that?

3 A. He told me what modeling -- or told me what
4 questions they wanted to address, and I did the
5 modeling. I wasn't directed not to do any modeling.

6 Q. Got you. You did not go outside the scope of
7 the instructions that Matt had given you?

8 A. No.

9 (Exhibit 914 marked.)

10 Q. (BY MR. BUDGE) Okay. If you could turn to
11 Exhibit 914.

12 THE HEARING OFFICER: We should have two
13 common exhibit binders. 914, Mr. Budge?

14 MR. BUDGE: Yes.

15 Q. (BY MR. BUDGE) Jennifer, do you recognize
16 that document?

17 A. Yes.

18 Q. Could you read the title for the record?

19 A. "Comments on behalf" -- oh, I might be
20 on -- what did you say?

21 Q. 914.

22 A. Okay. Never mind. "Comments on Behalf of the
23 Coalition of Cities and the City of Pocatello on the
24 Idaho Department of Resources Summary of Recommended
25 Technical Revisions to the Fourth Amended Final Order

1 Regarding Methodology for Determining Material Injury to
2 Reasonable In-Season Demand and Reasonable Carryover for
3 the Surface Water Coalition," by Kara Ferguson and Matt
4 Anders, on December 23, 2022.

5 MR. BUDGE: Okay. Director, could we go off
6 the record for a moment?

7 THE HEARING OFFICER: Yes.

8 (Off the record.)

9 MR. BUDGE: Back on the record.

10 Q. (BY MR. BUDGE) Jennifer, before we went off
11 the record, you had read the title of what I think is
12 Exhibit 915; is that correct?

13 A. That's correct.

14 Q. Why don't you go ahead and read the title of
15 914?

16 A. "Summary of Recommended Technical Revisions to
17 the Fourth Amended Final Order Regarding Methodology for
18 Determining Material Injury to Reasonable In-Season
19 Demand and Reasonable Carryover for the Surface Water
20 Coalition."

21 Q. Do you recognize that document?

22 A. Yes.

23 Q. Is this a document the Department staff
24 prepared in connection with its work on the Fifth
25 Methodology Order?

1 A. It was prepared by Kara Ferguson and Matt
2 Anders.

3 Q. And you did not participate in drafting that
4 document?

5 A. I did not draft or edit the document.

6 Q. Okay. If you could turn to Exhibit 318?
7 Jennifer, this is the presentation that you gave to the
8 technical working group; is that right?

9 A. That's correct.

10 Q. And my understanding is that this
11 presentation, along with the underlying data that was
12 posted to the Department's website, that consists of all
13 of the modeling work you did related to development of
14 the Fifth Methodology Order?

15 A. Yes.

16 Q. Okay. You didn't do any modeling work after
17 that presentation was given, but prior to the issuance
18 of the Fifth Methodology Order?

19 A. Not for this issue, no.

20 Q. What issues did you do modeling work?

21 A. Well, I'm doing modeling work all the time.
22 That was a pretty vague question.

23 Q. Not related to the Fifth Methodology Order?

24 A. Not related to the Fifth Methodology Order.

25 Q. Thank you, I appreciate that. I'm going to

1 shift gears just briefly.

2 During your deposition we discussed an
3 irrigated lands dataset that's used in the ESPA model;
4 correct?

5 A. Yes, I believe we did.

6 Q. And can you explain what that dataset consists
7 of?

8 A. The irrigated lands datasets that we're
9 currently using in model calibration are developed by
10 IDWR's GIS staff. And they delineate what -- they
11 delineate lands as being either irrigated, or
12 semi-irrigated or non-irrigated by using a variety of
13 data sources.

14 Q. What are the data sources they utilize to make
15 those designations?

16 A. Some of the data sources are the CDL common
17 land unit polygons. They use Landsat photography. They
18 use aerial photography. They use, I should say, Landsat
19 images. I believe they sometimes refer to the metric ET
20 images. I don't do that work myself. So there may be
21 other data sources that I'm not aware of that they look
22 at.

23 Q. Okay. And that dataset identifies for each
24 irrigated field, whether it's ground water irrigated or
25 whether it's irrigated or non-irrigated?

1 A. Yes, they have three classifications;
2 irrigated, non-irrigated, or semi-irrigated, which means
3 part of it might be irrigated and part of it not. There
4 are areas where typically there are developed areas.
5 You might have a subdivision with houses and lawns and
6 roads. And it's too time consuming an effort to
7 delineate each of those little polygons. So they lump
8 them altogether.

9 Q. How is this dataset used in the aquifer model?

10 A. It is used to calculate aquifer recharge and
11 discharge in conjunction with ET data and precipitation
12 data. So it's used to calculate the irrigation demand.

13 Q. Could that dataset be used within a particular
14 geographic area just to identify the total number of
15 irrigated acres?

16 A. Yes.

17 Q. And is that the best dataset available for use
18 in the model for the purpose for which it's used?

19 A. That is the best dataset we have for model
20 calibration, yes.

21 Q. Okay. Let me ask you about another component
22 of the model that we discussed during your deposition,
23 which you referred to as the ground water fraction.
24 Could you describe what that term means?

25 A. So the ground water source fraction is so

1 some -- you know, some of the irrigated lands have only
2 surface water supply. Some have only ground water
3 supply. But some have both, and we call that mixed
4 source. And within that mixed source, we need to
5 estimate what fraction of that is supplied by surface
6 water, and what fraction is supplied by ground water.

7 Q. And how is that dataset created?

8 A. The original dataset and the -- I guess I
9 should clarify that dataset also includes zeros and ones
10 for things that are entirely supplied by surface water
11 ask ground water. That dataset was initially produced
12 by IWRRRI for a previous version of ESPAM. So I don't
13 have direct knowledge of how they produced it.

14 Q. Okay. And how is that dataset used in ESPAM?

15 A. It is used to -- the irrigation demand that we
16 calculate from the irrigated lands ET and precipitation,
17 it is used to assign that to either surface water
18 diversions or ground water pumping. So it's used to
19 estimate, you know, which source of supply provides
20 that.

21 Q. Okay. And is that the best dataset available
22 to you for use in the model for distinguishing between
23 land that's irrigated with surface water, ground water,
24 or a combination?

25 A. It is the best dataset we have, yeah.

1 Q. Okay. I want to just ask a few follow-up
2 questions about the change from a steady state to
3 transient state application of the model in this case
4 just to make sure I understand.

5 The model was capable of being used in a
6 transient state at the time the Fourth Methodology Order
7 was issued?

8 A. Yes.

9 Q. Could the model also be run at a transient
10 state when the Third Methodology Order was issued?

11 A. Yes.

12 Q. How about the Second Methodology Order?

13 A. I think you may be getting beyond what -- I
14 don't know the dates of those orders. If there was a
15 version of ESPAM available at those dates, then it was
16 capable of running the transient simulation.

17 Q. Okay. So if ESPAM was utilized, then it was
18 capable of being run in a transient state?

19 A. Yes.

20 Q. Okay. So the Director's decision to change
21 from a steady state to transient state was not based on
22 a change in model capabilities; correct?

23 A. The model capabilities with respect to being
24 able to run a transient simulation did not change.

25 Q. Okay. So it would have been a policy decision

1 of the Director?

2 A. Yes.

3 Q. Let me just ask a few questions about the
4 presentation you gave to the technical working group. I
5 believe you have that in front of you. It's Exhibit
6 318. If you'll please turn to page 20 of that exhibit.
7 And this slide is labeled "Comparison of priority dates
8 calculated using transient and steady state analyses."
9 Do you have the that in front of you, Jennifer?

10 A. Yes.

11 Q. As I understand this slide, it provides a
12 comparison of the number of acres that would be
13 curtailed under a steady state application of the model
14 versus a transient state application of the model under
15 different curtailment scenarios?

16 A. Yes.

17 Q. And this data was prepared to show those who
18 participated in the technical working group, that a
19 transient state application results in exponentially
20 more acres being curtailed in response to a predicted
21 demand shortfall than under a steady state; is that
22 correct?

23 A. It is approximately one order of magnitude,
24 yes.

25 Q. Okay. Let me have you go back to page 15 of

1 that exhibit. This slide is titled "Predicted response
2 to May 1 curtailment of water rights junior to October
3 11, 1900." Yes?

4 A. Okay. Just to clarify, because there is two
5 in a row that have that title. Is it the bar chart or
6 the line graph?

7 Q. The line graph.

8 A. Okay.

9 Q. And thank you for that clarification. I
10 appreciate that.

11 Ms. McHugh may have asked you this, so I don't
12 mean to be repetitious. But can you explain why the
13 date October 11th, 1900 is selected?

14 A. I asked Matt Anders what the, you know,
15 controlling priority date was. And my understanding
16 from him is that Twin Falls Canal Company and North Side
17 Canal Company have natural flow rights to the Snake
18 River with that priority date. So any ground -- you
19 know, there is some small amount of ground water use
20 that is senior to that. And, obviously, they weren't
21 included in the curtailment scenarios, because they are
22 senior to the delivery call water right.

23 Q. The number of ground water rights senior to
24 that 1900 date is very, very small; is that right?

25 A. It's pretty small.

1 Q. Generally speaking, a 1900 curtailment date
2 will result in curtailment of every ground water right
3 from the Eastern Snake Plain Aquifer?

4 A. Well, again, like I said, there are some that
5 are senior, and there are some that are outside the area
6 of common ground water supply, which would not be
7 subject to administration and so -- but it would
8 be -- it would be a very large percentage of -- yes.

9 Q. And you've got a slide. I don't have the
10 number in front of me. But a slide that shows that with
11 an October 11th, 1900 curtailment date, there would be
12 941,400 curtailed acres; is that right?

13 A. That sounds right. What I recall is it's
14 approximately 941,000. Yeah, 941,400.

15 Q. Okay. So just to connect the dots. Your
16 transient modeling shows that anytime there is a
17 predicted demand shortfall of 97,700 acre-feet or more,
18 in the absence of mitigation, you would have curtailment
19 of 941,400 acres?

20 A. Approximately, yes.

21 Q. Okay. Let me have you flip forward again to
22 page 20. We reviewed this a moment ago. But on the
23 right side of the table, it compares the number of acres
24 that would be curtailed under the transient state
25 application of the model versus a steady state. These

1 are aquifer wide figures, or maybe to be more precise,
2 this is the area within -- this is within the area of
3 common ground water supply?

4 A. Yes.

5 Q. Did you analyze what the transient state reach
6 gains would be from curtailment ground water district by
7 ground water district before the Fifth Methodology Order
8 was issued?

9 A. Not for this, not in connection with the Fifth
10 Methodology Order.

11 Q. Had you done that in connection with other
12 modeling work?

13 A. And I can't recall exactly what I did. But I
14 was asked to do some modeling in support of the
15 settlement discussions between the parties. And I
16 recall I was asked to do something by ground water
17 district. And I don't recall exactly what I did, or how
18 it would or would not fit in with what you just asked in
19 your question. But it was not for this proceeding.

20 Q. Okay. Were you aware prior to when the Fifth
21 Methodology Order was issued, were you aware of the
22 different transient state impacts by ground water
23 district on the near Blackfoot to Minidoka reach?

24 A. I mean, yes, I'm aware of different impacts
25 from different locations in the aquifer, certainly.

1 (Exhibit 197 marked.)

2 Q. (BY MR. BUDGE) Let me have you turn to
3 Exhibit 197. Jennifer, do you recognize this document?
4 It's labeled "Attachment 1, IGWA Proportionate Share
5 Modeling, May 2023 Curtailment"?

6 A. I believe I did see this in one of the expert
7 reports that was submitted.

8 Q. This was a document prepared by Jaxon Higgs.
9 And I just want to ask if you are familiar with any of
10 the data that's in here. And maybe what I'll do is I'll
11 just note in the column labeled "IDWR Portion of April
12 2023 Predicted Demand Shortfall," there is actually two
13 columns there. There is an acre-foot column and a
14 percentage column. And if you go to the bottom of the
15 acre-foot column, you'll see the figure 63,645
16 acre-feet. Do you see that figure?

17 A. Yes.

18 Q. You understand that that represents IGWA's
19 proportionate share of the total predicted demand
20 shortfall of 75,200 acre-feet?

21 A. Yes.

22 Q. And then if you go to the next block of
23 columns on the right, kind of in the middle of the
24 spreadsheet. There is a column that says, "Transient
25 May to September Impact." And that's showing the May to

1 September reach gains from near Blackfoot to Minidoka
2 reach from curtailment in each of those districts. Do
3 you see that column?

4 A. I see that column.

5 Q. Are you familiar with the data that's shown in
6 that column that shows the reach gains attributable to
7 curtailment within each ground water district?

8 A. I did not develop that, those columns. That
9 analysis I believe was done by Jaxon.

10 Q. Is this an analysis that you've done
11 independently for other purposes, or it's just part of
12 your general modeling work for the Department?

13 A. I have not done that analysis for -- I did not
14 do that analysis for this priority date, no.

15 Q. Okay. Have you done that for other
16 curtailment dates?

17 A. I don't think I did it for any curtailment
18 dates, no.

19 Q. Have you done that analysis in any other
20 context?

21 A. Again, I did some sort of analysis by ground
22 water district for the discussions in the settlement
23 talks. And I don't recall exactly what I did. I did
24 not review that in preparation for this hearing.

25 Q. Okay. So I understand this is Jaxon's

1 analysis. But if you look at that column, maybe we'll
2 go to the bottom line for North Snake Ground Water
3 District. It shows that curtailment of every water
4 right junior to 1900 in North Snake Ground Water
5 District would curtail 217,000 acre-feet. And the
6 transient benefit to near Blackfoot to Minidoka reach
7 from May to September would be 0.06 acre-feet.

8 Were you generally familiar, or did you
9 understand prior to when the Fifth Methodology Order was
10 issued, that curtailment of water rights in North Snake
11 Ground Water District would provide essentially no reach
12 gains to the Coalition?

13 A. During this irrigation season, I didn't do the
14 analysis. But, yes, you would expect that.

15 Q. Okay. So Jaxon's figures are consistent with
16 your general understanding of the transient impacts by
17 ground water district?

18 A. Yes, they are consistent with my general
19 understanding. Yes.

20 Q. Thank you. During your work related to
21 development of the Fifth Methodology Order, did you ever
22 inform Matt Anders or the Director that curtailment in
23 places like North Snake, Henry's Fork, Madison are
24 likely or at least predicted to provide little if any
25 benefit to the Coalition?

1 A. Well, they will provide benefits in future
2 years in years of -- so they do provide long-term
3 benefits. And they do have long-term impacts on the
4 water in the river reach. So if you don't include them,
5 then you are putting the -- you are basically shifting
6 the responsibility for the shortfall to those users that
7 are closest to the reach, and have the most immediate
8 impact, even though the impacts have been caused by
9 decades of pumping of people that are also further away.
10 So we did have some discussion about that at some point.

11 Q. Okay. And as part of that discussion, did you
12 explain that there wouldn't be any benefit in terms of
13 mitigating the predicted demand shortfall for 2023?

14 A. I don't recall whether or not we specifically
15 discussed that.

16 Q. Okay. So to your knowledge was information
17 provided to the Director before he issued the Fifth
18 Methodology Order that would have made him aware that
19 curtailment in North Snake Ground Water District, Carey
20 Valley Ground Water District, Henry's Fork Ground Water
21 District, and Madison Ground Water District would
22 provide no reach gain benefits to the Coalition in 2023?

23 A. I was not asked to provide any analysis by
24 ground water districts for the Fifth Methodology Order.
25 So, no, he would not have had that specific information

1 by ground water district.

2 Q. Okay. Aside from that information being
3 specific to a ground water district, did you advise the
4 Director that just generally speaking curtailment in
5 these further away locations would not provide any
6 benefit to the Coalition in 2023?

7 A. I don't recall.

8 Q. To your knowledge the Director did not have
9 the benefit of this type of information before him when
10 he issued the Fifth Methodology Order?

11 A. I don't know.

12 (Exhibit 929 marked.)

13 Q. (BY MR. BUDGE) Okay. Let me have you turn
14 next to the Exhibit 929. Jennifer, this is a copy of
15 IDAPA 37.03.11, the Rules for Conjunctive Management of
16 Surface and Ground Water Resources. Do you have that in
17 front of you?

18 A. Yes.

19 Q. We refer to these generally as the Conjunctive
20 Management Rules. Are you familiar with these rules?

21 A. To some extent.

22 Q. I'm just going to draw your attention to page
23 4 -- excuse me -- page 5. Do you see Rule 20.03?

24 A. Yes.

25 Q. If you can just take a moment to read Rules

1 20.03 and 20.04. And let me know if you are familiar
2 with these rules?

3 A. (Witness complying.) I'm familiar with them
4 to the extent that I'm aware they exist.

5 Q. Okay. I'll draw your attention to the last
6 sentence in Rule 20.03, and I'll read that. It says,
7 "An appropriator is not entitled to command the entirety
8 of large volumes of water in a surface or ground water
9 source to support his appropriation contrary to the
10 public policy of reasonable use of water as described in
11 this rule."

12 Were you asked to do any ground water modeling
13 related to the disparity and -- let me strike that
14 question.

15 Did this rule ever come up in your discussions
16 with Matt Anders or other Department staff relative to
17 the development of the Fifth Methodology Order?

18 A. I did not discuss those types of legal aspects
19 with them, no.

20 Q. Okay. And Rule 20.04 refers to the futile
21 call doctrine. Did that ever come up in your
22 discussions with Matt Anders or other Department staff
23 relative to the development of the Fifth Methodology
24 Order?

25 A. Not that I recall, no.

1 Q. So you performed no analysis of the magnitude
2 of curtailment compared to the predicted benefit to the
3 Surface Water Coalition?

4 A. Well, I did present the magnitude of
5 curtailment compared to the benefit of curtailment.
6 That data are in Exhibit 318.

7 Q. Okay. Aside from page 20 of Exhibit 318, you
8 didn't do any other analysis that compares the magnitude
9 of curtailment to the predicted benefit to the
10 Coalition?

11 A. No.

12 Q. Are you familiar with the concept of a
13 trimline that has been used in delivery calls?

14 A. Yes.

15 Q. Can you explain what you understand that term
16 to mean?

17 A. My understanding is it's an area designation
18 that identifies -- it identifies an area beyond which
19 the impacts of pumping are de minimis to the reach of
20 interest.

21 Q. Okay. Did the concept of a trimline ever come
22 up in your work related to the Fifth Methodology Order?

23 A. Again, I don't recall discussing a trimline
24 with respect to this proceeding.

25 Q. So you didn't ask Matt Anders or the Director

1 if that's something you should look into?

2 A. Not that I recall.

3 Q. And neither of them instructed you not to
4 evaluate trimlines?

5 A. No, I don't recall receiving any instruction
6 about trimlines.

7 Q. Okay. Let me next have you turn to Exhibit
8 301. This is what we called an As-Applied Order of the
9 April 2023 As-Applied Order. I believe Ms. McHugh asked
10 you some questions about this document. This is
11 something you are familiar with, Ms. Sukow?

12 A. Yes.

13 Q. If you'll flip to page 5. At the bottom of
14 page 5 there is a footnote, Footnote 5. And it
15 identifies the proportionate mitigation obligation of
16 IGWA as 63,645 acre-feet. Is that a calculation that
17 you made using the model?

18 A. Yes.

19 Q. As you know IGWA is made up of several ground
20 water districts. Before the Fourth Methodology Order
21 was issued, had you calculated each individual ground
22 water districts proportionate share of that 63,645
23 acre-foot figure?

24 A. I don't refer to it as a proportionate share,
25 because they did not -- they didn't have mitigation

1 plans. But our attorney, Garrick Baxter, asked me to
2 calculate the percentage of IGWA's proportionate share
3 that could be assigned to each ground water district, I
4 believe, in a response to a request that was made by
5 yourself or one of the other attorneys.

6 Q. Yes. Thank you.

7 (Exhibit 126 marked.)

8 Q. (BY MR. BUDGE) If you could turn to Exhibit
9 126.

10 A. I don't have that one.

11 MR. FLETCHER: 126?

12 MR. BUDGE: Yes, 126.

13 Q. (BY MR. BUDGE) Jennifer, what I have in front
14 of me is Exhibit 126 is an email from Garrick Baxter to
15 myself and others. And the subject line says, "Request
16 to delineate proportionate shares of mitigation
17 obligation." Do you see that?

18 A. Sorry. Say that again.

19 Q. The Exhibit 126 that I have up is an email
20 from Garrick Baxter to myself and others --

21 A. Yes.

22 Q. -- is that what you see?

23 A. Yes. Yes.

24 Q. Okay. In that email there is a table that
25 shows the ground water districts, and their

1 proportionate percentages in acre-feet with respect to
2 the 63,645 acre-foot mitigation obligation of IGWA. Do
3 you see that table?

4 A. Yes.

5 Q. Did you generate the data that's shown in this
6 table?

7 A. Yes.

8 Q. Okay. And you mentioned a moment ago that you
9 were asked by Mr. Baxter to apportion out IGWA's
10 mitigation obligation, the 63,000 acre-foot figure among
11 the ground water districts. Does this reflect your
12 analysis in that regard?

13 A. Yes.

14 Q. That middle column that has acre-foot figures
15 totaling 63,645 acre-feet. I want to ask you some
16 questions about that. And we can continue to use North
17 Snake Ground Water District as an example. But on that
18 bottom row for North Snake, it shows that its portion of
19 the 63,645 acre-feet is 3,262 acre-feet. Does this
20 table indicate that curtailment of every water right
21 within North Snake junior to December 30th, 1953, that
22 would produce a transient state reach gain to the
23 Surface Water Coalition of 3,262 acre-feet?

24 A. No, it does not.

25 Q. What does this column represent then?

1 A. So this is not -- this column is not looking
2 at the benefit of curtailment. This column is looking
3 at what their share of the demand shortfall is if they
4 are going to mitigate by providing storage water. And
5 the shortfall is the result -- this year's shortfall is
6 the result of decades of pumping. So if they are going
7 to mitigate by providing storage water, then their share
8 of the demand shortfall is based on their long-term
9 impact.

10 Q. Okay.

11 A. Not what will happen as a result of curtailing
12 starting this May.

13 Q. Okay. And the demand shortfall predicted in
14 the As-Applied Order that's a predicted demand shortfall
15 for the 2023 irrigation season; correct?

16 A. Yes.

17 Q. And under this approach to allocating that
18 predicted demand shortfall. Some ground water districts
19 such as North Snake would have to provide more water as
20 mitigation than the Coalition would receive from
21 curtailment. And other ground water districts would
22 have to provide less water as mitigation than the
23 Coalition would receive from curtailment?

24 A. I don't think that's true as far as the
25 Department's concerned. IGWA's proportionate share is

1 63,645 acre-feet. And the Department, I don't think,
2 has a say in how you decide to split that up. You asked
3 us to provide a breakdown, and I did it by this method.
4 And Garrick sent it to you as a courtesy. But we are
5 not telling you that that's how you have to split up the
6 proportionate share.

7 Q. Yeah. And I appreciate that. And I don't
8 actually even mean to be critical of the method. It's
9 just one method; right? It's not the only method. And
10 I just wanted to highlight that under this method in the
11 proportionate mitigation obligations don't match up with
12 the transient modeled reach gains?

13 A. No, they do not.

14 MR. BUDGE: Okay. Thank you, Jennifer. I
15 don't have any further questions.

16 THE HEARING OFFICER: Okay. Thank you,
17 Mr. Budge.

18 Do we want to take a break?

19 MR. FLETCHER: Yes.

20 THE WITNESS: I could use a restroom break, if
21 I'm allowed to ask.

22 THE HEARING OFFICER: Yes. Let's break for
23 ten minutes. We'll be back at 11:30.

24 (Recess.)

25 THE HEARING OFFICER: Back on the record,

1 Colleen. All right. We are recording again.

2 More questions of Ms. Sukow. Mr. Harris.

3 CROSS-EXAMINATION

4 QUESTIONS BY MR. HARRIS:

5 Q. Ms. Sukow, I'm Rob Harris, attorney for the
6 City of Idaho Falls. I have just some follow-up
7 questions to some of your prior testimony.

8 Mr. Budge talked to you about the IDWR
9 irrigated lands datasets. Could you just explain to me
10 what those are again?

11 A. They are delineation of -- a land use
12 delineation done by IDWR GIS staff that delineates land
13 units --

14 MR. BAXTER: Sorry, Director. We're not able
15 to hear Ms. Sukow online.

16 THE WITNESS: Sorry. I had my microphone off.

17 THE HEARING OFFICER: Okay. Are we okay?
18 Let's try.

19 THE WITNESS: The irrigated lands datasets are
20 delineations of land use by IDWR's GIS staff, where they
21 delineate land unit boundaries, and then classify them
22 as either irrigated, non-irrigated, or semi-irrigated.

23 Q. (BY MR. HARRIS) And so those are hand
24 digitized maps of irrigated acres; correct?

25 A. Correct, yes.

1 Q. And those irrigated lands datasets are used to
2 calibrate the ESPAM model; correct?

3 A. They are used in calculation of the water
4 budget input data that's used in the calibration, yes.

5 Q. So the answer is, yes, they are used in your
6 model calibration?

7 A. They are used in the model calibration, yes.

8 Q. To the best of your knowledge, is there
9 anything else that they are used for within IDWR?

10 A. There probably is, but I'm not specifically
11 aware.

12 Q. When you say "probably," what makes you say
13 that?

14 A. I have the general impression that I am not
15 the only one that uses them.

16 Q. Okay. You testified about calibrating the
17 ground water model and minusing out return flows from
18 the Twin Falls Canal Company return flows; is that
19 correct?

20 A. I said that they are used in the calculation
21 of the Kimberly to King Hill reach gain target.

22 Q. Okay. And so you used river gaging
23 information to help with that calibration; correct? Or
24 I should ask, do you use river gage information for that
25 calibration of --

1 A. We use river gage information in the
2 calculation of reach gains. So that's to calculate an
3 observation, a physical observation of how much of the
4 river flow is coming from the aquifer.

5 Q. And do you also do that in the near Blackfoot
6 to Minidoka reach?

7 A. Yes.

8 Q. So could you just generally explain how you
9 calibrate model runs to what's actually seen or measured
10 in the Snake River from near Blackfoot to Minidoka?

11 A. So we have -- during the model calibration we
12 have model input data that we use that, you know, we put
13 aquifer recharge and discharge in. And then we try to
14 match observations. And in model calibration, there are
15 adjustable parameters, like aquifer transmissivity,
16 specific yield, and some other components that are
17 adjusted to best match observed data. So some of that
18 observed data is aquifer head, some of it is aquifer
19 interaction with the river. So places where the aquifer
20 either discharges to the river or receives recharge from
21 the river. And those observations of reach gain are
22 used as calibration targets.

23 Q. So let me just to make sure I understand, let
24 me use a hypothetical. Let's say that there is 5,000
25 cfs measured in the river. How do you determine how

1 much of that is from snow melt versus reach gains from
2 ground water in that reach?

3 A. You take all of the known surface components
4 and account for them. So you have your measured inflow
5 on the upstream end of your reach. Your measured
6 outflow on the downstream end of your reach. You have
7 diversions from the reach that you account for. You
8 have surface return flows that you account for. And
9 also you might have tributary surface streams that you
10 have a measurement that you account for. So you just
11 account for all those surface inflows and outflows. And
12 then you have a residual. And the residual is your best
13 estimate of the contribution of ground water to that
14 reach.

15 Q. I see. And in terms of the measurements that
16 you use in that calibration, do you obtain that
17 information from Water District 1 and its watermaster,
18 Tony Olenichak?

19 A. Some of it.

20 Q. When you say "some of it," is there anything
21 specifically that you recall that you would obtain from
22 him?

23 A. The diversion data are obtained from the Water
24 District 01 records.

25 Q. You had mentioned too, though, that you will

1 look at water supply from other tributary basins in your
2 calibration. Did I understand your testimony correctly?

3 A. In a few cases there is a tributary stream,
4 for example, you know, the Malad River, for example,
5 above the springs. There is flow in that river, and we
6 have to account for that when we calculate the reach
7 gains. Lower Salmon Falls Creek is another example of
8 that.

9 Q. But I want to focus more on the near Blackfoot
10 to Minidoka. Do you or did you in your calculations, do
11 you look at flows out of either Willow Creek, the
12 Blackfoot Basin, or the Portneuf Basins in that
13 calibration?

14 A. Yes, I know the Portneuf is in that
15 calibration or that calculation. The reach gains above
16 Minidoka are actually calculated for me by another staff
17 member. I do have a list of all the inflows and
18 outflows that are accounted for, but I don't have them
19 memorized.

20 Q. Who is that other staff member who calculates
21 those reach gains?

22 A. Ethan Geisler, Guys-ler. I'm not sure how to
23 pronounce his last name.

24 Q. And he works for the Department?

25 A. Yes.

1 Q. Is he a modeler as well?

2 A. No.

3 Q. Okay. You were asked before about the model
4 runs that were presented in your PowerPoint
5 presentation. I don't need you to refer to it. But
6 just a follow-up question. In any of the model runs
7 that you did for curtailment, were any ground water
8 rights removed from those runs?

9 A. I'm sorry. Could you say that question again?

10 Q. Yeah. In the model runs that you performed,
11 you didn't take out like, for example, A & B Irrigation
12 District's ground water rights in those simulations?
13 They were all just ground water rights on the Eastern
14 Snake Plain Aquifer within the area of common ground
15 water supply; is that right?

16 A. For the simulations that were presented for
17 the various curtailment dates?

18 Q. Correct.

19 A. Yes. So anything within the area of common
20 ground water supply junior to those curtailment dates,
21 yeah.

22 Q. Yeah. And I just want to make sure that it
23 included all ground water rights in there for any
24 specific reason that there were any that were left out.
25 None were left out on these curtailment runs?

1 A. Yeah, I -- well, so we have -- yeah. Anything
2 that's in our irrigation POD file, and anything that's
3 in the municipal files.

4 Q. Just a couple follow-up questions. In the
5 methodology order there is an April forecast supply
6 methodology. And I just want to ask, did you provide
7 any technical information on the forecasted supply that
8 only looks at the unregulated flow at Heise?

9 A. I'm sorry. Say that again.

10 Q. Well, in the methodology order, there is a
11 part that forecast the water supply. Are you familiar
12 with that part of the order where it looks at the
13 unregulated flow at the Heise gage on the Snake River.

14 A. No, I didn't participate in that.

15 Q. And that's really my question. Is you weren't
16 asked to provide any technical information on that part
17 of the order; were you?

18 A. No.

19 Q. But as far as the technical aspects that you
20 were asked to participate in, did you have any
21 discussions on those technical aspects with Mat Weaver
22 or other Department staff?

23 A. I probably did. I don't have a specific
24 recollection.

25 Q. Okay. When you say "you probably did," what

1 makes you say that?

2 A. I'm sure we just -- I mean, we discussed what
3 I was going to present to the technical working group.

4 MR. HARRIS: Okay. I have no further
5 questions. Thank you.

6 THE HEARING OFFICER: Further questions by the
7 ground water users of Ms. Sukow?

8 Okay. Let's shift.

9 MR. ANDERSON: Director, very, very quick.

10 Mr. Anderson.

11 CROSS-EXAMINATION

12 QUESTIONS BY MR. ANDERSON:

13 Q. Jennifer, when did you first learn that the
14 Fifth Methodology Order was going to move from steady
15 state to transient?

16 A. I don't know when Gary made a final decision
17 on it. I know when I was asked to provide information
18 on it. And that was -- that was for the technical
19 working group.

20 Q. So after the technical working group, the next
21 time you knew that it was actually going to change to
22 transient, was when it came out in April, or did you
23 know before the issuance of the order that it was going
24 to?

25 A. I knew when I was asked to assist with

1 preparing the draft order.

2 Q. And when was that?

3 A. I don't recall exactly. Not that long before
4 it came out.

5 Q. A few weeks, a month?

6 A. I don't recall.

7 Q. You don't recall. But when you were asked to
8 prepare the draft order to assist in the preparation,
9 you knew then that it was going to move from steady
10 state to transient?

11 A. Yes.

12 MR. ANDERSON: Okay. I don't have any further
13 questions.

14 THE HEARING OFFICER: All right. Thank you.

15 With no further questions from the ground
16 water users, we'll shift to the Surface Water Coalition.
17 Mr. Simpson, you stood up. Are you the examiner?

18 MR. SIMPSON: An examiner, Mr. Director. So I
19 thank you for that acknowledgment.

20 CROSS-EXAMINATION

21 QUESTIONS BY MR. SIMPSON:

22 Q. Good morning, Ms. Sukow. My name is John
23 Simpson. I represent A & B Irrigation District, et al.,
24 with Mr. Thompson. I just have a couple follow-up
25 questions for you.

1 If you could turn to Exhibit 318 from which
2 you testified to before. And I believe that's your
3 slide presentation from November. And, Jennifer, if you
4 could just look at pages 21 and 22. I believe those are
5 your conclusions; is that correct?

6 A. That's correct.

7 Q. Those are your conclusions from the modeling
8 you produced as a part of that presentation in November;
9 correct?

10 A. Correct.

11 Q. As you sit here today, are those still your
12 conclusions that you would represent to the Hearing
13 Officer and to the parties in terms of the modeling
14 exercise you completed in the comparison between steady
15 state and transient?

16 A. Yes.

17 Q. Okay. And then if you would look at page 6 of
18 that presentation. And that's the graph that you
19 testified to earlier regarding examination by
20 Ms. McHugh. Do you see the paragraphs in the middle of
21 the graph regarding the "Less than 15 percent of the
22 steady state impacts of a single-season curtailment are
23 realized." Do you see that language in that graph, that
24 insert?

25 A. Yes.

1 Q. Okay. And that's your conclusion; correct?

2 A. Yes, that's --

3 Q. Yes.

4 A. -- data from the analyses.

5 Q. Right. So that would support your conclusions
6 on page 21 and 22, that the basis for why steady state
7 analysis is not appropriate for short-term river reach
8 gains; is that correct?

9 A. Well, I think beyond that, because the steady
10 state simulations do not simulate the short-term
11 curtailments that are prescribed in the Surface Water
12 Coalition methodology.

13 Q. Okay.

14 A. But the difference in volume is just the
15 result of doing something that does simulate the
16 short-term curtailment.

17 Q. Right. So if you utilize the steady state
18 model run, you are just not going to realize the amount
19 of water into the reach to mitigate for the identified
20 injury in the Fifth Methodology As-Applied Order;
21 correct?

22 A. Not within this irrigation season.

23 Q. And so then the second item is in response to
24 questions by Ms. Klahn regarding the south side returns
25 and the consideration of those south side flow returns.

1 Do you recall that testimony?

2 A. Yes.

3 Q. Okay. And those numbers identified by
4 Ms. Klahn that you testified to, were those estimates of
5 the ground water recharge contribution from irrigation
6 on the North Side Canal Company system?

7 A. I believe she was asking me about inflows from
8 the south side.

9 Q. From the south side. With respect to those
10 south side return flows, and the numbers you've
11 testified to, or were asked about. Were those in
12 response to the estimations, calculations regarding the
13 estimated ground water return flows from irrigation on
14 the Twin Falls system; do you recall?

15 A. Oh, I think you said north side, and I was
16 confused.

17 Q. If I did, I apologize.

18 A. No, they are measured flows in the return
19 channels, which are on the south side deeply incised.
20 And in a previous version of ESPAM, we were estimating
21 those based on a water budget method, which is I think
22 what you are asking about. But I determined that our
23 measurements were giving us the same volume. And then
24 having the actual measurements is much better for
25 calculating the reach gain, because it accounts for the

1 seasonality.

2 Before we had been averaging it. But with the
3 measurements, we're actually able to account for the
4 monthly seasonality, which gave us -- allowed us to
5 remove a fair amount of noise from our reach gain
6 calibration target.

7 Q. So those south side return flows that you are
8 discussing, were those only the Twin Falls return flows,
9 or did those include some other tributaries to the Snake
10 River on the south side of the river?

11 A. Well, there is Lower Salmon Falls Creek,
12 which, you know, we deduct out the total flow in Lower
13 Salmon Falls Creek. Some of that is from return flows,
14 but we don't really care whether it's from return flows
15 or other surface flows. We just deduct off the entire
16 creek flow.

17 Q. Okay.

18 A. And then there is also return flows from
19 surface return flows from the north side that we deduct
20 off?

21 Q. Correct.

22 A. Yeah.

23 Q. And then Mr. Budge was asking you about a
24 calculation that you did with respect to dividing up the
25 IGWA's proportionate share under the Footnote 5, I

1 believe, of the As-Applied Order. Do you recall that
2 testimony?

3 A. Yes.

4 Q. I'm not sure if I fully appreciated the
5 calculation you made. But my understanding is that your
6 method that you utilized, and this was your proposed
7 method, acknowledged the long-term impacts of each
8 ground water district on the Blackfoot to Minidoka
9 reach. And then once that percentage was calculated,
10 then it was utilized in the calculation of the
11 responsibility of each ground water district of the
12 total for IGWA; is that correct?

13 A. Well, and again, that was provided as a
14 courtesy, and the Department is not telling them, IGWA
15 what each ground water districts responsibility is. But
16 it is just an apportioning of it based on their
17 long-term impacts.

18 Q. Right. And with respect to your work under
19 Exhibit 318, you weren't asked whether or not to
20 consider, when you looked at the curtailment scenarios
21 and transient curtailment, and the number of acres to be
22 curtailed as you've testified here today, whether or not
23 any of those acres were the subject of ongoing
24 mitigation plans or stipulated agreements; were you?

25 A. I'm sorry. Say that again.

1 Q. Well, simply your work that you did for
2 Exhibit 318, the modeling you produced in November.
3 Didn't consider whether or not any of the ground water
4 acres that you identified that would be subject to
5 curtailment, were part of an existing or an approved
6 mitigation plan?

7 A. No.

8 MR. SIMPSON: Okay. That's all the questions
9 I have. Thank you.

10 THE HEARING OFFICER: Any other questions from
11 the Surface Water Coalition?

12 Mr. Fletcher, you represent clients
13 independent of Mr. Simpson.

14 MR. FLETCHER: Yeah, I don't have any
15 additional questions. Thank you.

16 THE HEARING OFFICER: Okay. Thank you.

17 All right. So let's now characterize the next
18 examination as a redirect. So let's just go in the same
19 order as previously followed.

20 Ms. McHugh, questions?

21 MS. MCHUGH: I have no redirect. Thank you.

22 THE HEARING OFFICER: Ms. Klahn?

23 MS. KLAHN: No, Your Honor.

24 THE HEARING OFFICER: Any of the others who
25 questioned, further questions of Ms. Sukow?

1 MR. WOOD: I've got a question, Director.

2 THE HEARING OFFICER: Okay. Mr. Wood.

3 REDIRECT EXAMINATION

4 QUESTIONS BY MR. WOOD:

5 Q. Jennifer, do you recall Mr. Budge asking you a
6 couple questions about trimline?

7 A. Yes.

8 Q. And in your professional opinion would a
9 trimline be appropriate in this delivery call?

10 MR. BUDGE: Objection; foundation.

11 THE HEARING OFFICER: Sustained.

12 Mr. Wood, would you just lay a foundation with
13 her.

14 Q. (BY MR. WOOD) Jennifer, do you recall
15 Mr. Budge asking you a few questions about a trimline?

16 A. Yes.

17 Q. And what is a trimline?

18 A. I believe I answered that for Mr. Budge. But
19 it's a delineation of an area where pumping has a larger
20 than de minimis impact on the reach of interest.

21 Q. And so in this context, was your understanding
22 of Mr. Budge's question whether or not you were asked to
23 employ a trimline in this situation?

24 A. I think that's probably a fair
25 characterization, yes.

1 Q. And in your opinion --

2 MR. BUDGE: Objection. It misstates the
3 testimony.

4 THE HEARING OFFICER: Well, I'll allow an
5 opportunity to clarify, if you want.

6 Answer the question, please. If you remember
7 the question.

8 Q. (BY MR. WOOD) I'll put it this way.
9 Ms. Sukow, what was your understanding of why Mr. Budge
10 was asking you about a trimline?

11 A. I don't know why he was asking me about a
12 trimline.

13 Q. Would a trimline in your professional opinion
14 be appropriate for this delivery call?

15 MR. BUDGE: Objection. Mr. Director, may I
16 comment.

17 THE HEARING OFFICER: What's the basis of the
18 objection, Mr. Budge?

19 MR. BUDGE: In violation of the Director's
20 order limiting the scope of testimony. So what I asked
21 Ms. Sukow is if she had done any analysis or provided
22 any information to the Director. I understood we can't
23 ask her opinions on legal and policy issues based on the
24 Director's order, and so I did not ask those questions.
25 I just asked what analyses information she had provided

1 to the Director. So I don't think we can be in a
2 position where we can't ask questions about the thinking
3 and the group process. But then the Department can't
4 ask those questions.

5 THE HEARING OFFICER: Okay. Mr. Budge,
6 Mr. Wood, I will sustain the objection at least at this
7 point in time. But anticipating that there will be
8 further development and testimony regarding a timeline,
9 and Ms. Sukow may be recalled and the question may be
10 posed to her at that time.

11 Thank you, Mr. Wood.

12 MR. WOOD: Thank you.

13 THE HEARING OFFICER: Okay. Further questions
14 of Ms. Sukow anybody?

15 All right. Well, the timing is perfect I
16 guess. It's the lunch hour. So thank you, Ms. Sukow.
17 And thank you, Colleen. So let's recess for lunch. And
18 come back at what time; 1:00? We'll be back, convene at
19 1:00. Thank you.

20 (Lunch recess.)

21 THE HEARING OFFICER: We're back on the
22 record, Colleen. One suggestion before we start. Some
23 participating remotely have observed that it's difficult
24 to hear objections. You are farther away from the
25 microphone system. If you could speak up, and it might

1 help if you stand up. There is a microphone in the
2 ceiling somewhere there.

3 Okay. Is it my understanding that Mr. Colvin
4 is the next witness?

5 Mr. Colvin, if you would come forward, please.

6 DAVID COLVIN,

7 first duly sworn to tell the truth relating to said
8 cause, testified as follows:

9 THE HEARING OFFICER: Mr. Thompson, you may
10 examine Mr. Colvin.

11 MR. THOMPSON: Director, there should be a
12 Surface Water Coalition binder exhibits. Probably the
13 smallest skinniest ones back there. If you wouldn't
14 mind getting those out.

15 DIRECT EXAMINATION

16 QUESTIONS BY MR. THOMPSON:

17 Q. Dave, could you state and spell your name for
18 the record, please?

19 A. My name is Dave Colvin, spelled D-a-v-e, or
20 David, David, Colvin, C-o-l-v-i-n.

21 Q. And where do you presently work?

22 A. I work at LRE Water in Denver, Colorado.

23 Q. And what is your occupation?

24 A. I'm the ground water team leader, principal
25 hydrogeologist with the firm.

1 (Exhibit 3 marked.)

2 Q. (BY MR. THOMPSON) And in that binder we have
3 in front of you, we have what's marked as Exhibit 3.
4 Could you describe that, please?

5 A. That's Exhibit 3 is my expert report for the
6 Fifth Methodology Order and this hearing.

7 Q. And is your CV attached to that exhibit?

8 A. It is.

9 Q. And does that CV generally describe your
10 education and work history?

11 A. Yes, it does.

12 Q. Have you been qualified as an expert witness
13 before IDWR in prior cases?

14 A. I have.

15 Q. Are you a member of the Eastern Hydrologic
16 Modeling Committee?

17 A. Yes, I am.

18 Q. And did you participate in the technical
19 working group last fall?

20 A. I did, yes.

21 Q. And can you generally describe what you were
22 asked to do with that report identified as Exhibit 3?

23 A. I was asked to review the Fifth Methodology
24 Order and this year's As-Applied Order for steps 1
25 through 3, and look at the ground water modeling issues

1 in particular, and evaluate the procedures that were
2 implemented, and formulate my opinions.

3 Q. And do you want to describe your general
4 conclusions or just refer to those in the report?

5 A. Yeah. So in my report on page 2, I have a
6 summary of opinions. And so maybe I'll just run through
7 those opinions. And then the rest of my report goes
8 into greater detail. But in summary, I started with
9 Opinion No. 1, stating that ESPAM, specifically Version
10 2.2 is the widely accepted as the best available
11 scientific tool for evaluating regional ESPA hydrology,
12 particularly reach gain impacts due to curtailing ground
13 water pumping.

14 Opinion No. 2 was that the steady state use of
15 ESPAM for curtailment analysis in particular is
16 inappropriate due to the methodology's requirement for
17 in-season benefits from curtailment. And so the
18 in-season timing component renders a steady state model
19 ineffective and inappropriate for modeling curtailment
20 benefits. No. 3 is that the transient superposition
21 model for ESPAM2.2 is the appropriate model for
22 calculating the reach gain benefits from curtailing
23 junior ground water pumping.

24 No. 4 is that regardless of prior approaches
25 from other methodology orders, that transient is the

1 proper approach for the Fifth Methodology Order. No. 5
2 is that transient modeling of ESPA has been happening
3 for over ten years for various other applications of
4 ground water modeling.

5 And then No. 6 is that specific to the steady
6 state modeling that Ms. Sukow described for
7 proportionate share analysis of the demand shortfalls.
8 That that steady state modeling is appropriate for that
9 use, but only when it is applied to mitigation
10 requirements that might be covered by direct delivery of
11 surface water. And that that steady state modeling has
12 no bearing on the ground water curtailment approach to
13 mitigation.

14 Q. Thank you.

15 MR. THOMPSON: We would move to admit Exhibit
16 3 into the record.

17 THE HEARING OFFICER: Any objection to the
18 admission of this document?

19 Hearing no objection the document marked as
20 Exhibit 3 is received into evidence.

21 (Exhibit 3 received into evidence.)

22 MR. THOMPSON: And we would tender Mr. Colvin
23 as an expert on the subjects addressed in that report
24 for cross-examination. Thank you.

25 THE HEARING OFFICER: Thank you, Mr. Thompson.

1 Cross-examination? I want to call you, Max.
2 What's your last name.

3 MR. BRICKER: Bricker.

4 THE HEARING OFFICER: Mr. Bricker, you may
5 examine the witness.

6 MR. BRICKER: Thank you.

7 CROSS-EXAMINATION

8 QUESTIONS BY MR. BRICKER:

9 Q. Good afternoon, Mr. Colvin. How are you
10 doing?

11 A. Great.

12 Q. Good. Okay. Would you agree that the
13 Department uses ESPAM to determine which ground water
14 users must be curtailed or must supply mitigation water
15 to offset the predicted shortfall to the Surface Water
16 Coalition?

17 A. Yes.

18 Q. Okay. Now, in your report, Exhibit 3, it's
19 your opinion that transient modeling is the most
20 appropriate mechanism to determine the actual increase
21 in Snake River flow in the near Blackfoot to Minidoka
22 reach that would occur in the first year of curtailment;
23 right?

24 A. Yes.

25 Q. And you've also stated that the results from

1 the steady state run overestimated the curtailment
2 benefits by more than an order of magnitude; right?

3 A. For in-season benefits, yes.

4 Q. Okay. And you've also stated that the steady
5 state model curtailment results have been clearly
6 demonstrated to be a grievous error; right?

7 A. Yes.

8 Q. But Department staff has been aware of the
9 technical differences between the steady state and the
10 transient modeling runs for many years now; right?

11 A. I can't speak for their awareness, but I would
12 presume so.

13 Q. Okay. And the Department could have been
14 using transient model runs before 2023; correct?

15 A. Yes.

16 Q. So is it fair to say that the use of the
17 steady state runs in modeling was not in error, but was
18 made as a policy decision?

19 A. I wouldn't be able to speculate on policy
20 decisions.

21 Q. Okay. And you are aware as was asked of
22 Ms. Sukow, that there has been a moratorium on new wells
23 without mitigation since the early '90s; right?

24 A. Yes.

25 Q. So almost all wells have been pumping for at

1 least some 30 years now; correct?

2 A. Approximately.

3 Q. And looking at Exhibit 318, which was the
4 presentation by Ms. Sukow from last November.

5 A. Yes. Okay. I've got it.

6 Q. All right.

7 A. Do you have a page number you are referencing?

8 Q. I'm looking for it myself. You know what,
9 perhaps it isn't in this. It might be elsewhere. But
10 would you agree that over 90 to 99 percent of the impact
11 of pumping on the ESPA has been realized?

12 A. You must -- I think you might be referring to
13 page 6.

14 Q. Let's see. Yes, in fact, there it is.

15 A. Okay. Can you restate your question?

16 Q. Would you agree that 90 to 99 percent of
17 pumping impacts on the ESPA have been realized at that
18 particular river reach?

19 A. Approximately, yes.

20 Q. So wouldn't you agree that given that, a
21 steady state curtailment run is a reasonable estimate of
22 the current impact on Snake River flows in that reach
23 resulting from the current and prior pumping of those
24 curtailed wells?

25 MR. THOMPSON: Objection; a compound question.

1 Q. (BY MR. BRICKER) Would you agree that a
2 steady state curtailment run is a reasonable estimate of
3 the current impact on Snake River flows resulting from
4 current and prior pumping of curtailed runs -- or wells?

5 Excuse me.

6 A. No.

7 Q. Okay. All right. Would you agree that the
8 predicted shortfall in 2023 is 75,200 acre-feet?

9 A. That's what was in the Fifth Methodology
10 Order -- or the As-Applied Order, yes.

11 Q. Okay. So looking back at that Exhibit 318,
12 looking at page 13, the "Comparison priority dates
13 calculated for DS forecasts," the first of those two
14 pages. Curtailment of wells junior to sometime in the
15 mid-1980s would produce 75,200 acre-feet in the near
16 Blackfoot to Minidoka reach based on steady state
17 modeling; right?

18 A. It's hard to see in this graph here, but it
19 seems about right.

20 Q. Sometime in the mid to late '80s?

21 A. Sure.

22 Q. So in other words, the current and prior
23 pumping of wells junior to the mid-1980s is currently
24 depleting the near Blackfoot to Minidoka reach by about
25 75,200 acre-feet given that slide; right?

1 A. That would be the impact on the reach gains
2 there, so, yes.

3 Q. Okay. So if the wells junior to the mid-1980s
4 had not started pumping, there would be an additional
5 75,200 acre-feet in the river at that reach in 2023;
6 right?

7 A. If they had never started pumping, that would
8 be about the increase in reach gains, yes.

9 Q. Okay. So as a result, if the pumping of the
10 wells junior to the mid-1980s did not happen, there
11 would be no forecast shortage to the Surface Water
12 Coalition members; right, in 2023?

13 A. That's possible. And a very different
14 analysis than curtailment.

15 Q. Okay. Would you agree that it may be unduly
16 burdensome to curtail wells senior to the mid-1980s if
17 it were that those wells senior did not cause the 75,200
18 acre-foot shortage in 2023?

19 A. I haven't evaluated the burden of curtailment,
20 but the impacts to reach gains are due to the cumulative
21 pumping across the ESPA for many decades. And so you
22 can apportion it how you want, which is essentially what
23 IDWR did with their proportionate share analysis
24 but -- I guess can you restate your question?

25 Q. Sure. It was does it seem unduly burdensome

1 to force wells senior to the mid-1980s to be curtailed
2 if they were not the cause of the 75,200 acre-foot
3 shortage in 2023?

4 A. Well, again, I haven't evaluated the burden of
5 curtailment compared to being involved in an agreement
6 or mitigating by some other measure. So I guess I don't
7 know.

8 Q. How about instead of to force curtailment, but
9 to require mitigation water from?

10 A. Again, I haven't reviewed the burden of what
11 forced mitigation would require. So I don't really know
12 how to answer that question.

13 Q. How about if you change burden to, is it fair
14 to require mitigation or curtailment of those rights?

15 A. I guess I don't know what you mean by "fair."
16 But according to prior appropriation, if you mean is it
17 a priority date; is that fair? And I think under prior
18 appropriation administration, a priority date that
19 returns the demand shortfall to the Surface Water
20 Coalition is fair.

21 MR. BRICKER: Thank you. I have no further
22 questions.

23 THE HEARING OFFICER: Further
24 cross-examination?

25 Mr. Budge.

1 CROSS-EXAMINATION

2 QUESTIONS BY MR. BUDGE:

3 Q. Good afternoon, Mr. Colvin. Do you mind if I
4 call you "David"?

5 A. That's fine.

6 Q. I have just a few questions.

7 (Exhibit 306 marked.)

8 Q. (BY MR. BUDGE) First, if I could have you
9 turn to Exhibit 306.

10 A. Okay.

11 Q. What's that document title that you are
12 looking at?13 A. This is the Fourth Amended Final Order
14 Regarding Methodology for Determining Material Injury to
15 Reasonable In-Season Demand and Reasonable Carryover."16 Q. Thank you. That's the right one. I refer to
17 that as the Fourth Methodology Order. Were you working
18 for the Surface Water Coalition back when that was
19 issued?

20 A. No, I was not.

21 Q. When did you begin working for the Coalition?

22 A. I believe it was 2019 --

23 Q. Okay.

24 A. -- maybe 2018.

25 Q. And what type of work have you done for the

1 Coalition since then?

2 A. Evaluation of Eastern Snake Plain Aquifer
3 hydrology related to transfers or the agreement with
4 IGWA, monitoring the Eastern Snake Hydrologic Modeling
5 Committee and participating there, being involved in
6 technical work groups related to the sentinel well
7 tracking, and recharge planning, various other
8 activities on the plain.

9 Q. Is the methodology order that we're discussing
10 here, is that within the purview of the representation
11 you provide for the Coalition?

12 A. Yes.

13 Q. And you mentioned that you participate on the
14 Eastern Snake Hydrologic Modeling Committee?

15 A. Yes.

16 Q. Did you participate in the 2015 technical
17 working group that the Department held regarding the
18 methodology order?

19 A. I did not.

20 Q. Okay. Back to that exhibit you've got in
21 front of you. If you could flip to page 35?

22 A. Okay.

23 Q. About halfway down, there is a heading that
24 says "Order." And then it begins walking through the
25 steps of the methodology order. I assume you are

1 familiar with all of the steps?

2 A. Yes.

3 Q. Step 1, which you are familiar with, requires
4 members of the Coalition to report annually their
5 irrigated acreage to the Department. Are you familiar
6 with that step?

7 A. Yes.

8 Q. As a consultant for the Coalition, has the
9 Coalition or any member of the Coalition ever asked you
10 to help them evaluate the irrigated acres within their
11 service area?

12 A. No, that's kind of out of my specialty. I'm
13 more ground water focused.

14 Q. Got you. Are there people in your firm that
15 have that type of expertise?

16 A. There are.

17 Q. But that's not something the Coalition has
18 ever asked for your help with?

19 A. No.

20 Q. Have they ever shared with you the reports
21 that they submit to the Department, where they report
22 their irrigated acreage?

23 A. Not shared with me directly. I've seen them
24 posted, though.

25 Q. Okay. But that's not a component of the

1 methodology that they've consulted your advice in
2 relation to?

3 A. No.

4 MR. BUDGE: Okay. I don't have any further
5 questions.

6 THE HEARING OFFICER: Further examination of
7 Mr. Colvin?

8 Okay. Any redirect, Mr. Thompson?

9 MR. THOMPSON: I don't have any.

10 THE HEARING OFFICER: Mr. Colvin, you are off
11 easy.

12 THE WITNESS: Okay.

13 (Witness excused.)

14 THE HEARING OFFICER: Now, I understand the
15 next witness in the list is Matt Anders, an employee of
16 the Department.

17 If you'd come forward, Matt.

18 MATTHEW "MATT" ANDERS,
19 first duly sworn to tell the truth relating to said
20 cause, testified as follows:

21 THE HEARING OFFICER: Mr. Wood, you may
22 examine.

23 DIRECT EXAMINATION

24 QUESTIONS BY MR. WOOD:

25 Q. Hello, Mr. Anders.

1 A. Hello.

2 Q. Can you please state and spell your name for
3 the record.

4 A. My name is Matthew Anders. I go by Matt,
5 M-a-t-t, A-n-d-e-r-s.

6 Q. And what is your educational background?

7 A. I have a bachelor's in geology from Gustavus
8 Adolphus College, and a master's in geology from Utah
9 State University.

10 Q. And you're a licensed professional geologist
11 in Idaho; is that correct?

12 A. I am.

13 Q. And you are currently employed at the Idaho
14 Department of Water Resources?

15 A. I am.

16 Q. And how long have you worked for the
17 Department?

18 A. Worked a total of 18 years. I was a
19 contractor for about the first three. And then I worked
20 for the Department directly for about 15.

21 Q. And you are the technical services bureau
22 chief; is that correct?

23 A. I am.

24 Q. And how long have you been in that position?

25 A. About four months.

1 Q. And what are your duties as the technical
2 services bureau chief?

3 A. I either oversee directly or indirectly staff
4 from the hydrology section and the GIS section.

5 Q. I would like to turn your attention to the
6 Fifth Methodology Order.

7 A. Okay.

8 Q. Are you familiar with that document?

9 A. Yes.

10 Q. And some of that document you know quite a bit
11 about?

12 A. Yep, I do.

13 Q. And that you even played a role in developing
14 some of that data?

15 A. Yes, I did.

16 Q. And this is why you've been called as a
17 witness here today?

18 A. I believe so, yes.

19 Q. And you are aware that the Department has
20 identified nine topics for you to testify; is that
21 correct?

22 A. Yes.

23 Q. And I'm going list those line, and let me know
24 if this is correct. Okay?

25 A. Okay.

1 Q. Baseline year, forecast supply, surface water
2 irrigated acres, crop water needs. I am going to try
3 hard not to screw this one up -- near real-time mapping
4 evapotranspiration of high resolution with internalized
5 calibration?

6 A. It's evaporation, but, yes.

7 Q. See, I knew I wouldn't do it right. All
8 right.

9 Project efficiency?

10 A. Yes.

11 Q. Reasonable carryover?

12 A. Yes.

13 Q. Twin Falls Canal Company's increase in
14 diversions?

15 A. Yes.

16 Q. And that 2023 technical working group
17 meetings?

18 A. Yes.

19 Q. Do you have any concerns that you were
20 unqualified to discuss those topics here today?

21 A. No, I do not.

22 Q. One additional issue, Mr. Anders. You brought
23 to our attention some shapefiles that were not included
24 in the original, I guess we'll call it, a data dump on
25 May 5th; is that correct?

1 A. Correct.

2 Q. And as I understand it, we provided to the
3 parties the 2022 shapefiles for Minidoka and Milner.
4 And what we meant to provide was the 2023 shapefiles; is
5 that correct?

6 A. Correct.

7 Q. And the 2023 shapefiles are what is used in
8 the Fifth Methodology Order?

9 A. Yes.

10 Q. And those numbers are correct?

11 A. The methodology order, the acres that we used,
12 they are correct, yes.

13 Q. And you provided a zip file that had those two
14 files in them; is that correct?

15 A. Yes, I did.

16 Q. And we provided those to the parties this
17 morning. Did you have you an opportunity to look at
18 those files and ensure their accuracy?

19 A. Before I gave them to you, I inspected them,
20 yes.

21 Q. Okay. And do you think they are a reasonable
22 representation of what those shapefiles are, the
23 accuracy of the shapefiles?

24 A. Yes, I do.

25 MR. WOOD: And with that, Director, we would

1 move to admit the Minidoka and Milner 2023 shapefiles.

2 THE HEARING OFFICER: I assume that what you
3 are asking me to do is take official notice of them?

4 MR. WOOD: Or take official notice of them,
5 sure.

6 THE HEARING OFFICER: Any objection from the
7 parties?

8 Okay. I will take official notice of the 2023
9 shapefiles from Milner and Minidoka as represented.

10 Thank you, Mr. Wood.

11 MR. WOOD: The Department has no further
12 questions for Mr. Anders.

13 THE HEARING OFFICER: Okay. Examination of
14 Mr. Anders by the ground water users?

15 Ms. Klahn, I see you turning in your seat.

16 MS. KLAHN: That's right.

17 THE HEARING OFFICER: Welcome to the podium.

18 CROSS-EXAMINATION

19 QUESTIONS BY MS. KLAHN:

20 Q. Good afternoon, Mr. Anders. I'm Sarah Klahn,
21 representing the City of Pocatello. And it's nice to
22 see you in person after seeing you on Zoom for two days.

23 I wanted to start by asking you some questions
24 about the Fifth Methodology Order. You should have a
25 notebook up there with a 300 series of exhibits in it.

1 And you would be looking at Exhibit 300?

2 A. Binder one of Exhibit 300. And you said tab
3 300?

4 Q. Yes.

5 A. Yes, I have it.

6 Q. Okay. And let's turn, if you would, in
7 Exhibit 300 to page 12. Starting at paragraph 29, there
8 is a section of the order related to project efficiency.
9 And that's one of the topics you were disclosed for;
10 right?

11 A. Yes, it's at the bottom of the page.

12 Q. I wanted to ask you about the statement at the
13 bottom of the page there. The statement in paragraph 29
14 says, "Project efficiency is the ratio of total
15 volumetric crop water needs within a Surface Water
16 Coalition entity's boundary and the total volume of
17 water diverted by that entity to satisfy its crop
18 needs." The second sentence says, "It is the same
19 concept as efficiency, which was presented at the
20 hearing."

21 What's your understanding of what was
22 presented at the hearing? Or let's start with, which
23 hearing are we talking about; do you know?

24 A. I don't know.

25 Q. Okay. So this wasn't a sentence that you have

1 any knowledge of?

2 A. No, I didn't add that sentence.

3 Q. Okay. Well, let's flip over then to page 13.
4 And there is an equation at the top of the page. And
5 above that equation is some narrative about the
6 relationships that are contained in project efficiency.
7 And I want to ask you about those. So the first
8 component listed there is "seepage loss." Do you see
9 that?

10 A. I do.

11 Q. What is seepage loss in your understanding?

12 A. As water is -- after it's been diverted and is
13 being sent or conveyed to get to the place of use for
14 the water, there are losses out of the canals. Maybe
15 they are unlined. There is some small amount of
16 evaporation. If there happens to be vegetation, they
17 may be pulling. So it is kind of any losses in route to
18 where the water is going to be applied.

19 Q. Okay. The second item listed there is on-farm
20 application losses. And the first example is deep
21 percolation. Do you have an understanding of what that
22 means?

23 A. To me, deep percolation is when the soil
24 becomes saturated, because you are applying water. And
25 you get infiltration down below the root zone, so the

1 plants can no longer access it. And it may stay there,
2 or it may go farther all the way to the aquifer,
3 depending how much water is available.

4 Q. Okay. The second is "field runoff" listed
5 there in that parenthetical at the top of page 13. How
6 would you characterize "field runoff"?

7 A. To me, that's over land flow. So it's on the
8 surface of the land. Either the water is applied too
9 quickly, and it can't infiltrate, or the soil is
10 saturated. But in any either case, the water is running
11 off to someplace outside of the field.

12 Q. Okay. And then the third item there listed is
13 "system operational losses," and the parenthetical is
14 "(return flows)." How is that different in your
15 understanding from the other seepage and the on-farm
16 application losses?

17 A. I think of return flows as at the end of the
18 system, there is water that's needed to get to deliver
19 water to the end of the system. And there is always
20 excess water there. That water, I think where return
21 flow, the term comes from, either returns to the
22 original source or a different source of water.

23 Q. Okay. Now, the sentence up there at the top
24 of the page of page 13, goes on to say, "system
25 operational losses for which data is not obtainable by

1 the Department." Do you see that?

2 A. I do.

3 Q. But the Department has data associated with
4 Twin Falls Canal Company return flows; isn't that right?

5 A. We have some of the return flows monitored
6 through our Eastern Snake Plain's spring and return flow
7 monitoring program. But we don't have everything
8 monitored.

9 Q. Were you in the room this morning when
10 Ms. Sukow testified?

11 A. I was.

12 Q. And you heard her testify about the
13 incorporation of Twin Falls Canal Company return flow
14 data to calibrate the model?

15 A. Yeah, I heard her say that.

16 Q. Okay. And so your understanding is that the
17 Department has some Twin Falls return flow data, but
18 there is more that you don't have?

19 A. I think there are some return flows that are
20 small enough that were not -- we have decided not to
21 monitor.

22 Q. And are you aware that the return flows
23 associated with Twin Falls Canal Company operations are
24 in the neighborhood of 300,000 to 400,000 acre-feet a
25 year?

1 MR. THOMPSON: I'm going to object to that
2 question; characterization, foundation.

3 MS. KLAHN: I asked him if he was aware.

4 THE HEARING OFFICER: Overruled.

5 THE WITNESS: I'm not sure I knew that it was
6 that exact number. I've seen numbers, presentations
7 where they've talked about it, but I don't remember that
8 number specifically.

9 Q. (BY MS. KLAHN) All right. Let's talk for a
10 minute about that equation at the top of page 13. Could
11 you sort of just walk us through how the calculation
12 works, what each of the variables are?

13 A. Sure. The E_p is the project efficiency. And
14 that is equal to the crop water need, divided by the
15 demand or the diversion, the Q , the discharge of the
16 diversion. Crop water need is composed of, we use ET ,
17 we use precipitation, we use acres to calculate that.
18 The diversions are, those are directly measured that we
19 take from water right accounting.

20 Q. Okay.

21 A. From Water District 1.

22 Q. From Water District 1?

23 A. Yeah.

24 Q. Okay. So tell me if this is correct from a
25 mathematical perspective. As the irrigation diversions

1 go up, the project efficiency will go down. As the
2 denominator gets larger, the project efficiency gets
3 smaller; is that true?

4 A. If the crop water need stays the same, yes.

5 Q. Okay. In your work with the Department on the
6 methodology order, have you done any evaluation of
7 whether the project deficiencies that you are measuring
8 using this calculation are reasonable?

9 A. When we're doing our calculations, we are
10 always doing, you know, quality control, quality
11 assurance to see if the numbers make sense. And that's
12 on a technical level. You know, did it compare to
13 previous years, or compared to the previous month, is it
14 a reasonable number? So all of our calculations go
15 through that. We make our calculations. And Kara
16 Ferguson and I switch and review each other's data. So
17 just on the reasonableness of the calculations, yes, on
18 a numbers basis we're looking at.

19 Q. You were the lead of the technical work group
20 in November and December of 2022; is that right?

21 A. Yeah, correct.

22 Q. And there was some discussion there of project
23 efficiency and the methods that the Department uses to
24 calculate those. Do you recall that?

25 A. Yeah, I gave a presentation on project

1 efficiency.

2 Q. And Greg Sullivan, one of the consultants for
3 the Cities in this proceeding, provided some input on
4 alternative ways of looking at project efficiency using
5 the same kind of calculation that the Department was
6 using, but made some suggestions about other ways to
7 look at it. Do you recall that?

8 A. My recollection of, at the technical working
9 group, he presented us some graphs looking at the
10 relationship between crop water need and project
11 efficiency. I don't remember at that time that he made
12 a proposal about different ways to calculate it. But he
13 did in his expert report at a later date. He may have
14 stated that at the technical working group. I don't
15 remember it. But I do remember it from his technical,
16 his expert report.

17 Q. During the technical work group process was
18 there any conversation internally in the Department
19 about taking another look at how to do project
20 efficiencies, keeping in mind that you want to use this
21 kind of equation, but to try and I mean get a more
22 meaningful project efficiency measure?

23 A. We, on a technical level, we have discussed,
24 you know, the accuracy of the project efficiency, and
25 where errors may come in that calculation. But we

1 haven't gone down the road of like proposing, or even
2 working out possible ways to calculate it differently.

3 Q. Thank you. Could we turn now to page 10 of
4 Exhibit 300, please? And you'll recall during our
5 deposition, I had quite a log of questions for you on
6 acreage?

7 A. Yes.

8 Q. So based on the table that's shown in Exhibit
9 300, paragraph 22, the Department used the Twin Falls
10 Canal Company 2013 shapefile for purposes of Twin Falls
11 Canal Company acreage in this Fifth Methodology Order;
12 correct?

13 A. Yes.

14 Q. And I think you've testified during your
15 deposition, that this Twin Falls Canal Company acreage
16 shown in the table does contain hardened acres. Do you
17 recall that?

18 A. Yes.

19 Q. In other words, hardened acres would mean they
20 can't be irrigated?

21 A. Yeah, correct.

22 Q. And we also talked during your deposition
23 about the Department's previous reliance in earlier
24 methodology orders on lower numbers for Twin Falls Canal
25 Company acres. Do you recall that?

1 A. Yes, I believe it was about 183,000, and I
2 think they came from SPF.

3 Q. I think that's right.

4 (Exhibit 324 marked.)

5 Q. (BY MS. KLAHN) So let's take a look at some
6 of those values. I would like you to find in that same
7 notebook, I think in that same notebook, it should be
8 Exhibit 324.

9 A. No, this one only goes to 313.

10 Q. I guess it's in, we'll guess, Volume 2.

11 MR. WOOD: It should be in that.

12 THE WITNESS: Could you repeat the number I'm
13 looking for?

14 Q. (BY MS. KLAHN) Sure. It should be a 2015
15 PowerPoint that you prepared.

16 A. Yep, I'm to Exhibit 324.

17 Q. Okay. Could you identify that, please, for
18 the record?

19 A. The title -- well, it looks like it is a
20 printout of a PowerPoint presentation titled "Proposed
21 Modification to Method Determining Reasonable In-Season
22 Demand for the Surface Water Coalition: Irrigated Acres
23 for SWC Members, Presented to the SWC Methodology
24 Technical Working Group by Matt Anders, February 19,
25 2015."

1 Q. Okay. Let's turn, the pages are not numbered.
2 I believe it's page 3. There is a table.

3 A. "Summary of irrigated acres" is the bullet?

4 Q. Correct. And I want to draw your attention to
5 the bottom row of the table there, which shows the SPF
6 acres you referenced a minute ago, 183,589. So in 2013,
7 if we go all the way over to the right, "2013 RISD,"
8 what does that column represent?

9 A. That is acres that we used for the 2013 order
10 for the reasonable in-season demand calculation.

11 Q. Okay. So that number was used in 2013. The
12 same number was used in 2015; wasn't it?

13 A. Reviewing what we call the calculator, it
14 looked like that number was use from 2010 to 2014.

15 Q. 2014?

16 A. Yeah.

17 Q. You didn't use it in 2015?

18 A. When I looked at the calculator, we changed it
19 in 2015.

20 Q. Okay.

21 A. But that's based on what I see in the
22 calculator.

23 Q. Okay. Can I hand you -- or I'm not going to
24 hand you, because hopefully you have it in front of you.
25 We're looking at the IGWA notebook, Exhibit 135.

1 (Exhibit 135/306 marked.)

2 MS. KLAHN: TJ, any idea if that is Volume 1,
3 2, or 10?

4 MR. BUDGE: The numbers are on the binder.

5 THE WITNESS: They are in the common exhibits.

6 MS. KLAHN: No, it's in IGWA 135.

7 MR. SIMPSON: It's the same as 306.

8 MS. KLAHN: Yes.

9 THE WITNESS: I'm at Exhibit 135.

10 Q. (BY MS. KLAHN) Thank you. Would you identify
11 Exhibit 135 for the record, please?

12 A. It says it's the "Fourth Amended Final Order
13 Regarding Methodology for Determining Material Injury to
14 Reasonable In-Season Demand and Reasonable Carryover."

15 Q. And then let's turn to the last page.
16 Actually, let's turn to page 39.

17 MR. FLETCHER: Sarah, for the record, it's
18 already been admitted under a different number.

19 MS. KLAHN: Oh, it has. I apologize. I
20 missed that.

21 MR. FLETCHER: Well, we don't want any
22 confusion.

23 MS. KLAHN: Well, let's keep using 135, but I
24 won't admit it. How is that? I will start talking
25 about it as 306.

1 MR. FLETCHER: I just thought we should have
2 it on the record, it has been marked as 306.

3 Q. (BY MS. KLAHN) Okay. Let's not switch the
4 exhibit notebooks.

5 A. Okay.

6 Q. But I'm going to refer to this as Exhibit 306?

7 A. Okay.

8 MS. KLAHN: Thank you, Kent.

9 THE WITNESS: I forgot the page number.

10 Q. (BY MS. KLAHN) 39.

11 A. All right. I am there.

12 Q. And that this Fourth Methodology Order is the
13 final order signed by the Director; correct?

14 A. Yes, it appears to be.

15 Q. Okay. Now, I would like you to look through
16 the Fourth Methodology Order, Exhibit 306, and find the
17 paragraph where the Twin Falls Canal Company acres used
18 in the Fourth Methodology Order are identified. And I'm
19 not meaning to belabor the suspense. I can't find a
20 spot in there, which it is identified, which is why I
21 wanted you to look at it, and see if that's accurate?

22 A. I believe that that's accurate.

23 Q. Okay.

24 A. And that we started that table which was new
25 in the Fifth Amended Methodology Order of adding the

1 acres.

2 Q. Okay.

3 A. Generally, I think we add the acres, I can't
4 remember, it's either for each year in the April or the
5 July in the as-applied. They weren't in the fourth
6 amended, I believe.

7 Q. Okay. That's fair. All right. And so this
8 Fourth Methodology Order was signed by Director Spackman
9 in 2016. So by 2016, you were still using the 2013
10 shapefile number of 194,000 acres or so for Twin Falls
11 Canal Company; correct?

12 A. I believe, yeah, we were.

13 (Exhibit 325 marked.)

14 Q. (BY MS. KLAHN) Now, let's switch over and
15 take a look at Exhibit 325.

16 A. Yes I've got it.

17 Q. And could you identify Exhibit 325 for the
18 record, please?

19 A. It looks like a printout of a PowerPoint
20 titled "Proposed Modification to Method for Determining
21 Reasonable In-Season Demand for the Surface Water
22 Coalition: Use of the Near Real-Time Metric," Presented
23 by Ethan Geisler, Kara Ferguson, and Matt Anders, on
24 December 1st, 2022.

25 Q. And I apologize, these pages are not numbered,

1 but I believe it's page 19. There is a table that's
2 titled "Surface Water Coalition Irrigated Acres." Could
3 you find that, please?

4 A. I think I'm on that. The first table or the
5 first column is "SWC Member," and the last one is
6 "Methodology Acres"?

7 Q. Correct. Thank you.

8 A. Okay.

9 Q. So let's talk about each column for a minute.
10 So the first column is "SWC Member," as you said. The
11 second column is titled "Created by SWC for IDWR PPU."
12 What does that stand for?

13 A. It's the source of the shapefile. Whether it
14 was created by a Surface Water Coalition member or sent
15 to us, or it was created by us during the Snake River
16 Basin Adjudication. "PPU" stands for permissible place
17 of use.

18 Q. Then the next column, "Date of Shapefile,"
19 what does that tell us?

20 A. If it was submitted by the Surface Water
21 Coalition, it was the year that we received it. If it
22 was a permissible place of use, they all have a 2010.
23 That was my understanding of when they were created.

24 Q. Okay.

25 A. Or maybe last updated. Maybe not created, but

1 the last version.

2 Q. The next column is the "Shapefile Acres."
3 That's self-explanatory; would you agree?

4 A. Agreed.

5 Q. The next column is "If Remove Nonirrigated
6 Acres With 2011 Irrigated Lands Dataset." What does
7 that column represent?

8 A. I'm on a different table. I'm on "CDL
9 Processing Acres." Am I on the wrong one?

10 Q. Yeah, you are on the wrong one. And that's
11 probably my fault.

12 A. Well, wait. Three pages later, there is
13 another table.

14 Q. Let's do that one.

15 A. Okay. The same, and it says, "If Removed
16 Nonirrigated Acres with 2011 Irrigated Lands Dataset."

17 Q. Right. And so for purposes of the record, we
18 should be on page 22 of that exhibit, I think?

19 MR. FLETCHER: It was page 19.

20 MS. KLAHN: Is it page 19. It was correct.

21 Okay.

22 THE WITNESS: Okay.

23 Q. (BY MS. KLAHN) Sorry.

24 A. I was just -- I didn't count. I just went to
25 it.

1 Q. That's okay. That's all right. So let's
2 stick with that column. What does it stand for?

3 A. Those are the acres, if we did a GIS analysis
4 using the 2011 IDWR irrigated lands dataset, if we
5 removed all the polygons in the 2011 dataset. All that
6 area under the non-irrigated from the shapefiles that
7 they list here, either PPU or from the Surface Water
8 Coalition.

9 Q. Okay. And focusing on Twin Falls Canal
10 Company, if we look at the bottom row, the difference in
11 acres, the Surface Water Coalition's shapefile is
12 194,727. If you remove the non-irrigated acres with the
13 2011 irrigated lands dataset, it goes to 179,486; is
14 that right?

15 A. Correct.

16 Q. And then the next column over is titled, "If
17 Remove Non-Irrigated Acres with 2017 Irrigated Lands
18 Dataset." What does that tell us?

19 A. The same thing as we did with the -- or the
20 same process with the 2011 irrigated lands dataset. We
21 did it with the 2017 irrigated lands dataset.

22 Q. Okay. And then the final column is the column
23 that has been of acres that has been used in the
24 methodology order since the Fourth Methodology Order?

25 A. Yes, I think it's since the third. The third

1 came out in 2015.

2 Q. Okay.

3 A. I think that's what we've used those acres
4 since then, or Twin Falls specifically since then.

5 Q. Okay. And before we go on, let's just stop
6 for the record. What is the IDWR irrigated lands
7 dataset?

8 A. Jennifer was asked this same question. I
9 thought she gave a good answer. It is a -- hopefully, I
10 can give the same answer. It is a dataset that we
11 prepare here at IDWR. We use -- we prepare it by hand.
12 We use several different types of data to create
13 polygons on the Eastern Snake Plain, and then classify
14 them as irrigated, non-irrigated, or semi-irrigated.

15 Q. Okay. The Twin Falls Canal Company row that
16 we've been looking at shows two acreage numbers that are
17 derived from using the 2011 and 2017 irrigated lands
18 dataset that are roughly 13,000 acres smaller than
19 what's used in the methodology order; correct?

20 A. Yeah, roughly.

21 Q. And Ms. Sukow testified this morning that the
22 IDWR irrigated lands dataset is used to calibrate the
23 model. Were you aware of that?

24 A. I was aware of that, yes.

25 Q. And yet, during your deposition you testified

1 that you didn't think the irrigated lands dataset was
2 sufficient to satisfy the clear and convincing standard.

3 Do you recall that?

4 A. I do recall that.

5 Q. And in 2017, soon after, you issued the Fourth
6 Methodology Order, you had a brand-new irrigated lands
7 dataset. So why not incorporate that into the
8 methodology and use that instead of the larger shapefile
9 number?

10 A. So until -- so since about 2015, I haven't
11 been using the irrigated lands dataset at all. So it
12 wasn't a consideration when, in 2017, that I would use
13 that. I wasn't using one to remove the non-irrigated
14 acres. Which was an oversight on my part, because at
15 the same time I was doing that, I was working on the
16 near real-time metric and removing the irrigated
17 acres -- or the non-irrigated acres with the irrigated
18 lands dataset. So it was an inconsistency between
19 processes I had going.

20 Q. Would you agree the Department's hand
21 digitized maps that are created using the irrigated
22 lands dataset process are highly accurate?

23 A. I think they are highly accurate for the year
24 that they are created for.

25 Q. So in an ideal world, there would be a new

1 irrigated lands dataset every year, and that's what you
2 would use in the methodology order?

3 A. To use your term "ideal world," yes.

4 Q. And in the meantime, the dataset you are using
5 is at least ten years old. And you would acknowledge
6 that there is hardened acres incorporated in it; right?

7 A. Correct.

8 Q. So right now, the difference between the 2017
9 irrigated lands dataset and the methodology acres is
10 roughly, what; eight, nine percent difference?

11 A. Okay. Rough math, sure.

12 Q. Yes. At some point as the technical lead on
13 the methodology analyses, is there a threshold at which
14 you say, we simply can't use this 2013 dataset anymore
15 from Twin Falls, because it's simply too inaccurate
16 based on what our hand digitizing is showing?

17 A. Until we get something that passes, or that I
18 feel passes the, or achieves the clear and convincing, I
19 think we're going to use that. The clear and convincing
20 by Judge Wildman of, if you are going to reduce the
21 acres, you have to be clear and convincing.

22 Q. So the standard isn't really clear and
23 convincing, it's whether or not Judge Wildman has
24 blessed it; is that fair?

25 A. I don't know the answer to that.

1 Q. So for purposes of the Fifth Methodology
2 Order, have you done any investigations into Twin Falls
3 Canal Company return flows?

4 A. Not as part of the order.

5 Q. You had a conversation with Mr. Barlogi, who's
6 the manager of Twin Falls Canal Company, about their
7 return flows at some point, though; didn't you?

8 A. I don't think I've ever talked to him, that I
9 remember.

10 Q. About return flows and their impact on the
11 Murphy gage flows?

12 A. I stand corrected. As part of the Swan Falls
13 technical working group and work we were doing there, I
14 think -- I can't remember exactly. I may have sat in on
15 a call with Collin Macheel with Mr. Barlogi. I'm not
16 sure on that. I've talked to Collin several times about
17 return flows at Twin Falls. I can't remember if I sat
18 in on a call or not.

19 Q. Well, Mr. Barlogi testified he was on a call
20 with you in January of this year about Twin Falls Canal
21 Company return flows. And the timing to me was
22 interesting, because it was when the methodology order
23 was being, I guess, being drafted. So that's the source
24 of my question.

25 In your experience, have you evaluated whether

1 Twin Falls Canal Company return flows contribute to Swan
2 Falls gage flows -- or sorry -- Murphy gage flows?

3 A. Yes. And I think that's what that call was
4 about. As we were preparing data to present to the Swan
5 Falls Technical Working Group, that was going on at the
6 same time. We have calculated the contribution at the
7 Murphy gage for what they call the adjusted average
8 daily flow at Swan Falls.

9 Q. Let me ask you another question related to the
10 Twin Falls Canal Company.

11 MS. KLAHN: Let's mark this as Exhibit 362.

12 (Exhibit 362 marked.)

13 Q. (BY MS. KLAHN) So, Mr. Anders, you've been
14 handed Exhibit 362, which is a contract between the
15 Idaho State Board of Land Commissioners and Twin Falls:
16 Land & Water Company, dated January 2nd, 1903. And I'll
17 represent to you that this is the basis for one of Twin
18 Falls Canal Company's water rights. I would like you to
19 take a look in here at the section --

20 Well, first of all, have you ever seen this?

21 A. No.

22 Q. And so are you familiar with the fact that
23 this describes five-eighths of an inch delivery as the
24 basis for deliveries of water under the Twin Falls Canal
25 Company water right?

1 A. No.

2 MR. THOMPSON: Director, I'll object to this
3 exhibit. I guess we need inquiry that it represents the
4 water rights of the canal company. Those rights have
5 been decreed. And I think they are in the Department's
6 files.

7 THE HEARING OFFICER: Well, these questions
8 are foundational. I'll overrule the objection at least
9 for the moment, Ms. Klahn.

10 Q. (BY MS. KLAHN) So if you haven't seen this
11 contract before, you are not familiar with the fact that
12 there is a term in here that requires rotation of
13 deliveries at the Twin Falls Canal Company?

14 A. I'm not familiar with that.

15 Q. And so when you're doing your evaluations for
16 baseline year for the Twin Falls Canal Company, you
17 don't consider any of this kind of information; isn't
18 that right?

19 A. No.

20 MS. KLAHN: Okay. That's all I have.

21 I would like to move for admission of Exhibit
22 362, 325, and 324.

23 THE HEARING OFFICER: Any objection?

24 MR. THOMPSON: Yeah, I'll object to this
25 exhibit, again. Ms. Klahn, is characterizing it as

1 conditions of the water right, and how it should be
2 delivered. This is not the partial decree in the SRBA.
3 It doesn't have any sort of general provisions for
4 administration relating to this contract.

5 So what she's offering it for is a
6 mischaracterization of the water right that's been
7 decreed, in descriptive by the state laws.

8 MS. KLAHN: Mr. Director, if I may be heard?

9 THE HEARING OFFICER: Sure.

10 MS. KLAHN: We can before tomorrow morning,
11 produce the SRBA related documents relating to these
12 kinds of elements of the water right. Originally in
13 2012, I think it was, the City of Pocatello filed a
14 protest against the Twin Falls Canal Company claims in
15 the SRBA asserting the delivery be related to
16 five-eighths instead of three-quarters, some stuff
17 happened. We entered into a stipulation with Twin Falls
18 about the fact that this would not be decided in the
19 SRBA. That these were elements of administration.

20 So these are elements that we're asserting
21 should be taken into consideration, because they aren't
22 on the face of the partial decree, and that was by
23 agreement. And if you if you'd like to reserve, and
24 wait for something to be provided, we're happy to do
25 that.

1 MR. BUDGE: Just one comment.

2 THE HEARING OFFICER: Mr. Budge.

3 MR. BUDGE: Director, if you want to look at
4 the SRBA filing that Ms. Klahn is referring to, it's
5 Exhibit 179. And it's an SF5 filed with the SRBA court.
6 So it is the type of document that the Department would
7 typically take judicial notice of.

8 THE HEARING OFFICER: My reaction is this,
9 Mr. Budge, and, Ms. Klahn. I would take notice of the
10 decrees. I would take notice of the SF5. But do I take
11 notice of a contract document that's been presented to
12 me, that I know nothing about, and Mr. Anders knows
13 nothing about, and receive this into evidence. I mean,
14 it needs to have foundation. And Mr. Anders is not the
15 witness by, or through whom this document should be
16 presented.

17 So I'll receive into evidence exhibits marked
18 as Exhibits 324 and 325. And I won't allow what's been
19 marked as Exhibit 362 into evidence at this time.

20 MS. KLAHN: Thank you.

21 (Exhibits 324 and 325 received into evidence.)

22 THE HEARING OFFICER: It can be re-offered if
23 there is sufficient foundation, Ms. Klahn.

24 MS. KLAHN: Okay. Thank you.

25 MR. FLETCHER: So excuse me. You admitted 324

1 and what was the other one?

2 MS. KLAHN: 325.

3 THE HEARING OFFICER: 325.

4 MR. FLETCHER: Thank you.

5 THE HEARING OFFICER: They were presentations
6 by Matt Anders to the Surface Water Coalition technical
7 working group.

8 Mr. Budge?

9 MR. BUDGE: One housekeeping item, did Exhibit
10 306 get admitted into evidence?

11 THE REPORTER: No, I don't have it.

12 MS. KLAHN: I misunderstood, Mr. Fletcher. I
13 thought he said it had been used and admitted. So I'll
14 offer Exhibit 306 as well.

15 THE HEARING OFFICER: So 306 is being offered
16 as 306, not as a combined exhibit?

17 MS. KLAHN: Yes.

18 THE HEARING OFFICER: Any objection to the
19 admission of Exhibit 306?

20 Hearing no objection, the document marked as
21 Exhibit 306 is received into evidence.

22 (Exhibit 306 received into evidence.)

23 THE HEARING OFFICER: Further examination of
24 Mr. Anders?

25 Mr. Anderson.

1 ///

2 CROSS-EXAMINATION

3 QUESTIONS BY MR. ANDERSON:

4 Q. How are you doing, Matt?

5 A. Good. Thank you.

6 Q. You should have the methodology order exhibit.

7 Is that still in front of you, 300?

8 MR. FLETCHER: 301.

9 Q. (BY MR. ANDERSON) 301.

10 A. 301.

11 THE HEARING OFFICER: I think it's 300; isn't
12 it?

13 MR. ANDERSON: I thought it was 300.

14 MR. FLETCHER: You mean, the Fifth
15 Methodology?

16 MR. ANDERSON: I'm sorry. Yes, the Fifth
17 Methodology. The As-Applied is 301.

18 MR. FLETCHER: Yes.

19 THE WITNESS: Yes, I have 300.

20 Q. (BY MR. ANDERSON) Would you go to paragraph
21 9, and it kind of goes on to page 4 there. I am more
22 curious about the last two sentences there. It says it
23 starts with "an above average diversion year."

24 A. On page 4. Okay.

25 Q. Yeah. At the top of page 4.

1 A. Yes, I see it.

2 Q. Would you mind just reading that sentence for
3 us?

4 A. Sure. "An above average diversion year or
5 years selected as the baseline year should also
6 represent a year or years of above average temperatures
7 and reference ET, and below average precipitation to
8 ensure that increased diversions were a function of crop
9 water need and not other factors."

10 Q. Could you help me understand what those other
11 factors might be?

12 A. I'm not sure.

13 Q. Okay. So then is it safe to conclude that an
14 above average diversion year wouldn't matter whether it
15 was above average temperatures, if they divert, they
16 divert? If you cannot identify what other factors it
17 might be, why does it need to be above average
18 temperatures?

19 A. Well, I don't quite understand the question.

20 Q. Well, I'm just trying to understand the
21 methodology order as it's stated. It gives the list of
22 factors in choosing the baseline year. And it says "to
23 ensure that the increase in diversions were from a crop
24 water need and not other factors." I don't know either.
25 I'm trying to understand what those other factors are?

1 But I've asked and answer -- I'm not trying to put you
2 on the spot and make you come up with an answer. If you
3 don't know what those other factors are, that's fine.

4 A. Okay.

5 Q. Do you believe there are other factors without
6 naming them?

7 A. Not that I can think of.

8 Q. Okay. Let's go to paragraph No. 28.

9 A. On page 12, correct?

10 Q. Yes. Okay. There is a quote here at the end
11 of 28. And I'll read it this time. I won't put
12 everything on you. It says, "The concept of a baseline
13 is that it is adjustable as weather conditions or
14 practices change, and that those adjustments will occur
15 in an orderly, understood protocol." Are you with me on
16 the same --

17 A. I did see that sentence. Yes.

18 Q. So I have a question. Did weather conditions
19 change in the last seven years to prompt a change in the
20 baseline year?

21 A. I don't think significantly.

22 Q. Did practices change?

23 A. I think the crop mix, crop type, and maybe
24 some harvesting methods may have changed in that time.

25 Q. Okay. And maybe you can just direct me, which

1 part of the methodology order looks specifically at that
2 crop mix and --

3 A. The crop mix is part of the crop water need
4 calculation.

5 Q. Okay. Do you calculate the change in that
6 crop water need, and evaluate it as a requirement to
7 update the baseline year?

8 A. Could you restate that question?

9 Q. Sure. Sure. Maybe I can rephrase it and give
10 a little foundation for it.

11 The concept of baseline year as it says, it's
12 adjusted as whether conditions change or practices
13 change. So my question is, do you evaluate the crop
14 water need and determine these practices changes?

15 A. We are evaluating the crop water need. We are
16 also over time watching, especially over the last few
17 years, watching the baseline year to see if it still
18 meets the criteria.

19 Q. Understand. And could you explain just the
20 orderly and understood protocol for changing a baseline
21 year?

22 A. The only way a baseline year could be changed
23 is through an order issued by the Director.

24 Q. The crop water need that you are talking about
25 that you say, the practices changes would show up in the

1 crop water need; is that correct?

2 A. They can.

3 Q. They can?

4 A. Yeah.

5 Q. Is there any other way that they could be
6 manifested?

7 A. I think changes in crop type or crop mix that
8 are being grown can show up in diversion. It can show
9 up in project efficiency. These are all pieces that
10 we're calculating.

11 Q. But you don't look specifically for changes in
12 practice, those will just show up as a difference in
13 efficiency; correct?

14 A. Yeah, we're not specifically tracking -- I
15 think I see now. We're not specifically tracking what
16 are their harvesting practices or things like that. We
17 are watching the crop. We do calculate the crop mix.
18 But you are right, that changes in practices, we would
19 only see like the secondary effect of that. It would
20 show up in some kind of number that we're calculating.

21 Q. I want to talk to you a little bit. I'm kind
22 of confused about the clear and convincing standard that
23 you apply to the crop water acres --

24 A. Yes.

25 Q. -- or the irrigated acres? Sorry. Not a

1 crop water acres.

2 A. Yes.

3 Q. What data, I guess, that you would consider
4 needs to meet that clear and convincing standard?

5 A. I think it has to -- the data have to be
6 timely and accurate. And when I say "timely" --

7 THE HEARING OFFICER: Go ahead.

8 THE WITNESS: When I say timely, to use a term
9 used by Ms. Klahn, is it would be really nice to have it
10 in-season, but that's impractical.

11 Q. (BY MR. ANDERSON) Okay.

12 A. So as soon as we could get, you know,
13 something recent. That's what I mean by timely.

14 Q. Not to nitpick you. That's still a different
15 standard than clear and convincing. I'm trying to
16 understand the clear and convincing standard that you
17 apply to the irrigated acres. You said it wasn't clear
18 and convincing. Maybe you could explain what part of
19 the study that the Department did was unclear first?

20 A. You are talking the 2017 irrigated lands
21 dataset?

22 Q. Yes, I believe that's what Ms. Klahn was
23 talking about when you gave that answer.

24 A. Okay. So the part of that to me is that was
25 created in 2017. So while it has the accuracy, I think

1 the timeliness of that dataset does not meet the
2 standard of clear and convincing. You can open that
3 dataset and see acres that are considered non-irrigated.
4 Overlay it on a recent air photo, maybe a 2021 or
5 something a 2022, and see that it is irrigated.

6 So to me, that's not convincing that those
7 acres should be removed. They said in the 2017, that
8 dataset indicates that they should be removed. But if
9 we look at recent air photos. It shouldn't be. They
10 are irrigated.

11 Q. And the Department has done those studies,
12 recent studies of irrigated acres?

13 A. It was just a preliminary analysis to see what
14 does it look like compared to current conditions, the
15 2017. So we did not do a full-blown project or analysis
16 of it. It was more of a preliminary.

17 Q. And with that study, did you find acres that
18 were considered irrigated back then, but are no longer
19 appearing to be irrigated acres?

20 A. I didn't identify any, but I would say it's
21 likely that there are exactly that.

22 Q. Is there any other data or evidence that you
23 think needs to meet a clear and convincing standard that
24 you did not consider in this methodology order, because
25 it did not meet that standard?

1 A. Can you repeat that question?

2 Q. That was a little bad. I'll take that.

3 Is there any data or information that you
4 didn't consider as part of this methodology order,
5 because you felt it didn't reach that clear and
6 convincing standard?

7 A. I think that the supplemental ground water is
8 the same, is in the same category that to adjust the
9 acres downward, it needs to be clear and convincing.

10 Q. Okay. But all the other data that you used,
11 you felt was clear and convincing?

12 A. I'm not sure that that standard is applied to
13 everything. When Judge Wildman, at least the piece that
14 I have read, was talking about irrigated acres, not the
15 methodology as a whole.

16 Q. Okay. I understand. I want to talk a little
17 bit maybe about the recommendations.

18 (Exhibit 914 marked.)

19 Q. (BY MR. ANDERSON) This is Exhibit 914. You
20 know, I don't know that we even need to take the time to
21 even get it out. I'm going to reference it. 914, I'll
22 represent was the recommendations in December that the
23 Department made. It was a one-page document. You are
24 familiar with that; correct?

25 A. For the technical working group?

1 Q. Yes.

2 A. Yes, I am familiar with that. Yes.

3 Q. Yes. And that didn't recommend a move to
4 transient; correct?

5 A. No, it did not.

6 Q. And if you need to look at it for reference,
7 you can. But that's all I'm going to touch on it.

8 A. No, it did not.

9 Q. When did it first become evident to you, that
10 the new methodology order, the Fifth Methodology Order
11 was going to move to transient?

12 A. The official time is when the Director signed
13 it.

14 Q. All right. Now, I understand that there may
15 have been discussions. But when do you, for example, I
16 assume you saw drafts of the order prior to it being
17 signed and released?

18 A. Yes, correct.

19 Q. When did you first see a draft of the order
20 that switched to transient?

21 A. The first draft of the order that I saw was
22 sometime in late January. I can't remember if that
23 draft had proposed language to move to transient. But
24 at that time that the draft was given to technical
25 staff, to Jennifer and Kara and I, so soon after. If it

1 didn't have it at that point, late January, it would
2 have had it soon after. We were editing it actively at
3 that point.

4 Q. And did you from your edits from that draft,
5 did you add in the language regarding the move to
6 transient?

7 A. No, that would have been Jennifer Sukow.

8 Q. Okay. But in a draft that you returned to the
9 Director, did that have the language showing a move to
10 transient?

11 A. Yes, there would have been -- I don't know the
12 timing of it exactly, but it -- when we would have given
13 him drafts that had that recommendation in it, or
14 proposed language in it for that.

15 Q. Were you aware of any settlement negotiations
16 going on between the Surface Water Coalition and ground
17 water users at the time the Fifth Methodology Order was
18 being prepared?

19 A. I don't remember if there were negotiations
20 going on. I remember that there was some through the
21 summer. And I thought they ended in the fall, but
22 that's what I remember.

23 MR. FLETCHER: I'm going to object. I don't
24 know the relevancy of that question to this proceeding.

25 THE HEARING OFFICER: Sustained.

1 Q. (BY MR. ANDERSON) I'm going to wrap it up
2 here pretty soon. Can we go back to the methodology
3 order, No. 300?

4 A. Okay. I have it.

5 Q. We're going to go to paragraph 30.

6 A. On page 13?

7 Q. Yes. I kind of want you just to walk me
8 through a process, if you can. On paragraph 30, it
9 references a Q sub D. How do you refer to that
10 internally. Do you just say, "QD"?

11 A. We just call it diversions. But what it is
12 discharge from diversions. The "Q" is discharge. And
13 the "D" indicates it's from diversions.

14 Q. Okay. When you look at it, though, I
15 appreciate your reference to calling it diversions. But
16 it's actually a specific type of diversions; correct?
17 You could look right above paragraph 30 if you --

18 A. It says above it, "QD" is defined as
19 "irrigation entity diversion of water specifically put
20 to beneficial use for the growing crops within the
21 irrigation entity."

22 Q. So there is a slight difference in QD than
23 just diversions; correct, or does the Department see no
24 difference?

25 A. I think there is a difference. Here we are

1 referring to their entire diversions, the seepage loss,
2 everything. What they diverted at their headgates.

3 Q. Okay. And that's how the Department sees QD
4 is just diversions?

5 A. In the methodology?

6 Q. Yes.

7 A. Elsewhere? I don't know.

8 MR. ANDERSON: I don't think I have any
9 further questions.

10 THE WITNESS: Okay.

11 THE HEARING OFFICER: Thank you, Mr. Anderson.

12 MR. ANDERSON: Thank you.

13 THE HEARING OFFICER: Further questions of
14 Mr. Anders?

15 Mr. Harris.

16 CROSS-EXAMINATION

17 QUESTIONS BY MR. HARRIS:

18 Q. Mr. Anders, my name is Rob Harris. I
19 represent the City of Idaho Falls. I don't think we've
20 met before. But in the list that was read by Mr. Wood
21 earlier. I understand that you are the person that the
22 Department is designated to testify about the forecast
23 supply; is that right?

24 A. You are correct.

25 Q. Okay. And you have in front of you Exhibit

1 300, which is the Fifth Methodology Order?

2 A. I do.

3 Q. Could you turn to page 18 for me?

4 A. What page?

5 Q. Page 18, paragraph 49?

6 A. Did you say, paragraph 49?

7 Q. Yes.

8 A. Okay. I'm there.

9 Q. Okay. As I understand the order when the
10 Department or the Director looks at the forecast supply,
11 he is looking at a prediction of the unregulated inflow
12 volume at the Heise gage as of April 1st; is that right?

13 A. Yes.

14 Q. Okay. And that forecast is prepared by who?

15 A. We get that forecast from the Bureau of
16 Reclamation, who does a joint -- what they call the
17 joint forecast, with the Army Corps of Engineers.

18 Q. Okay. And Heise gage is generally located
19 where on the Snake River; do you know?

20 A. It's located by Palisades. I don't know the
21 exact mile, how many miles, but between Palisades and
22 Idaho Falls generally speaking.

23 Q. So it's predicting the inflow in the watershed
24 above that gage; correct?

25 A. The unregulated flow means if there were no

1 reservoir operations going on, how much would be there,
2 so, yes.

3 Q. Are you familiar with some of the other
4 watersheds of the tributary streams or basins in eastern
5 Idaho?

6 A. A little familiar.

7 Q. Are you familiar with the Willow Creek
8 drainage?

9 A. Somewhat.

10 Q. Okay. It's the drainage where Ririe Reservoir
11 is located. How about the Blackfoot River drainage.

12 A. Not as familiar with that one.

13 Q. Okay.

14 A. But I know roughly where it is.

15 Q. The Blackfoot River comes below where the
16 Heise gage would be; would you agree with that?

17 A. I believe it comes in from the east.

18 Q. The same with Willow Creek?

19 A. Yes, I believe my geography is right. They
20 both come in from the east below Heise.

21 Q. Also the Portneuf River drainage; correct?

22 A. More familiar there. It comes in from the
23 southeast, but also -- yes.

24 Q. And those are all tributary streams to the
25 Snake River; correct?

1 A. I believe so, yes.

2 Q. And what is the source of the water right for
3 the Twin Falls Canal Company; do you know?

4 A. The Snake River.

5 Q. The Snake River. And so these tributary
6 basins come in above Twin Falls Canal Company's points
7 of diversion; do you agree?

8 A. Yes.

9 Q. Okay. Are you familiar with the snow water
10 equivalency maps that the Department posts routinely
11 during the non-irrigation season?

12 A. Yes, I am.

13 Q. Okay. How are you familiar with those?

14 A. They are prepared by the NRCS. We take their
15 data, and we create maps. And then we post it on our
16 web page.

17 Q. And were you aware on the snow equivalency map
18 for April 3rd, that the percentage snow pack in the
19 Portneuf basin was 216 percent?

20 A. I knew it was very high. I didn't know the
21 exact number.

22 Q. Did you know in the Blackfoot River drainage,
23 it was at 186 percent?

24 A. Again, I knew it was high, not the exact
25 number.

1 Q. The same for Willow Creek at 178 percent?

2 A. Again, I knew it was high, but not the exact
3 number.

4 Q. Was there ever any discussion within the
5 Department to look at these other basins, in addition to
6 the unregulated flow at Heise, forecast as part of the
7 water supply to the Surface Water Coalition?

8 A. We didn't have any discussions about adding
9 them to our regressions or adding them some way to the
10 joint forecast, no.

11 Q. But you would agree, it would provide water to
12 the water supply of the Twin Falls Canal Company;
13 correct?

14 A. Among others. They can supply water to the
15 reservoirs. They can supply water to anybody below
16 there that's in priority. But Twin Falls is among those
17 water users.

18 Q. And the Portneuf River, for example, flows
19 directly into American Falls Reservoir; correct?

20 A. Yeah, uh-huh.

21 Q. But that wasn't considered in the revised
22 methodology order at all looking at anomalous snow pack
23 situations and tributary basins?

24 A. No, we didn't do any review like that.

25 Q. In paragraph 49, there is also some discussion

1 about shifting one, was it one standard deviation in the
2 forecast supply? Did I understand that correctly?

3 A. We calculate the supply. And then shift it
4 down by one standard deviation, yes.

5 Q. Is that something that you recommended to be
6 done?

7 A. That method was developed around 2014 or '15.
8 My best guess is that was recommended by Liz Cresto.

9 Q. I'm sorry. Who is that?

10 A. Liz Cresto was formerly a hydrologist with
11 IDWR, and she worked on the methodology. And her
12 portion, or the portion she worked on was the forecast
13 supply.

14 MR. HARRIS: I have no further questions.
15 Thank you.

16 THE WITNESS: Thank you.

17 THE HEARING OFFICER: Thank you, Mr. Harris.

18 Further questions of Mr. Anders?

19 Mr. Budge.

20 CROSS-EXAMINATION

21 QUESTIONS BY MR. BUDGE:

22 Q. Thank you. Mr. Anders, I'm TJ Budge. I
23 represent IGWA. Do you mind if I call you Matt today?

24 A. Sure, that would be great.

25 Q. All right. Matt, I want to follow up with

1 just some questions that Mr. Harris asked that piqued my
2 curiosity. And maybe I didn't follow that. But I think
3 I understood that the forecast supply, the joint
4 forecast that goes into the forecast supply does not
5 take into account inflows from the Portneuf or Blackfoot
6 River basin?

7 A. That forecast is prepared by the Bureau of
8 Reclamation and the Army Corps of Engineers. I'm not
9 familiar with everything that they consider, or how they
10 calculate it. But my understanding it's the flow,
11 unregulated flow at Heise.

12 Q. Okay. So I want to ask a few follow-up
13 questions. If that forecast doesn't take into account
14 the Portneuf, or, you know, the Blackfoot River basins,
15 is there anything else in the methodology that would
16 account for the inflow from the Portneuf on a year like
17 this?

18 A. I'm unsure what you mean by "account for."

19 Q. Are you aware that the Portneuf River basin
20 had record snow pack this winter?

21 A. I knew it was high, yes.

22 Q. Yeah. And I'm from Pocatello, so this is, you
23 know, close to home. But are you aware of the flooding
24 that's been going on there for the last month or so?

25 A. I was not.

1 Q. Well, I'll just represent that the Portneuf
2 had the highest snow water equivalent in Idaho this
3 year. And it was record for the Portneuf basin. And
4 there has been flooding for the last month in the lower
5 Portneuf basin.

6 And so my question is, do you know if there is
7 anything in the methodology order that would take into
8 account that excess inflow on a year like this, that's
9 coming in from the Portneuf?

10 A. We don't do an adjustment, or something on the
11 forecast -- or on the joint forecast.

12 Q. Okay. And it's a genuine question, because I
13 don't know that either. But I appreciate your answer.
14 If there is no adjustment, then, you know, the record
15 inflow or excess inflow would that become a windfall to
16 the Surface Water Coalition or be accounted for in some
17 other way?

18 MR. THOMPSON: I'll object to the form of the
19 question.

20 THE HEARING OFFICER: Overruled.

21 THE WITNESS: I don't know about a windfall
22 for Twin Falls Canal Company. It would be captured and
23 delivered like any other tributary, or captured in the
24 reservoirs. It would become part of the water supply.
25 Who's going to benefit from that? It depends on which

1 reservoir is filling, what space is filling, who's in
2 priority.

3 Q. (BY MR. BUDGE) Fair enough. Let me move back
4 to the questions I had planned on asking you. But I
5 appreciate that explanation. That's helpful. I will
6 try not to duplicate questions that others have asked.

7 I understand that you have worked on prior
8 versions of the methodology order?

9 A. I worked on the Third and the Fourth, yes.

10 Q. Okay. And then in respect to reviewing the
11 Fourth and preparing the Fifth, you are the lead
12 Department staff member overseeing the technical aspect
13 of that review?

14 A. Yes.

15 Q. My understanding is that you took directions
16 from the Director in terms of which analyses to perform.
17 And then you would make those assignments to Jennifer
18 Sukow and other staff members to perform those analyses?

19 A. Definitely took direction from the Director
20 about what he wanted us to look at. When we started the
21 review, I was not either directly or indirectly
22 supervising Jennifer. I was supervising Kara.

23 Q. Okay. And your review began in the summer of
24 2021?

25 A. We started reviewing in 2020.

1 Q. 2020.

2 A. Fall of 2020, that check-in review on it, on
3 the methodology.

4 Q. And that continued through 2021 and then into
5 '22, until the Director's assignment in August of '22
6 that he was going to proceed with amending the
7 methodology order?

8 A. Not continuous. We worked for a few months
9 reviewing it, and presenting our results to the Director
10 between maybe October and February -- October 2020 and
11 February 2021. And then we, Kara and I may have been
12 working a little bit on our own, individually.

13 But there was no formal kind of check-in
14 review going on, until fall of 2022, or I should say,
15 late summer, when we started talking about it again. We
16 had been talking about it on and off in there, but
17 that's when in August, that's when the Director issued
18 we needed to convene the technical working group.

19 Q. What components of the methodology did you
20 work on in the fall of 2020, and then into the winter of
21 2021?

22 A. Originally we were looking at baseline year,
23 we were looking at forecast supply, and we were looking
24 at near real-time metric.

25 Q. And I understand that a main impetus for

1 reviewing the Fourth Methodology Order was just the
2 passage of time, and additional data that had been
3 developed since 2016?

4 A. That was part of it. We were also -- one of
5 the variables that we used for forecast supply is Box
6 Canyon at after -- we issued the Third Methodology Order
7 in 2015. And then the USGS did a shift on that gage
8 that spring. And we were unsure about what that did to
9 our regression that we were using for forecast. So we
10 have been -- we had been watching that on and off for
11 years.

12 In 2020, we became concerned again about is
13 Box Canyon performing the way we want it to? And then
14 the passage of time on the baseline year, was that still
15 meeting all the criteria?

16 Q. And Box Canyon is part of the regression
17 equation used to predict forecast supplying?

18 A. It is. Not for all the companies, but
19 specifically it is for Twin Falls Canal Company, which
20 is the one that has the first shortfall. So we watch
21 that closely.

22 Q. Okay. And the deterioration in that
23 regression equation in the R-squared value was one of
24 the impetuses for reviewing the Fourth Methodology Order
25 then?

1 A. Yes, that's an indicator of, is the regression
2 performing the way we want it to be?

3 Q. Okay. So there wasn't some type of emergency
4 circumstance that forced the Department to review the
5 Fourth Methodology Order?

6 A. Not that I remember.

7 Q. Okay. You participated in the August 5th,
8 2022 status conference, where the Director announced
9 publicly that the Department was going to review the
10 Fourth Methodology Order?

11 A. Yes, I was present.

12 Q. And do you recall from that, that I raised a
13 concern about how this proceeding would comply with due
14 process?

15 A. I remember you talking. I don't remember what
16 you said.

17 Q. It must not have been that memorable.

18 A. Sorry.

19 Q. Are you aware that there was subsequent
20 correspondence between myself and Garrick Baxter about
21 holding a hearing, and complying with due process in the
22 Administrative Procedures Act?

23 A. No, I'm not aware.

24 Q. Was there any discussion among technical staff
25 as to whether the Department would hold a hearing before

1 or after issuing the Fifth Methodology Order?

2 A. Say that again. Please repeat that question?

3 Q. Yeah. Was there any discussion among the
4 Department staff, about whether the Department would
5 hold a hearing before or after issuing the Fifth
6 Methodology Order?

7 A. I hate to do this again. When you say
8 "hearing," were you talking about on the Fifth
9 Methodology Order, or were you still talking about the
10 August 5th? I'm confused which one you are talking
11 about. A hearing for each one?

12 Q. I apologize for not asking clear questions.
13 So the hearing we're holding today on the Fifth
14 Methodology Order. Was there ever any discussion as to
15 whether an evidentiary hearing would be held before,
16 versus after the Fifth Methodology Order was issued?

17 A. Not with me.

18 Q. Okay. Let me ask you to turn to Exhibit 914.
19 In fact, you don't need to turn to it. This is the
20 preliminary recommendation document that you and Kara
21 Ferguson authored?

22 A. Yes.

23 Q. You are very familiar with that.

24 A. Yes.

25 Q. That document is titled a recommendation

1 concerning the Fifth Methodology Order. Ultimately, was
2 that a recommendation to the Director?

3 A. Yeah, I believe that is. It's from Kara and I
4 to the Director.

5 Q. Okay. And did the Director contribute to
6 reviewing and editing that recommendation before it was
7 published?

8 A. Yes.

9 Q. That's dated, I think, was it December 23rd?
10 What's the date on that?

11 A. That sounds familiar. It was right before
12 Christmas. Yeah.

13 Q. And that followed the technical working group
14 presentations that were made in November and December;
15 correct?

16 A. Yeah. I think the last technical working
17 group meeting was about a week before that.

18 Q. Okay. So as of the time of that
19 recommendation, all of the technical presentations to
20 outside consultants had been completed?

21 A. Yes.

22 Q. And we heard Jennifer this morning testify
23 that she didn't really do any modeling related to the
24 Fifth Methodology Order, you know, after our technical
25 presentation was made; is that correct?

1 A. I don't know.

2 Q. Okay. Had the technical review of the Fourth
3 Methodology Order essentially been complete by the time
4 you issued the December 23rd recommendation document?

5 A. I would call the preliminary was complete.
6 That's what I would call that. There was additional
7 review. And as we were drafting the order, talking
8 about different aspects of it, and things changed. So I
9 would say that's more of kind of like the preliminary
10 portion was done.

11 Q. Was the subsequent review a discussion of the
12 technical work that was presented in November or
13 December, or did the Department continue to perform
14 additional analyses that, you know, had not been
15 presented in November, December?

16 A. I don't think there were -- there were
17 additional analyses that we worked on after the
18 technical working group.

19 Q. What did those consist of?

20 A. The ones that I remember the most, were
21 centered around reasonable carryover. When we presented
22 that to the technical working group, we actually
23 realized about halfway through the technical working
24 group, that we hadn't planned on modifying reasonable
25 carryover. But then we realized, or I realized that the

1 baseline year is part of that calculation. So that we
2 were going to have to take a look at reasonable
3 carryover.

4 And we -- that was during the technical
5 working group. So the way that I presented it there
6 was, if we just inserted the 2018 baseline year in the
7 reasonable carryover calculation. Here's what
8 you -- here's the results. And here would be the impact
9 on how often we would have a reasonable carryover
10 shortfall.

11 After we got the comments, and after we were
12 into the drafting, we started doing additional analyses
13 looking at the reasonable carryover.

14 Q. Okay. Was there an updated PowerPoint
15 presentation or some other type of report that reflected
16 the additional carryover review that you conducted?

17 A. No, we did not send anything out.

18 Q. Okay. Was there something generated
19 internally within the Department, or was it more just
20 verbal discussions?

21 A. There were several meetings. There were
22 proposed drafts, or proposed language in the order,
23 conversations about it. And then ultimately, what our
24 final decision is in the order.

25 Q. Understood. Any other components of the

1 methodology that you continued to conduct additional
2 analyses on after December 23rd?

3 A. I can't remember the date on the email. Kara
4 sent -- Kara Ferguson sent out some additional analysis
5 about kind of follow up for additional variables on the
6 forecast supply. I want to say that came out late
7 December, after that summary.

8 Q. Okay.

9 A. But that was to the technical working group,
10 mailed out to everybody.

11 Q. So that email went to the folks that were
12 invited to those November, December technical working
13 group --

14 A. Correct. Everybody that was on our list that
15 we sent everything to, that would have gone out to all
16 of those.

17 Q. Okay.

18 A. I can't remember the date on it, but I think
19 it was after the 23rd, when that went out.

20 Q. Okay. So other than the email that you just
21 mentioned that Kara sent out, and the additional
22 carryover analysis. All the other technical work had
23 essentially been completed by the end of 2022?

24 A. I think on irrigated acres, based on input
25 from the technical working group, I calculated -- I

1 think I did some additional work on the irrigated acres
2 to calculate what they would be, with the new
3 shapefiles, and like the 2023 shapefiles. So I had to
4 do some additional work there. I also worked on Milner,
5 which is why we released that one.

6 Q. Got you. When you say the 2023 acres, is that
7 based on the acreage that the Coalition reported in 2023
8 under Step 1 of the methodology?

9 A. Yeah.

10 Q. Okay.

11 A. We received a new shapefile. And I -- for
12 Minidoka. And I recalculated the acres for Milner.

13 Q. Okay. And Twin Falls Canal reported the same
14 acreage in '23 as they have since 2013; correct?

15 A. They sent us a letter. I don't remember if
16 the acreage is in that letter, or if they just say it
17 hasn't changed five percent from our previous year. I'm
18 not sure of that.

19 Q. Okay. You didn't go run the methodology based
20 on the other acreage figures for Twin Falls that were
21 discussed earlier today? And what I mean by that, I'll
22 clarify. Is in the technical working group presentation
23 where it shows the irrigated lands, dataset acres, and
24 the metric acres that were around 179,000 or 180,000.
25 You didn't run the methodology based on those acreage

1 figures?

2 A. No, I used the 194 number for the methodology.

3 Q. Okay. Thank you.

4 (Exhibits 915 and 916 marked.)

5 Q. (BY MR. BUDGE) Let me have you open the
6 common exhibits binder, and turn to Exhibits 915 and
7 916.

8 A. So, yep, I'm on 915.

9 Q. And is 915, the comments that Sophia Sigstedt
10 with Lynker Technology submitted to the technical
11 working group, I think that was January 16th?

12 A. Yeah, they are from Heidi Netter and Greg
13 Sullivan, 915.

14 Q. I've got those backwards. So 915 are the
15 comments from Spronk Water Engineers?

16 A. That's what I have.

17 Q. Okay.

18 A. Yep.

19 Q. And then 916 are the comments from Sophie
20 Sigstedt with Lynker Technology?

21 A. Yep, that's true.

22 Q. Are you familiar with those documents?

23 A. Yes, I am.

24 Q. Just describe briefly what those are?

25 A. So these are the comments provided. 915 is

1 the comments by Spronk Water Engineers related to the
2 information that we presented in the technical working
3 group and the summary. And the same is true for 916,
4 but this one is from Sophia Sigstedt of Lynker
5 Technology.

6 Q. Thank you. And these comments were solicited
7 by Department staff as part of the technical working
8 group process?

9 A. Yeah, they were.

10 Q. And they were kept by the Department, among
11 its records, considered in connection with developing
12 the Fifth Methodology Order?

13 A. Yes, we reviewed them in our process.

14 MR. BUDGE: I would move to admit Exhibits 915
15 and 916.

16 THE HEARING OFFICER: Any objection to the
17 admission of these documents?

18 With no objection -- well, it seems odd to me
19 that they are coming in through Mr. Anders, and not the
20 experts, themselves, who will testify. But they are the
21 documents marked as Exhibits 915 and 916 are received
22 into evidence.

23 (Exhibits 915 and 916 received into evidence.)

24 Q. (BY MR. BUDGE) Matt, did you review those
25 documents when they came in?

1 A. Yes.

2 Q. And did you communicate those to the Director,
3 and bring to his attention the issues raised in those
4 documents?

5 A. Yeah, we did.

6 Q. Let me shift gears back to a discussion we had
7 a moment ago about forecast supply. And we talked about
8 the degradation of the regression equation used for Twin
9 Falls Canal Company.

10 My understanding is that the forecast supply
11 for Twin Falls Canal was based on a regression analysis
12 comparing natural flow of the Snake River near Heise to
13 the natural flow diverted by each Surface Water
14 Coalition entity; is that accurate?

15 A. I think there is an additional variable there,
16 predictor. I think it's Box Canyon. I would have to
17 look at the -- for Twin Falls Canal Company, I would
18 have to look at the order to make sure.

19 Q. Okay. Can you just summarize their regression
20 equation as you understand it, utilized to predict Twin
21 Falls Canal Company's forecast supply?

22 A. I think it's the unregulated flow at Heise.
23 And I think November through March flow at Box Canyon is
24 the other variable.

25 Q. Okay. And you mentioned that one of the

1 reasons that the Department undertook a review of the
2 Fourth Methodology Order is due to concerns with the
3 reliability of that predictive tool?

4 A. Yes. Is that tool, or is that regression
5 accurate still.

6 (Exhibit 103 marked.)

7 Q. (BY MR. BUDGE) Okay. If you'll turn to
8 Exhibit 103. That's in one of the binders of IGWA's
9 exhibits.

10 A. 103 for me is the 2015 technical memo from Liz
11 Cresto and I, to the Director.

12 Q. That's correct. Thank you. I'm sure you
13 recognize this document, since you are one of the
14 authors?

15 A. Yep, I recognize it.

16 Q. Just explain briefly what this document is?

17 A. So in two-thousand- -- I think all the
18 meetings were in 2015. We held a series of technical
19 working group meetings with the consultants and
20 representatives of the parties. And we talked about
21 several topics. And based on those, or kind of
22 that -- those meetings, Liz and I wrote this technical
23 memo to the Director.

24 In addition to this technical memo, I think
25 attached to it, were comments if the consultants of the

1 different parties wanted to submit comments, that we
2 attached them to this. And I believe they all did. I
3 can't remember.

4 Q. I believe they may be attached.

5 A. Yes.

6 Q. Okay.

7 A. I see them attached here.

8 Q. If I look at the introductory paragraph at the
9 bottom of that, it identifies three specific issues that
10 the Director had tasked Department staff with
11 evaluating. And Issue No. 1 is "Revising the natural
12 flow forecast methods for Twin Falls Canal Company."

13 Can you explain what was going on at that
14 time, and why Department staff had been tasked with
15 analyzing this?

16 A. I don't remember exactly why we were tasked
17 with that. But in the fall of 2014, we received a court
18 ruling that listed several things that we had to adjust
19 or look at in the methodology. This may have been one
20 of them.

21 Q. Okay.

22 A. I don't remember.

23 Q. So does the simple fact that that action item
24 was being assigned for review and improvement, indicate
25 that there were some concerns with the reliability of

1 the natural forecast methods that had been used at that
2 time?

3 A. I'm not sure. But I would expect that there
4 was some concern with the way we were doing it.

5 Q. But you don't remember whether there was
6 concerns with that at that time or not?

7 A. I don't at that time.

8 Q. Okay. Has the Department had concerns with
9 Twin Falls' forecast regression for some time now?

10 A. We've been concerned about it, I'll speak,
11 since 2015, since we issued the Third Methodology Order.
12 We've been concerned and monitoring that forecast.
13 We're seeing a degradation or a downward decline in the
14 R-squared for that one.

15 (Exhibit 901 marked.)

16 Q. (BY MR. BUDGE) Let me have you turn next to
17 Exhibit 901.

18 A. Okay. I have that, 901.

19 Q. So I'll read the title "Evaluation of Method
20 for Determining Material Injury to Reasonable In-Season
21 Demand and Reasonable Carryover: April and July
22 Forecast Supply," presented by Kara Ferguson, dated
23 November 17th, 2022. Is that the one you are looking
24 at?

25 A. I am.

1 Q. Do you recognize that document?

2 A. Yep, I do.

3 Q. Is that a copy of the presentation that
4 Ms. Ferguson gave to the technical working group this
5 last November of 2022?

6 A. I didn't memorize the presentation, but it
7 does look like the slides that she gave.

8 Q. Okay. If you'll turn to page 9 of that
9 exhibit?

10 A. Yep, the page number at the top, Exhibit 901,
11 page 9.

12 Q. I'm going to bookmark that just for a moment.

13 MR. BUDGE: Director, I'm going to take a step
14 back and move to admit Exhibit 103, which is the 2015
15 staff memo we discussed a moment ago.

16 THE HEARING OFFICER: Any objection?

17 Hearing no objection, the document marked as
18 Exhibit 901; is that correct, Mr. Budge?

19 MR. BUDGE: 103.

20 THE HEARING OFFICER: I'm sorry. 103. Wait a
21 minute.

22 MR. BUDGE: We're on 901 currently. But I'm
23 stepping to the prior exhibit. I failed to move for its
24 admission while we were discussing it.

25 THE HEARING OFFICER: Okay. Let me work

1 through that again. So you've moved for admission of
2 document marked as Exhibit 103. Any objection?

3 Hearing no objection, the document marked as
4 Exhibit 103 is received into evidence.

5 (Exhibit 103 received into evidence.)

6 MR. BUDGE: Okay. Thank you.

7 Q. (BY MR. BUDGE) And, Matt, thanks for the
8 detour there.

9 Let's go back to Exhibit 901. If you could
10 flip to page 9 of that exhibit?

11 A. Yep, I'm there.

12 Q. Are you familiar with this page of the
13 exhibit?

14 A. Yes, I am.

15 Q. And can you explain what that table on page 9
16 shows?

17 A. So the top half of that slide talks about how
18 we -- what the multi-linear regression that we're using
19 for AFRD2, BID, Minidoka, North Side, Twin Falls Canal
20 Company, and then it provides the equation.

21 And then the table at the bottom is by each
22 one of those members, it's showing what the adjusted
23 R-square value was in 2014 when we established it, or
24 2015. I think the order was signed in 2015. And then
25 it shows the progression of the R-squared for each one

1 of those, in 2016, 2018, 2020, and 2022.

2 Q. And can you explain the significance of an
3 R-squared value, what that term refers to?

4 A. It is a statistic that's calculated with
5 regressions that help users understand how much of the
6 variability that regression equation is accounting for.
7 Generally speaking, the ranges between one and negative
8 one. As you get closer to one or negative one, that's a
9 better value. So in this case the higher values, the
10 higher decimal values that you see here are a better
11 result.

12 Q. And when you say "better," it means that the
13 regression equation is more accurately predicting
14 supply, the higher the number?

15 A. Yeah, generally speaking, yes.

16 Q. And we can see that for the first for SWC
17 members, AFRD2, BID, Minidoka and North Side Canal
18 Company, the R-squared value has remained relatively
19 constant. But for Twin Falls it has declined over time.
20 Do you see that?

21 A. I do see that.

22 Q. You testified earlier that the Department has
23 had some concerns about the regression equation for Twin
24 Falls Canal. Is this representative of the Department's
25 concern?

1 A. Yes, this is it. The reduction in that number
2 from 2014 to 2022 is our concern.

3 Q. And you testified that the Department started
4 in 2020 to begin looking at certain components of the
5 methodology. Is this one of the components that you
6 started reviewing early on?

7 A. Yes, this is one of the first ones we were
8 looking at, forecast supply. Specifically Box Canyon
9 was, but we looked at other things. But we were for
10 sure looking at Box Canyon.

11 Q. Okay. Explain why you were looking at Box
12 Canyon?

13 A. We, as I said earlier, we developed the
14 regressions -- Liz Cresto developed these regressions in
15 2014 and 2015. And then we issued the order in April.
16 And then there was a shift on that gage at Box Canyon.
17 And we were unsure what that meant. We had developed
18 the regressions before that. We were unsure what that
19 meant to our regressions now. Are we going to
20 accurately predict. So that was the first. It's been
21 in our minds since then about, did something change?
22 Can we rely on the regressions that we built? So we had
23 that concern since right away, since day one almost
24 after we issued the order.

25 Q. So Box Canyon may be one of the contributing

1 factors that's causing the degradation in the R-squared?

2 A. It could be, yes.

3 Q. Do you have any other ideas what might be
4 contributing to that?

5 A. The only other variable is Heise, and it's
6 working for the other companies. Maybe for some reason,
7 it's not working for Twin Falls. But it seems like it's
8 Box Canyon.

9 Q. Okay. Is it possible that the model, itself,
10 for Twin Falls Canal just needs to be changed?

11 A. It's possible. And we would consider if we
12 could find another predictor variable that works better
13 that we would change it.

14 Q. Okay. Has the Department evaluated
15 alternative models for Twin Falls?

16 A. At this point, our recommendation was that we
17 would keep watching it, and see if it continues to
18 degrade. So we've done -- I think Kara did three, maybe
19 three variables looking at possible alternatives. But
20 nothing extensive at this point.

21 Q. Okay. Let me have you turn to Exhibit 916,
22 which you might still have in front of you. We reviewed
23 that one earlier today.

24 A. The Lynker comments?

25 Q. Yes.

1 A. From Sophia?

2 Q. Yes.

3 A. Okay.

4 Q. If you turn to page 4 of that exhibit, I think
5 it's --

6 MR. FLETCHER: Did you say 915.

7 MR. BUDGE: 916.

8 MR. FLETCHER: Thank you.

9 Q. (BY MR. BUDGE) It's that top paragraph,
10 No. 2.

11 A. Yep, I see it.

12 Q. Okay. That's not the paragraph, actually.
13 Under the heading "Section 2: Forecasting Natural Flow
14 Supply." You've read this document, Matt?

15 A. Yes.

16 Q. You may remember that in the second paragraph
17 underneath that heading, "Section 2," and you can review
18 it, it's in front of you. That Lynker Technology or
19 Sophia Sigstedt had proposed an alternative
20 recommendation in 2015, a different approach to modeling
21 forecast supply for Twin Falls Canal.

22 Are you familiar with this part of Sophie's
23 report?

24 A. Yes, I am familiar that that's what she's
25 stated, yes.

1 Q. Did you recall that Sophia had made an
2 alternative proposal in 2015?

3 A. I did not remember that proposal.

4 Q. Okay. Do you know if the Department has done
5 any work to evaluate the proposal that Sophia suggested
6 in 2015?

7 A. Not to this point that I know of.

8 Q. Okay. Do you recall advising the Director
9 that Sophia had proposed an alternative mechanism to
10 forecast supply for Twin Falls?

11 A. I don't think I passed that recommendation
12 along to the Director.

13 Q. Matt, let me have you turn to Exhibit 300,
14 which is the Fourth Methodology Order?

15 A. Okay. I'm there.

16 Q. And then turn to page 9.

17 A. Okay. I'm on page 9.

18 Q. If you look down to paragraph 19, it's under a
19 heading "Irrigation Practices." And the sentence in
20 that paragraph states that, "Current condition should be
21 represented by: (a) the net area of the irrigated
22 crops." And then I'm not going to read B and C.

23 A. Okay.

24 Q. But in terms of net area of irrigated crops,
25 do you understand that to mean that current conditions

1 should represent actual irrigated acreage?

2 A. I think that's what "net" means there, the
3 irrigated acres.

4 Q. Okay. And you've been asked a number of
5 questions earlier about different irrigated land
6 datasets. The 2011 irrigated lands dataset, the 2017,
7 near real-time metric dataset, and then there was an
8 analysis done by SPF water engineers in 2009. You are
9 familiar with those different acreage representations?

10 A. Yep.

11 Q. And for Twin Falls Canal Company each of those
12 analyses showed actual irrigated acres around 180,000
13 acres total?

14 A. More or less, somewhere --

15 Q. More or less?

16 A. -- between 180, 179, 183, somewhere in that
17 range.

18 Q. Right in there?

19 A. Yes.

20 Q. After the 2017 irrigated lands dataset came
21 out -- well, let me back up. Can you explain how
22 irrigated acreage is utilized in the model to predict
23 reasonable in-season demand?

24 A. Yes. So --

25 Q. Let me clarify. I said used in the model. I

1 meant used in the methodology.

2 A. Okay. That's what I was going to answer
3 anyway. So when we calculate crop water need, the
4 equation is we take the ET, and we subtract off the
5 effective precipitation. And then we take the ET by
6 crop type, and multiply it by the acres of each crop
7 type that we have calculated with the crop mix.

8 Q. Okay.

9 A. And then -- go ahead.

10 And then with the crop water need, we divide
11 that by project efficiency, and that becomes the
12 reasonable in-season demand on a monthly basis.

13 Q. So if irrigated acreage goes up, the demand
14 prediction goes up. And if irrigated acres goes down,
15 the demand prediction goes down?

16 A. If crop water need -- I guess if the ET and
17 everything else is held constant, that is true.

18 Q. Okay. After the 2017 irrigated lands dataset
19 came out, and that one showed for Twin Falls Canal
20 180,956 acres. Did the Department approach Twin Falls
21 Canal Company and ask them to justify the higher number
22 that they had been reporting, the 194,000 acre number?

23 A. Not that I know of.

24 Q. After the 2021 near real-time metric dataset
25 came out that also showed around 179,000 acres

1 irrigated, do you know if the Department approached Twin
2 Falls at that point and asked them to justify their
3 higher figure?

4 A. Not that I know of.

5 Q. The 194,000 acre-foot figure acre figure the
6 Twin Falls Canal Company reports, that's based on 2013
7 shapefile, I believe; is that right?

8 A. Yes, they submitted us a shapefile. We do
9 some GIS analysis on it to remove overlaps or anything
10 outside the service area.

11 Q. Okay. On that shapefile you said you remove
12 overlaps. Can you explain what that consists of?

13 A. If there is two polygons in a shapefile that
14 overlap, those acres will be double counted.

15 Q. Okay. Did the Department take that 2013
16 shapefile, and also remove hardened acres from that
17 shapefile?

18 A. No.

19 Q. Okay. The 2017 irrigated lands dataset, I
20 understood from Jennifer Sukow's testimony, that it does
21 go kind of field by field and removes hardened acres; is
22 that correct?

23 A. That dataset has three classifications in it.
24 In the irrigated, it takes out any hardened acres.
25 That's usually just fields. But the semi-irrigated will

1 have, as Jennifer explained, will have farmsteads, or
2 maybe a subdivision, where there are a mixture of
3 hardened acres and irrigated acres in there.

4 Q. As of 2017, is it your view that that 2017
5 irrigated lands dataset would have been more accurate
6 than the 2013 shapefile?

7 A. Can you restate the question?

8 Q. Yes. Once the 2017 irrigated lands dataset
9 was completed, at that time do you agree that it would
10 have provided a more accurate representation of
11 irrigated acres than the 2013 shapefile?

12 A. I think so, yes.

13 Q. And I understand that a metric dataset was
14 completed in 2017; is that correct?

15 A. I'm not sure what you mean by a metric
16 dataset?

17 Q. Excuse me. 2021.

18 A. When I saw that on -- I don't know where I saw
19 that -- on a table that came in or something. I think
20 what that is, is when we were doing the real-time
21 metric, we were removing the irrigated acres -- or the
22 non-irrigated acres, using the 2011 irrigated lands
23 dataset for consistency.

24 I think that's where that number comes from.
25 It wasn't generated by near real-time metric. It was us

1 in our processing removing the acres. And what was left
2 may have been reported by as 2021 acres in the technical
3 working group. But it was actually, I'm pretty sure, it
4 was done with the 2011 irrigated lands dataset.

5 Q. Okay. Let me have you turn to Exhibit 325.

6 THE HEARING OFFICER: Mr. Budge, how much
7 longer do you have with Mr. Anders? I think I need to
8 call for a break here. We've been at this probably --

9 MR. BUDGE: I've got probably a half an hour.
10 And I don't mind taking a break.

11 THE HEARING OFFICER: All right. Let's take a
12 break for 15 minutes. And come back at 3:40.

13 (Recess.)

14 THE HEARING OFFICER: Let's start.

15 MR. BUDGE: Back on the record.

16 Q. (BY MR. BUDGE) Okay. Matt, let's shift
17 gears. And let me have you turn to Exhibit 300, which
18 is the Fifth Methodology Order. And when you get there,
19 you can turn to page 10.

20 A. Okay. I'm on page 10.

21 Q. If you look at paragraph 23, that's a finding
22 of fact in the methodology order that deals with
23 supplemental ground water use. Are you familiar with
24 that paragraph?

25 A. Yes, I am.

1 Q. The second sentence, and I'll read that. It
2 says, "Supplemental ground water is a factor the
3 Director can consider in the context of a delivery
4 call." It then cites a district court decision. And
5 then it says, "At this time, the information submitted
6 or available to the Department is insufficient to
7 determine the extent of supplemental irrigation on lands
8 within the service areas of SWC entities."

9 During the Department's technical review of
10 the Fourth Methodology Order, was any effort made to
11 evaluate supplemental ground water use?

12 A. No.

13 Q. The Department does have a database of all
14 surface water and ground water rights; correct?

15 A. Yes, we do.

16 Q. And the Department has a WMIS database that
17 keeps track of all ground water diversions and surface
18 water diversions?

19 A. I don't think that database has all ground
20 water diversions. I believe it just has the ground
21 water diversions that have some kind of measurement
22 order on them that require them to be measured.

23 Q. Okay. I appreciate the clarification. So
24 there are some, you know, small domestic rights and
25 other comparatively small water rights that aren't being

1 measured and reported in WMIS?

2 A. Yes.

3 Q. But in terms of irrigation rights, any
4 irrigation right larger than five acres essentially is
5 being reported in WMIS; correct?

6 A. I don't believe all irrigation rights in
7 Idaho, ground water irrigation rights greater than five
8 acres are in that database. I think they have to have a
9 measurement order or something to get them in that
10 database.

11 Q. The water rights on the -- the ground water
12 rights from the ESPA within the area of common ground
13 water supply, do you understand that they do have a
14 measurement order?

15 A. Yes.

16 Q. Okay. So the ground water rights that are
17 affected by this delivery call, their diversions would
18 be in the WMIS database?

19 A. I believe they are.

20 Q. Okay. Could the Department utilize place of
21 use shapefiles, water right conditions, and diversion
22 data to analyze supplemental ground water use within the
23 Surface Water Coalition entities?

24 A. I think that you could start the analysis with
25 those pieces of data, the water rights, and the WMIS I

1 pumping data. I don't think you can get all the way to
2 clear and convincing with those two pieces of data.

3 Q. What else would you need?

4 A. Those -- I think you need to talk to the
5 individual water users or some fraction of them to try
6 to get an idea of how they are using the water. Some of
7 those systems are complicated. They have well water in
8 with surface water shares. You have to understand the
9 system about where the water is being applied, and when
10 it's being applied. And I don't think you can get that
11 without talking to the users, at least on some level.

12 Q. Yeah. So the Department does have the metric
13 database that's calculating ET?

14 A. Yes.

15 Q. And we do have surface and ground water
16 delivery records. So between irrigated acreage, ET,
17 surface water and ground water deliveries, is it not
18 possible to calculate, at least to the extent we're
19 able, the supplemental ground water use?

20 A. We don't know where the shares are going
21 inside the service areas, you know, for the companies,
22 where they are applying the water. I think, yeah, I
23 don't think you can get the clear and convincing without
24 talking to the users just on a remote sensing type of
25 analysis.

1 Q. Well, I'm not asking about legal standards --

2 A. Okay.

3 Q. -- clear and convincing evidence. So
4 disregard what the legal standard is?

5 A. Okay.

6 Q. I'm just saying, technically does the
7 Department have a way to do that? Because we heard
8 Jennifer Sukow say that, yes, they do that in the model?

9 A. In the model, they have a dataset that they
10 are using.

11 Q. Okay. Could we use that same dataset in the
12 methodology order?

13 A. Theoretically, we could.

14 Q. Okay. If that's all we've got, that's the
15 best we've got, could we use that?

16 A. When I say "theoretically" we could use that
17 dataset. I don't think that dataset achieves or meets
18 the clear and convincing, again.

19 Q. Okay. But --

20 A. You've told me not to do that.

21 Q. -- setting that aside. I'm just asking
22 technically, is that the best data you've got today?

23 A. That dataset is -- my understanding of that
24 dataset was, it was originally created before the SRBA,
25 based on water rights. And at that time, IDWR was

1 tracking surface and ground water on the water rights.
2 That's a very old dataset. We haven't updated it since.
3 So theoretically we could use that dataset. It may be
4 the best dataset we have. It's not the best dataset.

5 Q. Yeah. I'm going to think of it kind of like
6 the R-squared for Twin Falls. It's not that great. But
7 it might be the best thing we've got. Is that a fair
8 analogy?

9 A. Those are such vastly different datasets.
10 When you say that for Twin Falls Canal Company for that
11 regression, we have been working on that. We have been
12 updating that. You are talking about a very old dataset
13 here in my mind. Perhaps those might be the best
14 dataset we have.

15 Q. Okay. Because the methodology does not
16 account for supplemental -- actually, let me strike that
17 question. I'm going to take a step back.

18 You are aware that many of lands within the
19 surface water entities do have supplemental ground water
20 rights?

21 A. I do know they do have supplemental ground
22 water rights. How many? I don't know.

23 Q. But we know there is ground water being used
24 to irrigate some the lands within the surface water
25 entities; right?

1 A. I think there are likely lands that are ground
2 water only within the Surface Water Coalition service
3 areas. And what we would call a supplemental, where
4 there is surface water and ground water used on the same
5 land. Yeah, I think they are in there.

6 Q. And so when the methodology order does not
7 take into account supplemental ground water use, the
8 effect of that is an assumption that all of the land
9 within each Surface Water Coalition entity, is irrigated
10 solely with surface water; correct?

11 A. Yeah, that is the way that we're doing that.

12 Q. And if in reality there is ground water being
13 used to irrigate some of those lands, then by not taking
14 into account supplemental ground water use, the
15 methodology effectively overstates surface water demand
16 within the Surface Water Coalition entities?

17 A. I think so. It would over calculate, yes.

18 (Exhibit 928 marked.)

19 Q. (BY MR. BUDGE) Okay. Let me turn your
20 attention next to Exhibit 928. Matt, I'm actually going
21 to change numbers on you. Let's go to 907.

22 A. Okay. I have that presentation.

23 Q. I apologize for the delay. I'm not pulling up
24 the slide that I expected. I've got a typo in my notes.
25 That was a mistake on my part.

1 I am going to go back to Exhibit 928. This is
2 a PowerPoint presentation. It is titled "Proposed
3 Modification and Method for Determining Reasonable
4 In-Season Demand for Surface Water Coalition Use of the
5 Real-Time Metric," by Ethan Geisler, Kara Ferguson, and
6 Matt Anders, dated December 1st, 2022.

7 Is that what you are looking at, Matt?

8 A. I am.

9 Q. Do you recognize this as one of the working
10 group presentations given last December?

11 A. Yes.

12 Q. Why don't you flip to the last slide, Slide
13 No. 22. It's labeled "SWC Methodology Acres." And it
14 lists what I understand are the number of acres utilized
15 for each Surface Water Coalition member in the
16 methodology order.

17 A. Yep, I'm on page 22.

18 Q. And is that what that slide reflects?

19 A. Yes, for the 2022 irrigation season.

20 Q. Okay. And under "SWC Member," A & B, there is
21 an asterisk. And then there are some notes down at the
22 bottom it says asterisk "A & B acres include," and there
23 is a "1-14, 14,637 acres." Can you explain what that
24 refers to?

25 A. That is -- so this bullet is our notes, are my

1 notes about how we got the irrigated acres for A & B.
2 So the first bullet under "A & B acres include:" 1-14
3 is the water right. And the 14,637 is the number of
4 acres.

5 Q. So A & B owns water right number 1-14. And
6 that water right authorizes the irrigation of 14,637
7 acres?

8 A. Yes.

9 Q. And then in the table, it shows that the
10 methodology order is using 15,924 acres. Do your other
11 notes explain the difference there?

12 A. Yes. So the second bullet, it's "beneficial
13 use claims," and then it lists the series of water
14 rights there. And then the number of acres for those.
15 And then the final bullet is enlargement. It lists two
16 water rights, and then 1175.2 for acres. So A & B if
17 you add those three numbers together, they should -- the
18 14,637, the 111, and the 1,175, it should total up to
19 15,924 in the upper table.

20 Q. Do you know what priority rights are in the
21 beneficial use claims in the enlargement water rights?

22 A. I do not.

23 Q. Are you familiar with enlargement water rights
24 generally?

25 A. Very, very generally.

1 Q. Okay. I'll just represent that enlargement
2 rights have an effective priority date of 1994, which is
3 junior to probably all of the ground water rights that
4 are at risk of curtailment under the methodology order.

5 And so my next question is, has there been
6 discussion within the Department staff as to whether the
7 methodology should be run based on the 14,637 acre
8 figure instead of the 15,924 acre figure?

9 A. No, we haven't had any discussions about that.

10 Q. Okay. If, as I represented, the enlargement
11 rights are junior to the ground water rights of IGWA and
12 others, do you agree that it would probably be important
13 or appropriate to make that adjustment, and run the
14 methodology based on the 14,637 acre figure?

15 A. I don't know. I would have to investigate it
16 further.

17 Q. Okay. Fair enough. Let me ask a few
18 follow-up questions about the Director's move from the
19 steady state to a transient state model. Are you aware
20 of the settlement agreement between IGWA and the Surface
21 Water Coalition related to the Coalition's delivery
22 call?

23 A. Yes, I'm aware of it.

24 Q. Are you aware that there is an ongoing dispute
25 between them concerning the breach of that agreement?

1 A. Also aware of that, yes.

2 Q. Did that ever come up in your discussions
3 concerning the Fifth Methodology Order?

4 A. No, not that I remember.

5 Q. Okay. Are you aware that IGWA and the
6 Coalition were involved in settlement negotiations this
7 last February?

8 MR. FLETCHER: Director, I'm going to object,
9 again, to the same line of questioning I objected to
10 earlier. I'm not sure whether this is relevant.

11 THE HEARING OFFICER: Sustained.

12 Q. (BY MR. BUDGE) Matt, let me ask, I've just
13 got a few more questions. I'm almost done. So I
14 appreciate your patience.

15 Is it your understanding, Matt, that the
16 change in the baseline year from the Fourth Methodology
17 to the Fifth Methodology would result in much larger and
18 more frequent demand shortfall predictions?

19 A. In April.

20 Q. In April?

21 A. It will increase the shortfall predictions.

22 Q. Okay.

23 A. In July, we also use the baseline year. So it
24 will likely increase July, not for certain. But it will
25 likely do that as well.

1 Q. Okay. And then as the demand shortfall
2 becomes larger and more frequent, that translates into
3 larger and more frequent curtailments of junior ground
4 water rights in the absence of mitigation?

5 A. In April and July.

6 Q. In April and July?

7 A. Yes.

8 Q. And you understood that when you change from a
9 steady state to transient state curtailment, you end up
10 with exponentially more acres being curtailed under the
11 Fifth Methodology Order than what have occurred under
12 the Fourth?

13 A. I don't know about exponentially. But it is a
14 larger acreage that's curtailed.

15 (Exhibit 929 marked.)

16 Q. (BY MR. BUDGE) Okay. Let me have you turn to
17 the Conjunctive Management Rules, and that's Exhibit
18 929.

19 A. Okay. I have the rules.

20 Q. Are you familiar with the Conjunctive
21 Management Rules?

22 A. Generally.

23 Q. If you'll scroll down to, I believe, it's page
24 4, Rule 20. I'll just give you a moment to read rules
25 20.03 and Rule 20.04.

1 A. Did you say page 4?

2 MR. WOOD: Page 5.

3 Q. (BY MR. BUDGE) It's page 5. My mistake.

4 A. Page 5. I'm sorry?

5 Q. Yes.

6 A. Okay.

7 Q. Yes, just take a moment to refresh your memory
8 as to 20.03 and 20.04.

9 A. Okay.

10 Q. At the bottom of 20.03, there is a statement,
11 "An appropriator is not entitled to command the entirety
12 of large volumes of water in a surface or ground water
13 source to support his appropriation contrary to the
14 public policy of reasonable use of water as described in
15 this rule."

16 Are you familiar with that concept?

17 A. A little bit familiar.

18 Q. Okay. Looking in 20.04, there is a reference
19 to the futile call doctrine. The second sentence says,
20 "The principle of the futile call applies to the
21 distribution of water under these rules."

22 Are you familiar with the futile call
23 doctrine?

24 A. Yes, I am.

25 Q. Okay. And then next I'm going to have you

1 scroll down to Rule 40.03. It's on page 9.

2 A. "Reasonable Exercise of Rights."

3 Q. Yeah. Go ahead and review that?

4 A. (Witness complying.) Okay.

5 Q. And so just to summarize 40.03, just explains
6 that the Director will consider reasonable use of water
7 under Conjunctive Management Rules. And so my question,
8 were the concepts we just reviewed, were these ever
9 brought up in connection with the technical work that
10 you did in connection with the Fifth Methodology Order
11 or the As-Applied Order?

12 A. Not that I remember.

13 Q. There wasn't any discussion of how -- let me
14 strike that question.

15 You weren't given any instructions from the
16 Director to perform technical analyses related to those
17 concepts?

18 A. No, I was not.

19 Q. Are you familiar with how the Department
20 applies the futile call doctrine in surface water
21 systems?

22 A. Yes, I am.

23 Q. Can you just explain briefly how that's
24 applied?

25 A. If a water user makes, in my layman's terms,

1 if a water user makes a water call, if the water cannot
2 be delivered to that user, it's considered futile, and
3 the call is not honored or made.

4 Q. Okay. Have you been involved just personally,
5 in water distribution where the futile call doctrine is
6 applied in Idaho?

7 A. I don't know if they apply it. But the
8 closest would be in the Big Lost for the water righted
9 county. They argue every year about, can we get water
10 down below the Darlington Sinks. I don't know if they
11 use the futile call. But they are always talking about
12 it.

13 Q. Okay. Do you know if there is any like time
14 parameters that are utilized in the Big Lost to evaluate
15 whether a call is futile or not?

16 A. I don't remember off the top of my head if
17 they use a parameter.

18 Q. Okay. Who within the Department would be most
19 qualified to testify as to that?

20 MR. THOMPSON: I guess I'll lodge an objection
21 here, Director. I guess the surface water
22 administration around the state, and how futile call is
23 applied to specific basins, I think is irrelevant to
24 this proceeding.

25 THE HEARING OFFICER: I'll overrule the

1 objection.

2 But, Mr. Budge, I wonder about the relevance
3 of the question. But I'll ask Mr. Anders to answer it.

4 THE WITNESS: Probably somebody in the water
5 compliance Bureau. They deal with watermasters, and
6 rules, futile calls, things like that.

7 Q. (BY MR. BUDGE) Okay. And, Director, I only
8 have a couple questions on this topic.

9 Are you familiar with the application of the
10 futile call doctrine in the Teton River basin?

11 A. I am not.

12 Q. Okay. Would Tony Olenichak be most suited to
13 explain how it works in that context?

14 A. If it's in Water District 1, he would be the
15 person to talk to as the watermaster.

16 Q. Okay. That's all the questions I have in that
17 regard. Just a few more questions.

18 Has the Department conducted any analysis of
19 just the long-term effects of the beneficial use of
20 water from the ESPA as a result of the changes made in
21 the Fifth Methodology Order?

22 A. No.

23 Q. Has the Department attempted to quantify the
24 additional beneficial use that would occur within
25 members of the Surface Water Coalition as a result of

1 changes made in the methodology order?

2 A. Not that I know of.

3 Q. Are you familiar with the concept of a
4 trimline that's been used in other delivery calls?

5 A. I've heard of the trimline, yes.

6 Q. Okay. What's your understanding of the
7 concept?

8 A. It is a geographic area used in modeling.

9 Q. Did that term ever come up in connection with
10 your work on the Fifth Methodology Order?

11 A. No.

12 Q. So to your knowledge, none of the Department
13 technical staff asked if there should be some evaluation
14 of trimlines?

15 A. It's related to modeling. I don't remember
16 any conversations, but I am not involved in all of the
17 conversations related to modeling.

18 MR. BUDGE: Okay. That's all the questions I
19 have. Thank you, Matt.

20 THE WITNESS: Thank you.

21 THE HEARING OFFICER: Thank you, Mr. Budge.

22 Further questions from the ground water group?
23 Mr. Bromley.

24 MS. McHUGH: Yes. Oh, is Mr. Bromley going to
25 do it?

1 THE HEARING OFFICER: Mr. Bromley is standing
2 halfway to the podium.

3 MS. MCHUGH: Okay.

4 THE HEARING OFFICER: I could ask Mr. Bromley
5 if he wants to yield.

6 MR. BROMLEY: I've got to take a shot,
7 Director.

8 THE HEARING OFFICER: Okay.

9 CROSS-EXAMINATION

10 QUESTIONS BY MR. BROMLEY:

11 Q. Hi, Chris Bromley on behalf of the Coalition
12 of the Cities. Matt, I just have a couple questions
13 here.

14 So Exhibit 300, which is the Fifth Methodology
15 Order, if you could turn to that?

16 A. Yes.

17 Q. And let's look at page 18.

18 A. Did you say 18?

19 Q. Yes, I did.

20 A. Okay. I'm on page 18.

21 Q. Great. And we've got paragraphs 49 and 50.
22 And when I look at paragraph 49, it's talking about
23 predicting natural flow to members of the Surface Water
24 Coalition. And when I look at paragraph 50, I see that
25 it's talking about predicting storage allocations for

1 each member of the Coalition. Would you agree with
2 that?

3 A. Yes.

4 Q. Great. So in Footnote 15, I see that there
5 were a series of meetings held in the winter of '22-'23
6 with parties' technical consultants to discuss potential
7 updates to the methodology order. And you are looking
8 at trying to better predict Surface Water Coalition
9 water supplies in April. That's what I take from that
10 footnote; is that correct?

11 A. Yeah, that's accurate.

12 Q. Did you have any discussions with Water
13 District 1 about how to improve the forecasting?

14 A. Not about how to improve the forecasting.

15 Q. How about to improve looking at storage water
16 allocations?

17 A. We normally in the as-applied process, are
18 talking to them about what they think the reservoirs are
19 going to fill to what rights they are going to fill.
20 And we don't ask them for an official opinion. But we
21 do ask them for what they think is going to happen. And
22 then we factor that into our storage allocations.

23 Q. Okay. In the as-applied?

24 A. In the as-applied, yes.

25 Q. Great. And then let's go back to Exhibit 928.

1 That was one that TJ was talking with you about. It was
2 a technical working group document. And it was the last
3 page in that exhibit, to make it easier to flip through.

4 A. So I'm at 928.

5 Q. The last page of 928; correct?

6 A. Okay. Page 22 for me.

7 Q. Correct, that's what I have.

8 A. Okay.

9 Q. "SWC Methodology Acres" is the title of the
10 slide?

11 A. Yep.

12 Q. And at the bottom, Mr. Budge was asking you
13 about these enlargement acres. And I believe I heard
14 you say, you didn't know what enlargement acres were; is
15 that correct?

16 A. Generally that's correct, yes.

17 Q. So do you know has the Department backed out
18 any other enlargement acres, or are these the only ones
19 that have been identified?

20 A. In terms of the methodology acres that we use,
21 these are the only enlargement acres that I remember.
22 There may be enlargement in the other one. I just
23 listed these, because they were confusing to me about
24 how we got to the 15,924.

25 Q. Okay. And that makes sense. So you don't

1 know then how many enlargement acres are within these
2 other companies --

3 A. I do not.

4 Q. -- within in an irrigated area?

5 A. Sorry. I do not.

6 MR. BROMLEY: Okay. Thank you. I have no
7 further questions.

8 THE HEARING OFFICER: Any further questions?

9 MS. McHUGH: Yes, Mr. Director, this is
10 Candice. I just have a couple clarification questions.

11 THE HEARING OFFICER: Okay. Go ahead.

12 MS. McHUGH: And I had to switch to my
13 headphones. So can everybody hear me okay?

14 THE HEARING OFFICER: You are audible.

15 MS. McHUGH: Okay. Great.

16 CROSS-EXAMINATION

17 QUESTIONS BY MS. McHUGH:

18 Q. Matt, my understanding from your testimony is
19 that you've been involved with two different technical
20 working groups, at least one relative to the Surface
21 Water Coalition methodology orders, one in 2015, and one
22 in 2022; is that correct?

23 A. Yes.

24 Q. Has there been any others relative to this
25 Surface Water Coalition delivery call that you've been

1 involved in?

2 A. No other technical working groups that I can
3 think of.

4 Q. Okay. And how are those technical working
5 groups compiled, like who gets invited?

6 A. I don't remember on the 2015 technical working
7 group. But for, we'll call it the 2022 technical
8 working group, I asked the Director for guidance on who
9 should be invited.

10 Q. And what were you instructed as far as who
11 should be invited?

12 A. The response from the Director was to ask the
13 parties who they wanted to attend.

14 Q. And by the "parties," do you mean the parties
15 that had already been part of the Surface Water
16 Coalition delivery call that dated back to 2008, 2009
17 time frame?

18 A. Yeah, I think so. The Surface Water
19 Coalition, IGWA, and the Cities are who I talked to.

20 Q. Okay. And when does that invitation get sent
21 out, and by what method?

22 A. My best estimate is in September, the Director
23 at the status -- or at a status conference, said we were
24 going to have a technical working group. So probably
25 early September is when, or late August maybe, I emailed

1 the attorneys or the legal counsel for the different
2 parties, and asked them who they wanted to attend the
3 technical working group.

4 Q. Okay. And that was in 2022?

5 A. Yeah.

6 Q. Okay. And can you tell me what suggestions
7 from the 2022 technical working group, did you recommend
8 that be implemented in the Fifth Methodology Order, from
9 non-Department employees? I should clarify.

10 A. I can't think of -- I don't think we used any
11 or implemented any of the recommendations from the
12 technical working group.

13 Q. And what -- any datasets or any kind of
14 technical information, other than methods, did you
15 recommend from the technical working group?

16 A. I didn't quite understand that question.
17 Could you repeat it?

18 Q. I understood you to say that you didn't
19 implement any suggestions as to like a method from the
20 technical working group. And I was following up just to
21 clarify. Did you use any improved data, or datasets,
22 or, you know, that kind of information that was provided
23 from the technical working group?

24 A. I don't think so.

25 Q. Okay. In the 2015 technical working group,

1 what suggestions from the 2015 technical working group,
2 did you implement or recommend be used in the
3 methodology?

4 A. I don't remember the recommendations from the
5 different consultants at that point.

6 Q. Okay. But you think that you may have taken
7 some from the outside consultants and incorporated into
8 the methodology?

9 A. I don't know.

10 MS. MCHUGH: I don't have any further
11 questions.

12 THE HEARING OFFICER: Okay. Further questions
13 from the ground water group? I don't see any hands
14 raised.

15 So let's shift. And I think now the Surface
16 Water Coalition, if you wish to question Mr. Anders, you
17 may examine.

18 Mr. Thompson.

19 CROSS-EXAMINATION

20 QUESTIONS BY MR. THOMPSON:

21 Q. Good afternoon, Mr. Anders, Travis Thompson
22 for A & B, et al. Just a couple questions.

23 (Exhibit 118 marked.)

24 Q. (BY MR. THOMPSON) So if you could turn to
25 Exhibit 118. Would you please identify that for the

1 record?

2 A. Did you say 118?

3 Q. Correct.

4 A. I'm there.

5 Q. Do you recognize that document?

6 A. Yes.

7 Q. And were those comments submitted by
8 consultants for the Surface Water Coalition?

9 A. Yes, they were.

10 Q. And did the Department consider those comments
11 and others submitted by other consultants?

12 A. Yes, we did.

13 Q. I'm going to go back to a few questions on is
14 it the irrigated land dataset that the Department
15 created?

16 A. Yes.

17 Q. And you said they did one in 2011 and 2017?

18 A. Yes.

19 Q. And are those different staff that created
20 those?

21 A. I think it was created by the same staff. But
22 I'm not totally sure on that. They would have been IDWR
23 staff.

24 Q. And that's a snapshot of a single year; is
25 that correct?

1 A. Yeah. They are designed to just identify the
2 irrigated, non-irrigated, and semi-irrigated for that
3 year.

4 Q. And do staff ground proof those estimates with
5 individual irrigators?

6 A. I don't know.

7 Q. How about individual canal companies or
8 irrigation districts?

9 A. I also don't know.

10 Q. I think you testified earlier that you agreed
11 that certain lands that show up irrigated one year, may
12 not be irrigated the next; is that true?

13 A. That is true.

14 Q. And vice versa, non-irrigated lands may not be
15 not irrigated one year, but irrigated the next?

16 A. Also true.

17 Q. You said those data land sets --

18 A. Irrigated lands dataset.

19 Q. Irrigated lands dataset. Sorry. Three
20 categories, we've got an irrigated, non-irrigated, and
21 semi-irrigated?

22 A. Correct.

23 Q. And do each of those categories have specific
24 numbers of acres?

25 A. I don't understand the question.

1 Q. I think we talked about at least the example
2 for Twin Falls Canal Company, the 2017 dataset had a
3 number of like 179,000. Do you know if that was the
4 irrigated lands dataset for that year?

5 A. Each -- we can calculate the acres for each
6 one of those categories. The 179 was what was left, the
7 number of acres, irrigated acres left in the shapefile
8 from Twin Falls Canal Company after we removed the
9 non-irrigated using the irrigated lands dataset.

10 Q. So it would include semi-irrigated?

11 A. Yes, that would include semi-irrigated.

12 MR. THOMPSON: That's all the questions I
13 have. Thank you.

14 THE WITNESS: Thank you.

15 MR. FLETCHER: No questions.

16 THE HEARING OFFICER: All right. Let's circle
17 back again.

18 Mr. Wood, do you have any questions?

19 MR. WOOD: Just a couple.

20 REDIRECT EXAMINATION

21 QUESTIONS BY MR. WOOD:

22 Q. Hi, Matt. Do you recall testifying earlier
23 about using Twin Falls Canal Company's irrigated acres
24 dataset?

25 A. I do.

1 Q. And do you recall attorneys for the ground
2 water users suggesting that the Department should use
3 Twin Falls Canal Company's irrigation acre dataset
4 rather than the decreed acres?

5 A. I didn't understand the question there.

6 Q. Do you recall a suggestion that the Department
7 should use Twin Falls Canal Company's irrigated acres,
8 rather than their decreed acres?

9 A. I think what they were recommending was we use
10 the irrigated acres after we removed the non-irrigated
11 with the irrigated lands dataset.

12 Q. That's a better way to put it. In your
13 opinion, what would it take from a staffing perspective
14 to implement the dataset as suggested by the ground
15 water users?

16 A. Those irrigated lands datasets take about one
17 year of staff time to make, to review and to do the
18 edits. So we would have to dedicate quite -- I mean, if
19 we wanted to do it in the current irrigation season, we
20 would have a lot of staff time trying to get it done in
21 time to be used with the methodology. If we did a year
22 like the previous year, we would still have to exert a
23 lot of effort to get it created.

24 Q. So are staffing issues one of the reasons that
25 the dataset wasn't used?

1 First, regarding the regression equation for
2 Twin Falls Canal Company, you were asked whether the
3 current regression formula still accurately predicts the
4 forecast supply? Do you recall that question?

5 A. I do.

6 Q. Accuracy is a matter of degree; right?

7 A. Okay.

8 Q. So you would agree that the prediction is
9 becoming less accurate over time?

10 A. I think that's what the R-squared is telling
11 us, that statistic, yes.

12 Q. So your testimony is, in your opinion, it's
13 not become so inaccurate, that you can't use it at all?

14 A. Not yet.

15 Q. Okay. But that time could come?

16 A. It might come. It might -- we have seen them
17 stabilize. It might stabilize where it is. It might go
18 up a little bit. We don't really know.

19 Q. Okay. Next, just about the staffing required
20 to create an irrigated lands dataset. When you answered
21 that it takes a lot of work. You are talking about
22 creating a new irrigated lands dataset?

23 A. Yes, I think they often start with the
24 previous one. But to create a new one, it is a lot of
25 staff time to update the lines, and to do all the

1 analysis. We are experimenting with ways to automate
2 that. We don't have it to the point where we think we
3 have the accuracy that we want to yet. If we could get
4 to an automated method, we might be able to get one for
5 every year. We don't know yet, but we are experimenting
6 with it.

7 Q. Okay. And once the 2017 dataset was created,
8 it certainly could have been implemented in the
9 methodology in, say, 2018?

10 A. Well, I don't know when that dataset was
11 finished. For example, they're working on 2021 right
12 now. So it would have been at some point after. And if
13 it takes a year, it probably would have been a couple of
14 years after when it became available. I'm just
15 estimating. I don't know when exactly they started on
16 that one. But there is a lag there by at least a year
17 and maybe more.

18 Q. I understand. Are you familiar with the near
19 real-time metric dataset?

20 A. I am.

21 Q. And that dataset also, if I understood
22 Ms. Sukow, also can tend to delineate irrigated versus
23 non-irrigated acres?

24 A. Yeah, it's showing ET, or actual ET on the
25 ground. So, yeah, it can indicate whether something is

1 irrigated or not.

2 Q. And that dataset I believe is available
3 annually?

4 A. The metric dataset or the near real-time
5 metric?

6 Q. Let's start with the near real-time metric.

7 A. Right now we're in testing mode with the near
8 real-time metric to see if we can do it on schedule.
9 But we need further methodology. So that one, I don't
10 know if we have 2022. But up to that point, we were
11 getting it like July 5th, August, September, so we had
12 that one real-time, yes.

13 For metric, I don't know if they've done all
14 the years for metric, because they make that decision
15 after the season is over and based on the cloud cover.
16 Clouds are difficult for, to get a good metric dataset
17 if you've got a lot of clouds. So I don't know what
18 years they have done.

19 They don't always -- for example, we did
20 real-time metric, but they didn't do metric for all
21 those years that we did near real-time.

22 Q. So it sounds like there are tools available or
23 under development that are going to enable more frequent
24 evaluation of irrigated acres using metric or the data
25 lands, the irrigated lands dataset?

1 A. I think there is things, yeah, developing.

2 Q. And in terms of the staffing, it wouldn't be
3 hard to plug a different acreage figure into the
4 methodology order, that could be done, you know, with a
5 push of the button. The staffing you are talking about
6 is creating a new dataset, or an updated dataset?

7 A. You are correct.

8 Q. So the Department could today rerun the
9 methodology with the figures from the 2017 irrigated
10 lands dataset, and that would not take a lot of time?

11 A. No, you are correct, that would be easy.

12 Q. And they could do the same with the most
13 recent metric or near real-time metric data?

14 A. Once we have the number, it's easy to plug
15 into the calculator.

16 MR. BUDGE: Okay. That's all I've got.

17 Thanks, Matt.

18 THE WITNESS: Thank you.

19 THE HEARING OFFICER: Further questions from
20 the ground water group?

21 And one more chance for questions from the
22 Surface Water Coalition. Any further questions?

23 Apparently not. Okay. We are finished with
24 Matt Anders.

25 (Witness dismissed.)

1 THE HEARING OFFICER: It is 4:30. I don't see
2 Jay Barlogi in the gallery. So I'm assuming that Jay is
3 next; is that correct?

4 MR. THOMPSON: Yes, Director. I've been in
5 communication with him and have him online if that's an
6 option. I guess depending on what the parties want to
7 do?

8 THE HEARING OFFICER: What's the preference of
9 the parties?

10 Mr. Bromley?

11 MR. BROMLEY: Well, I was going to take the
12 primary lead of questioning of Mr. Barlogi. I do have
13 some physical exhibits. And he's not here to look at
14 those.

15 THE HEARING OFFICER: Are we expecting
16 Mr. Barlogi in person tomorrow?

17 MR. THOMPSON: Yes.

18 MR. FLETCHER: He will be here in the morning.

19 THE HEARING OFFICER: Well, I think we're on
20 schedule, and maybe just a little ahead looking at the
21 list of witnesses, so perhaps --

22 MR. ANDERSON: Just as a --

23 THE HEARING OFFICER: Mr. Anderson?

24 MR. ANDERSON: Just as a way to save time, I
25 have a matter that I could take up just quickly

1 regarding the order that you made this morning. It's a
2 little off-the-cuff, but just a couple minutes. If it's
3 okay?

4 THE HEARING OFFICER: Okay. That would be
5 fine. But as Mr. Anderson is coming forward, it appears
6 to me that we're at a logical breaking point. And maybe
7 we ought to adjourn following Mr. Anderson's
8 presentation.

9 MR. THOMPSON: Could we move to admit Exhibit
10 118?

11 THE HEARING OFFICER: Pardon me?

12 MR. THOMPSON: Could we move to admit Exhibit
13 118?

14 MR. FLETCHER: That was the Surface Water
15 Coalition comments on the recommendations to the
16 technical working group.

17 THE HEARING OFFICER: Prepared by Dave Colvin
18 and Dave Shaw, I think so.

19 MR. FLETCHER: I think, yeah.

20 THE HEARING OFFICER: Yes. Any objection to
21 admitting the document marked as Exhibit 118?

22 Seeing no objection, the document marked as
23 Exhibit 118 is received into evidence.

24 (Exhibit 118 received into evidence.)

25 MR. ANDERSON: Thank you, Director. Just as a

1 way of utilizing our time wisely, and this is a little
2 off-the-cuff given the order that was this morning. I
3 am just doing a brief, ask the Director to reconsider
4 the order regarding economic benefit, just some really
5 small discussion regarding that. And then in the
6 alternative, just offer an informal offer of proof here,
7 if that's okay?

8 THE HEARING OFFICER: Go ahead.

9 MR. ANDERSON: In the Fifth Methodology Order,
10 Exhibit 300, I believe, which we've been talking about.
11 There are conclusions, specifically conclusions No. 6.
12 And it talks about the public interest, full economic
13 benefit and optimum development of water resources for
14 the public interest. It talks about full economic
15 development in the result of the optimum development of
16 water resources. The policy of securing the maximum use
17 and benefit and least wasteful use of the state water
18 resources applies to both the surface water and ground
19 water. And I'm kind of paraphrasing a little bit. But
20 these are all quotes from cases in the sixth finding in
21 the methodology order.

22 The issue I think is the lack of facts cited
23 to support that finding. I think the lack of facts is
24 what the Department relied on earlier in making an order
25 that the methodology didn't address economic issues.

1 And so it was beyond the scope to address those at this
2 hearing.

3 I think the lack of facts cited in making this
4 finding of No. 6 is a reason why economic issues should
5 be permitted into this hearing, to bolster the facts,
6 and bolster the evidence in making that finding.

7 Whether or not the Department gives them whatever weight
8 the Department wants, I certainly think it's within the
9 public interest to do so. I would argue that perhaps
10 the decision of the Department to go with steady state
11 in the first place rather than change of methodology
12 order to be con-transient in itself has some inherent
13 economic aspects. So I would just ask the court to
14 reconsider.

15 In the alternative, rather than do a formal
16 offer of proof, I think that in this case an informal
17 offer of proof would be streamlined and everyone would
18 appreciate it, just given the fact that we have an
19 expert that would be traveling from out of town to do
20 that formal offer of proof. And I think it was Judge
21 Stegner, when he was a judge said that an informal offer
22 of proof is appropriate when the attorney presenting it
23 is not simply conclusory stating the summary of facts
24 that will be presented, and is not hypothetically
25 stating facts that may be presented.

1 Here we have a simple expert report. And so I
2 would just like to informally submit that as an offer of
3 proof in the alternative that the Department wouldn't
4 reconsider its decision on excluding economic testimony.

5 THE HEARING OFFICER: Okay. Thank you, Mr.
6 Anderson.

7 I'm certain the Surface Water Coalition wants
8 to respond. Mr. Thompson, Mr. Fletcher.

9 MR. FLETCHER: Director, we agree with the
10 Director's ruling on this issue. We were surprised by
11 the issues people wanted to raise in this methodology.
12 A lot of these issues were raised in the earlier
13 methodology. There is multiple cases dealing with this
14 issue. And it's not a matter of wanting economic harm
15 to the various parties in order to determine who should
16 receive the water under the priority doctrine. And so
17 we agree with how the Director ruled on this issue this
18 morning.

19 MR. ANDERSON: A 30 second rebuttal.

20 THE HEARING OFFICER: Sure, Mr. Anderson.

21 MR. ANDERSON: And I agree, it's not
22 necessarily about weighing the harm between the parties.
23 But when you have such an exorbitant curtailment at
24 stake, it's certainly relevant for the Department to
25 take that into consideration in the public interest and

1 use of the resource. It has nothing to do with the
2 economic benefit or realization of the two parties and
3 comparing them. It's just something that the Department
4 is within its discretion as the courts' have said to
5 consider.

6 THE HEARING OFFICER: All right. Well,
7 thanks, Mr. Anderson. I'll at least take the motion,
8 and I'll characterize it as a motion, under advisement.
9 And rule on it tomorrow morning when we start.

10 I will tell you, though, that I have read the
11 motion in limine, or the motion to limit, and have at
12 least reviewed the citations and the quotes. And have
13 some memory of those decisions that were issued by the
14 court related to whether the Department could consider
15 the economic benefits as part of determining whether a
16 junior, or the holders of junior-priority water rights
17 should be curtailed.

18 And I thought at least one of those quotes was
19 telling, because the court essentially said that the
20 Department should not be reviewing. And the Director
21 should not be reviewing the respective economic benefits
22 of water use. And delving into the actual financial
23 standing and books of the various parties. And the
24 warning I think from the courts was that it would
25 compromise the prior appropriation doctrine. And the

1 expected administration of water rights under the prior
2 appropriation doctrine.

3 So I'll take it under advisement with I guess
4 some reluctance. But I'll look at it, and rule on it in
5 the morning.

6 Okay. Anything else we need to talk about?

7 MS. McHUGH: Mr. Director, this is Candice.
8 This doesn't have to be on the record. It is just a
9 housekeeping piece.

10 THE HEARING OFFICER: Well, go ahead. We're
11 on the record.

12 MS. McHUGH: Okay. Fair enough. I'm
13 traveling by air tomorrow for the most part, and so just
14 as a courtesy to the Director and the parties, I won't
15 be participating the full day remotely. But just kind
16 of wanted you to know that I'm not missing in action.
17 If all of the sudden I'm off, it is because I'm actually
18 traveling tomorrow.

19 THE HEARING OFFICER: All right. Thanks for
20 the heads up, Candice.

21 So what time should we start in the morning?
22 Do you want to start at 9:00? Do you want to start at
23 8:30? What's the preference? Do you want to start at
24 7:30?

25 MS. KLAHN: How about 9:00?

1 THE HEARING OFFICER: 9:00.

2 MR. FLETCHER: 9:00 is fine.

3 THE HEARING OFFICER: All right. Let's start
4 at 9:00 a.m. tomorrow morning. Thanks for the help from
5 everyone here. And we'll adjourn for the night. So
6 let's go off the record and then review the exhibits.

7 (Hearing adjourned at 4:46 p.m.)

8

9

10

11

12

13

14

15

16

17

18

19

20

21

22

23

24

25

1 REPORTER'S CERTIFICATE

2 I, COLLEEN P. DOHERTY, CSR No. 345, Certified
3 Shorthand Reporter, certify:

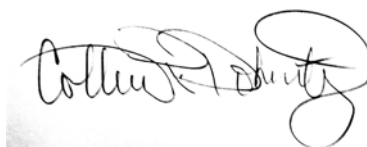
4 That the foregoing proceedings were taken
5 before me at the time and place therein set forth, at
6 which time the witness was put under oath by me;

7 That the testimony and all objections made were
8 recorded stenographically by me and transcribed by me or
9 under my direction;

10 That the foregoing is a true and correct record
11 of all testimony given, to the best of my ability;

12 I further certify that I am not a relative or
13 employee of any attorney or party, nor am I financially
14 interested in the action.

15 IN WITNESS WHEREOF, I set my hand and seal this
16 16th day of June, 2023.

17
18
19 

20
21 COLLEEN P. DOHERTY, CSR 345

22 Notary Public

23 P.O. Box 2636

24 Boise, Idaho 83701-2636

25 My commission expires September 7, 2023.

/	acknowledge (1) 143:5	21:4;22:14;76:12;87:8; 90:9;92:16;95:21;100:3;	Adolphus (1) 120:8
/// (1) 150:1	acknowledged (1) 101:7	135:16;160:16;175:22; 190:12;196:3;201:16; 202:20;235:17	advice (1) 119:1
A	acknowledgment (1) 96:19	add (7) 10:24;19:9;26:1;126:2; 137:3;159:5;204:17	advise (1) 80:3
ability (2) 18:24;33:20	acquaintances (1) 10:2	added (1) 32:17	advisement (2) 234:8;235:3
able (14) 25:10,20;28:17;32:22; 46:5;47:12;50:1,1;71:24; 88:14;100:3;111:19;199:19; 226:4	acquainted (1) 36:2	adding (4) 61:19;136:25;165:8,9	advising (2) 38:17;191:8
above (13) 92:5,15;126:5;150:23; 151:4,6,14,15,17;160:17,18; 162:24;164:6	acre (6) 193:22;194:5;205:7,8,14; 223:3	addition (2) 165:5;182:24	aerial (1) 68:18
absence (2) 74:18;207:4	acreage (21) 18:6,7;21:3;118:5,22; 132:6,11,15;141:16;178:7, 14,16,20,25;192:1,9,22; 193:13;199:16;207:14;228:3	additional (21) 23:8;43:19;52:24;53:3; 102:15;114:4;122:22;171:2; 175:6,14,17;176:12,16; 177:1,4,5,21;178:1,4;181:15; 211:24	affected (1) 198:17
absolute (1) 20:18	acre-feet (36) 42:25;43:3;52:5,7,12,21, 24;54:25;55:10,17,23;56:16; 57:15,17,20;58:13,19;74:17; 76:16,20;78:5,7;83:16;85:1, 10,14,15,19,19,23;87:1; 113:8,15,25;114:5;128:24	address (5) 23:24;34:2;65:4;231:25; 232:1	AFRD (1) 20:15
accept (1) 36:1	acres (122) 55:3,11,12,14;56:1,3,18; 57:19,22,25;58:2;69:15; 72:12,20;74:12,19,23;88:24; 101:21,23;102:4;118:10; 122:2;123:11;129:17; 132:16,19,25;133:22;134:3, 6,9;136:17;137:1,3,10;138:2, 6;139:2,6,9,16;140:3,11,12, 17,23;141:3,18;142:14,17, 17;143:6,9,21;154:23,25; 155:1,17;156:3,7,12,17,19; 157:9,14;177:24;178:1,6,12, 23,24;192:3,12,13;193:6,14, 20,25;194:14,16,21,24; 195:3,3,11,21,22;196:1,2; 198:4,8;203:13,14,22,23; 204:1,2,4,7,10,14,16;207:10; 215:9,13,14,18,20,21;216:1; 221:24;222:5,7,7,23;223:4,7, 8,10;226:23;227:24	addressed (3) 27:21;31:14;109:23	AFRD2 (2) 186:19;187:17
acceptable (1) 28:10	acres-foot (7) 76:13,15;83:23;85:2; 114:18;115:2;194:5	addresses (1) 17:5	afternoon (4) 110:9;116:3;124:20; 219:21
accepted (3) 18:7;36:18;108:10	access (1) 127:1	adjourn (2) 230:7;236:5	again (30) 15:13;24:25;32:23;35:13; 41:15,21;74:4,21;77:21; 82:23;84:18;88:1,10;93:9; 94:9;101:13,25;115:4,10; 146:25;164:24;165:2; 170:15;171:12;173:2,7; 186:1;200:18;206:9;222:17
access (1) 127:1	accommodate (1) 31:4	adjourned (1) 236:7	against (1) 147:14
accommodate (1) 31:4	according (1) 115:16	Adjudication (1) 138:16	ago (8) 17:16;44:3;45:7;74:22; 85:8;134:6;181:7;185:15
according (1) 115:16	account (15) 91:4,7,8,10,11;92:6;100:3; 167:5,13,16,18;168:8; 201:16;202:7,14	adjust (4) 62:2,3;157:8;183:18	agree (22) 52:22;55:13;56:15; 110:12;112:10,16,20;113:1, 7;114:15;139:3;142:20; 163:16;164:7;165:11;195:9; 205:12;214:1;225:8;233:9, 17,21
account (15) 91:4,7,8,10,11;92:6;100:3; 167:5,13,16,18;168:8; 201:16;202:7,14	accounted (2) 92:18;168:16	adjustable (2) 90:15;152:13	agreeable (1) 23:12
accounted (2) 92:18;168:16	accounting (2) 129:19;187:6	adjusted (4) 90:17;145:7;153:12; 186:22	Agreed (2) 139:4;221:10
accounting (2) 129:19;187:6	accounts (1) 99:25	adjustment (6) 23:17;31:6;61:23;168:10, 14;205:13	agreement (5) 115:5;117:3;147:23; 205:20,25
accounts (1) 99:25	accrual (1) 58:12	administrative (3) 17:1;45:14;172:22	agreements (1) 101:24
accrual (1) 58:12	accrue (5) 43:1,3,12;58:20;61:6	admission (11) 29:2,5,7;36:14;59:9; 109:18;146:21;149:19; 180:17;185:24;186:1	ahead (9) 60:9;66:14;155:7;193:9; 209:3;216:11;229:20;231:8; 235:10
accrued (1) 58:18	accuracy (6) 123:18,23;131:24;155:25; 225:6;226:3	admit (9) 29:11;40:9;109:15;124:1; 135:24;180:14;185:14; 230:9,12	air (3) 156:4,9;235:13
accuracy (6) 123:18,23;131:24;155:25; 225:6;226:3	accurate (11) 136:21,22;142:22,23; 155:6;181:14;182:5;195:5, 10;214:11;225:9	admitted (5) 59:4;135:18;148:25; 149:10,13	al (7) 11:11,21;12:14;13:1,3; 96:23;219:22
accurate (11) 136:21,22;142:22,23; 155:6;181:14;182:5;195:5, 10;214:11;225:9	accurately (5) 187:13;188:20;224:9,11; 225:3	admitting (1) 230:21	aligned (1) 34:15
accurately (5) 187:13;188:20;224:9,11; 225:3	achieves (2) 143:18;200:17	admission (11) 29:2,5,7;36:14;59:9; 109:18;146:21;149:19; 180:17;185:24;186:1	Allan (1) 44:8
achieves (2) 143:18;200:17	actually (16)	administrative (3) 17:1;45:14;172:22	

allocating (1) 86:17	analyze (2) 75:5;198:22	applies (3) 208:20;209:20;231:18	22:19,21,22;23:2;33:25; 38:18,20;69:4,4;197:8; 199:21;202:3
allocations (3) 213:25;214:16,22	analyzing (1) 183:15	apply (4) 19:16;154:23;155:17; 210:7	argue (2) 210:9;232:9
allotted (1) 24:4	ANDERS (40) 7:2;12:25,25;53:18;54:20; 64:19,20;66:4;67:2;73:14; 78:22;81:16,22;82:25; 119:15,18,25;120:4;122:22; 124:12,14,20;133:24; 137:23;145:13;148:12,14; 149:6,24;161:14,18;166:18, 22;180:19;196:7;203:6; 211:3;219:16,21;228:24	applying (3) 43:20;126:24;199:22	argument (1) 21:14
allow (5) 22:22;33:13,15;104:4; 148:18	A-n-d-e-r-s (1) 120:5	apportion (2) 85:9;114:22	arguments (1) 21:15
allowed (2) 87:21;100:4	ANDERSON (32) 12:7,7;20:7,8,9;95:9,10, 12;96:12;149:25;150:3,9,13, 16,20;155:11;157:19;160:1; 161:8,11,12;229:22,23,24; 230:5,25;231:9;233:6,19,20, 21;234:7	apportioning (1) 101:16	Army (2) 162:17;167:8
almost (4) 50:14;111:25;188:23; 206:13	Anderson's (1) 230:7	appreciate (16) 11:2;30:14;31:2,5;32:5,23; 36:4;67:25;73:10;87:7; 160:15;168:13;169:5; 197:23;206:14;232:18	around (7) 57:22;166:7;175:21; 178:24;192:12;193:25; 210:22
along (2) 67:11;191:12	Andrus (1) 12:17	appreciated (1) 101:4	arranged (1) 10:8
altering (1) 19:21	announced (1) 172:8	apprised (3) 30:12;32:21,22	arrangement (1) 15:3
alternative (8) 131:4;189:15;190:19; 191:2,9;231:6;232:15;233:3	annual (1) 55:20	approach (6) 18:16;86:17;109:1,12; 190:20;193:20	As-Applied (16) 16:22;41:7,9;52:1;83:8,9; 86:14;98:20;101:1;107:24; 113:10;150:17;209:11; 214:17,23,24
alternatives (1) 189:19	annually (2) 118:4;227:3	approached (1) 194:1	as-applieds (1) 137:5
although (1) 16:12	anomalous (2) 35:8;165:22	approaches (1) 108:24	Aside (3) 80:2;82:7;200:21
altogether (1) 69:8	answered (2) 103:18;225:20	appropriate (10) 23:4;42:20;98:7;103:9; 104:14;108:21;109:8; 110:20;205:13;232:22	aspect (1) 169:12
always (7) 46:4;47:22;48:1;127:19; 130:10;210:11;227:19	anticipated (1) 16:2	appropriation (8) 22:5,15;81:9;115:16,18; 208:13;234:25;235:2	aspects (5) 81:18;94:19,21;175:8; 232:13
Amalgamated's (3) 26:19,20;31:16	anticipating (1) 105:7	appropriator (2) 81:7;208:11	asserting (2) 147:15,20
Amended (11) 7:11;24:10,25;25:17; 41:23;65:25;66:17;116:13; 135:12;136:25;137:6	anymore (1) 143:14	Appropriators (4) 12:10,12;17:14;63:13	assign (1) 70:17
amending (1) 170:6	apologize (5) 99:17;135:19;137:25; 173:12;202:23	approved (1) 102:5	assigned (4) 23:16;24:20;84:3;183:24
American (2) 11:13;165:19	Apparently (1) 228:23	approximately (16) 42:25;43:3;52:21;53:3; 54:24;55:12,25;57:15;58:1, 2,13;72:23;74:14,20;112:2, 19	assignment (2) 56:23;170:5
among (6) 85:10;165:14,16;172:24; 173:3;180:10	appear (2) 30:7;31:24	April (23) 7:13,18;40:25;41:9;42:5; 51:24;57:5,8;58:11;76:11; 83:9;94:5;95:22;137:4; 162:12;164:18;184:21; 188:15;206:19,20;207:5,6; 214:9	assignments (1) 169:17
Amoth (1) 19:12	appearing (1) 156:19	Aquifer (17) 50:11,15;53:1;69:9,10; 74:3;75:1,25;90:4,13,15,18, 18,19;93:14;117:2;127:2	assist (3) 57:7;95:25;96:8
amount (9) 43:12;47:8;52:2;58:18; 62:6;73:19;98:18;100:5; 126:15	appears (2) 136:14;230:5	area (19) 20:20;58:22;69:14;74:5; 75:2,2;82:17,18;93:14,19; 103:19;118:11;140:6; 191:21,24;194:10;198:12; 212:8;216:4	assisted (1) 42:10
analogy (1) 201:8	application (8) 71:3;72:13,14,19;74:25; 126:20;127:16;211:9	areas (12)	associated (4) 60:24;62:7;128:3,23
analyses (12) 72:8;98:4;104:25;143:13; 169:16,18;175:14,17; 176:12;177:2;192:12;209:16	applications (1) 109:3		Assume (4) 35:14;117:25;124:2; 158:16
analysis (31) 22:4;77:9,10,13,14,19,21; 78:1,14;79:23;82:1,8;85:12; 98:7;104:21;108:15;109:7; 114:14,23;140:3;156:13,15; 177:4,22;181:11;192:8; 194:9;198:24;199:25; 211:18;226:1	applied (9) 109:9;126:18;127:8; 157:12;199:9,10;209:24; 210:6,23		assuming (4) 31:25;53:1;59:19;229:2

Attachment (2) 7:22;76:4	away (4) 79:9;80:5;105:24;188:23	84:1,14,20;85:9;88:14; 172:20	65:13;182:8
attempt (4) 23:21;24:8;29:24;30:10	B	bear (1) 40:16	Bingham (3) 12:7;13:1;20:11
attempted (2) 23:24;211:23	bachelor's (2) 37:11;120:7	bearing (1) 109:12	bit (12) 17:16;25:9;50:9;60:19; 121:10;154:21;157:17; 170:12;208:17;224:4; 225:18;231:19
attempting (1) 16:25	back (37) 12:19;17:1;29:21;33:15; 41:14;45:13;52:1;54:23; 57:18;58:11;60:19;66:9; 72:25;87:23,25;105:18,18, 21;106:13;113:11;116:18; 117:20;156:18;160:2;169:3; 181:6;185:14;186:9;192:21; 196:12,15;201:17;203:1; 214:25;217:16;220:13; 222:17	became (3) 25:19;171:12;226:14	Blackfoot (20) 43:4;47:9;52:12;55:17; 75:23;77:1;78:6;90:5,10; 92:9,12;101:8;110:21; 113:16,24;163:11,15; 164:22;167:5,14
attend (2) 217:13;218:2	backed (1) 215:17	become (5) 54:1;158:9;168:15,24; 225:13	Blackfoot (20) 43:4;47:9;52:12;55:17; 75:23;77:1;78:6;90:5,10; 92:9,12;101:8;110:21; 113:16,24;163:11,15; 164:22;167:5,14
attendance (2) 54:4,6	background (4) 35:23;37:10;50:9;120:6	becomes (3) 126:24;193:11;207:2	block (1) 76:22
attendees (2) 54:7,13	backwards (1) 179:14	becoming (1) 225:9	blessed (1) 143:24
attention (8) 19:11;80:22;81:5;121:5; 122:23;134:4;181:3;202:20	bad (1) 157:2	begin (3) 17:15;116:21;188:4	board (1) 145:15
attorney (8) 11:6,11,12;14:21;34:13; 84:1;88:5;232:22	ballpark (1) 55:15	beginning (1) 33:10	Boise (1) 17:18
attorneys (7) 13:14;14:8,21;15:5;84:5; 218:1;223:1	bar (1) 73:5	begins (1) 117:24	bolster (2) 232:5,6
attributable (1) 77:6	Barlogi (7) 30:25;144:5,15,19;229:2, 12,16	behalf (11) 11:16,23;12:2;13:18; 17:14;19:8;39:24;63:12; 65:19,22;213:11	Bonneville-Jefferson (2) 12:5;26:11
audible (1) 216:14	barred (1) 18:3	behind (2) 24:2;30:8	bookmark (1) 185:12
August (7) 53:11;170:5,17;172:7; 173:10;217:25;227:11	based (27) 18:18;19:1;33:16;34:10; 44:15;52:10;71:21;86:8; 99:21;101:16;104:23; 113:16;132:8;134:21; 143:16;177:24;178:7,19,25; 181:11;182:21;194:6; 200:25;205:7,14;224:8; 227:15	belabor (2) 40:22;136:19	books (1) 234:23
authored (1) 173:21	Baseline (17) 122:1;146:16;151:5,22; 152:12,20;153:7,11,17,20, 22;170:22;171:14;176:1,6; 206:16,23	below (6) 126:25;151:7;163:15,20; 165:15;210:10	both (4) 48:3;70:3;163:20;231:18
authorizes (1) 204:6	basically (1) 79:5	beneficial (6) 28:12;160:20;204:12,21; 211:19,24	bottom (13) 76:14;78:2;83:13;85:18; 125:11,13;134:5;140:10; 183:9;186:21;203:22; 208:10;215:12
authors (1) 182:14	Basin (8) 92:12;138:16;164:19; 167:6,19;168:3,5;211:10	benefit (15) 26:6;78:6,25;79:12;80:6,9; 82:2,5,9;86:2;168:25;231:4, 13,17;234:2	boundaries (2) 22:25;88:21
automate (1) 226:1	basins (8) 92:1,12;163:4;164:6; 165:5,23;167:14;210:23	benefits (11) 22:17;79:1,3,22;108:17, 20,22;111:2,3;234:15,21	boundary (1) 125:16
automated (1) 226:4	basis (8) 17:6;63:22;98:6;104:17; 130:18;145:17,24;193:12	best (18) 18:18;31:4;69:17,19; 70:21,25;89:8;90:17,91:12; 108:10;166:8;200:15,22; 201:4,4,7,13;217:22	Box (11) 171:5,13,16;181:16,23; 188:8,10,11,16,25;189:8
availability (1) 31:6	Bates (1) 40:20	better (7) 99:24;187:9,10,12;189:12; 214:8;223:12	brand-new (1) 142:6
available (12) 18:18;31:3,17;69:17; 70:21;71:15;108:10;127:3; 197:6;226:14;227:2,22	Baxter (6)	beyond (6) 17:9;23:2;71:13;82:18; 98:9;232:1	breach (1) 205:25
average (9) 55:20;145:7;150:23;151:4, 6,7,14,15,17		BID (2) 186:19;187:17	break (8) 28:15;60:6;87:18,20,22; 196:8,10,12
averages (1) 63:4		Big (2) 210:8,14	breakdown (1) 87:3
averaging (1) 100:2		binder (8) 39:15,25;42:3;106:12; 107:2;125:2;135:4;179:6	breaking (1) 230:6
aware (33) 18:1;24:19;38:16;50:9; 54:1,3,6;68:21;75:20,21,24; 79:18;81:4;89:11;111:8,21; 121:19;128:22;129:3; 141:23,24;159:15;164:17; 167:19,23;172:19,23; 201:18;205:19,23,24;206:1,5		binders (2)	BRICKER (11) 11:15,15;59:15,17;110:3, 3,4,6,8;113:1;115:21
awareness (1) 111:11			brief (3) 42:7;53:11;231:3
			briefly (6) 16:17;20:9;68:1;179:24; 182:16;209:23

<p>bring (2) 23:9;181:3</p> <p>BROMLEY (14) 11:19,19,20;28:13;212:23, 24;213:1,4,6,10,11;216:6; 229:10,11</p> <p>brought (3) 34:12;122:22;209:9</p> <p>Bryce (1) 11:24</p> <p>Budge (84) 7:6;12:9,9;17:12,13,13; 23:18;35:19;36:19;41:4,7; 63:9,11,12;65:10,13,14,15; 66:5,9,10;76:2;80:13;84:8, 12,13;87:14,17;88:8;100:23; 103:5,10,15,18;104:2,9,15, 18,19;105:5;115:25;116:2,8; 119:4;135:4;148:1,2,3,9; 149:8,9;166:19,21,22;169:3; 179:5;180:14,24;182:7; 184:16;185:13,18,19,22; 186:6,7;190:7,9;196:6,9,15, 16;202:19;206:12;207:16; 208:3;211:2,7;212:18,21; 215:12;224:21,23;228:16</p> <p>Budge's (1) 103:22</p> <p>budget (2) 89:4;99:21</p> <p>built (1) 188:22</p> <p>bullet (6) 51:6;134:3;203:25;204:2, 12,15</p> <p>burden (4) 114:19;115:4,10,13</p> <p>burdensome (2) 114:16,25</p> <p>Bureau (6) 15:13;120:21;121:2; 162:15;167:7;211:5</p> <p>business (1) 10:16</p> <p>button (1) 228:5</p>	<p>calculating (6) 62:20;99:25;108:22; 154:10,20;199:13</p> <p>calculation (19) 42:12;49:3;61:1;83:16; 89:3,20;90:2,92:15;100:24; 101:5,10;129:11;130:8; 131:5,25;134:10;153:4; 176:1,7</p> <p>calculations (9) 21:8;38:23;42:14;92:10; 99:12;130:9,14,15,17</p> <p>calculator (4) 134:13,18,22;228:15</p> <p>calibrate (4) 89:2;90:9;128:14;141:22</p> <p>calibrated (2) 46:24;48:3</p> <p>calibrating (1) 89:16</p> <p>calibration (21) 60:20,22;61:3,4;62:15; 68:9;69:20;89:4,6,7,23,25; 90:11,14,22;91:16;92:2,13, 15;100:6;122:5</p> <p>call (47) 10:15,17;13:4,13,21; 38:24;42:13;48:14;53:14; 70:3;73:22;81:21;103:9; 104:14;110:1;116:4;122:24; 134:13;144:15,18,19;145:3, 7;160:11;162:16;166:23; 175:5,6;196:8;197:4;198:17; 202:3;205:22;208:19,20,22; 209:20;210:1,3,5,11,15,22; 211:10;216:25;217:7,16</p> <p>called (5) 20:10;21:22;29:21;83:8; 121:16</p> <p>calling (1) 160:15</p> <p>calls (3) 82:13;211:6;212:4</p> <p>cam (1) 51:18</p> <p>came (14) 16:9;64:8,11,18;95:22; 96:4;133:2;141:1;177:6; 180:25;192:20;193:19,25; 195:19</p> <p>can (91) 10:10;14:9,23;15:4,8,8; 24:2;25:13,22,23,24;27:19; 28:7;30:12;31:4,4;32:4; 33:25;35:11,16;36:13,13; 37:7;40:13;41:22;42:7;46:2, 10;49:1;50:3;51:21;52:15; 55:5;57:3;61:14;62:5;68:6; 73:12;80:25;82:15;85:16; 105:1;107:21;112:15; 114:22,24;120:2;127:1; 134:23;141:10;147:10; 148:22;152:7,25;153:9;</p>	<p>154:2,3,8,8;156:2;157:1; 158:7;160:2,8;165:14,15; 181:19;183:13;186:15; 187:2,16;188:22;190:17; 192:21;194:12;195:7; 196:19;197:3;199:1,10,23; 203:23;209:23;210:9; 216:13;217:2;218:6;222:5; 226:22,25;227:8</p> <p>Canal (70) 42:19;43:1,6,13;55:1,10, 24;56:16;57:14;58:12;60:24; 62:7;73:16,17;89:18;99:6; 122:13;128:4,13,23;132:10, 11,15,24;136:17;137:11; 140:9;141:15;144:3,6,20; 145:1,10,18,24;146:4,13,16; 147:14;164:3,6;165:12; 168:22;171:19;178:13; 181:9,11,17,21;183:12; 186:19;187:17,24;189:10; 190:21;192:11;193:19,21; 194:6;201:10;221:7;222:2,8, 23;223:3,7;224:5,10,12; 225:2</p> <p>canals (1) 126:14</p> <p>Candice (27) 13:7,8,10,10,23;14:9,11, 18;25:4,23;26:6,14;27:4,5, 24;31:12;32:1;39:10,23; 40:5;41:4,16;60:11,18; 216:10;235:7,20</p> <p>Canyon (11) 171:6,13,16;181:16,23; 188:8,10,12,16,25;189:8</p> <p>capabilities (3) 35:24;71:22,23</p> <p>capable (5) 47:7;48:21;71:5,16,18</p> <p>captured (2) 168:22,23</p> <p>care (1) 100:14</p> <p>Carey (1) 79:19</p> <p>carryover (16) 17:25;41:25;66:2,19; 116:15;122:11;135:14; 175:21,25;176:3,7,9,13,16; 177:22;184:21</p> <p>case (13) 10:15;16:21;17:16;19:12; 20:13,14,15,16;59:5;71:3; 127:10;187:9;232:16</p> <p>cases (4) 92:3;107:13;231:20; 233:13</p> <p>categories (3) 221:20,23;222:6</p> <p>category (2) 10:3;157:8</p> <p>cause (5)</p>	<p>37:1;106:8;114:17;115:2; 119:20</p> <p>caused (1) 79:8</p> <p>causing (1) 189:1</p> <p>CDL (2) 68:16;139:8</p> <p>ceiling (1) 106:2</p> <p>centered (1) 175:21</p> <p>certain (4) 188:4;206:24;221:11; 233:7</p> <p>certainly (8) 18:1;21:1,6,11;75:25; 226:8;232:8;233:24</p> <p>cfs (1) 90:25</p> <p>chance (2) 19:9;228:21</p> <p>change (35) 10:12;18:13,19,19;19:1, 25;21:1;25:13;29:13;44:17, 20;45:15,22;47:20;64:14,15; 71:2,20,22,24;95:21;115:13; 152:14,19,19,22;153:5,12, 13;188:21;189:13;202:21; 206:16;207:8;232:11</p> <p>changed (8) 19:17;47:16;134:18; 152:24;153:22;175:8; 178:17;189:10</p> <p>changes (10) 18:19,23;20:25;153:14,25; 154:7,11,18;211:20;212:1</p> <p>changing (3) 44:12;45:10;153:20</p> <p>channels (1) 99:19</p> <p>characterization (2) 103:25;129:2</p> <p>characterize (6) 10:2;33:15;34:18;102:17; 127:6;234:8</p> <p>characterizing (1) 146:25</p> <p>chart (1) 73:5</p> <p>check (1) 14:7</p> <p>check-in (2) 170:2,13</p> <p>checking (1) 31:19</p> <p>chief (2) 120:22;121:2</p> <p>choice (1) 14:24</p> <p>choosing (1) 151:22</p> <p>Chris (3)</p>
<p style="text-align: center;">C</p> <p>calculate (21) 60:25;61:25;69:10,12; 70:16;84:2;90:2;92:6; 129:17;130:24;131:12; 132:2;153:5;154:17;166:3; 167:10;178:2;193:3;199:18; 202:17;222:5</p> <p>calculated (14) 51:23;52:9;57:9,10;61:16; 72:8;83:21;92:16;101:9; 113:13;145:6;177:25;187:4; 193:7</p> <p>calculates (1) 92:20</p>			

<p>11:19;14:15;213:11 Christmas (1) 174:12 circle (2) 33:15;222:16 circumstance (1) 172:4 circumstances (2) 18:19;20:1 citations (1) 234:12 cited (3) 20:13;231:22;232:3 cites (1) 197:4 Cities (14) 11:20,20;12:2;25:20; 26:11,23,23;28:1,4;39:24; 65:23;131:3;213:12;217:19 Cities' (1) 39:14 City (12) 11:16,18,23;12:3;19:8; 30:21;60:16;65:23;88:6; 124:21;147:13;161:19 civil (1) 37:13 claim (1) 18:14 claims (3) 147:14;204:13,21 Clarification (4) 36:17;73:9;197:23;216:10 clarified (1) 36:15 clarify (10) 28:21;32:7;59:15;70:9; 73:4;104:5;178:22;192:25; 218:9,21 classification (1) 24:18 classifications (2) 69:1;194:23 classify (2) 88:21;141:13 Clear (21) 20:13;142:2;143:18,19,21, 22;154:22;155:4,15,16,17; 156:2,23;157:5,9,11;173:12; 199:2,23;200:3,18 clearly (1) 111:5 clients (1) 102:12 close (1) 167:23 closely (2) 33:9;171:21 closer (1) 187:8 closest (2) 79:7;210:8 cloud (1)</p>	<p>227:15 Clouds (2) 227:16,17 Coalition (77) 10:15;11:20;26:13,21,23; 33:11,19;34:22;39:14,24; 49:3,11;53:7,13;65:23;66:3, 20;78:12,25;79:22;80:6; 82:3,10;85:23;86:20,23; 96:16;98:12;102:11;106:12; 110:16;114:12;115:20; 116:18,21;117:1,11;118:4,8, 9,9,17;125:16;133:22; 137:22;138:2,14,21;140:8; 149:6;159:16;165:7;168:16; 178:7;181:14;198:23;202:2, 9,16;203:4,15;205:21;206:6; 211:25;213:11,24;214:1,8; 216:21,25;217:16,19; 219:16;220:8;228:22; 230:15;233:7 Coalitions (1) 17:21 Coalition's (3) 38:24;140:11;205:21 Colleen (7) 10:19,22,25;41:15;88:1; 105:17,22 College (1) 120:8 Collin (2) 144:15,16 Colorado (1) 106:22 column (26) 76:11,13,14,15,24;77:3,4, 6;78:1;85:14,25;86:1,2; 134:8;138:5,9,10,11,18; 139:2,5,7;140:2,16,22,22 columns (3) 76:13,23;77:8 COLVIN (14) 12:15,15;106:3,5,6,10,19, 20;109:22;110:9;116:3; 119:7,10;230:17 C-o-l-v-i-n (1) 106:20 combination (1) 70:24 combined (1) 149:16 Coming (6) 54:23;61:10;90:4;168:9; 180:19;230:5 command (2) 81:7;208:11 comment (4) 32:6;33:22;104:16;148:1 Comments (15) 65:19,22;176:11;179:9,15, 19,25;180:1,6;182:25;183:1; 189:24;220:7,10;230:15 Commissioners (1)</p>	<p>145:15 Committee (3) 107:16;117:5,14 commodity (1) 20:20 common (25) 24:6,23;25:3,17,19,23; 26:5,7,10,12,17;27:2;28:8, 17;40:8;58:22;65:13;68:16; 74:6;75:3;93:14,19;135:5; 179:6;198:12 communicate (1) 181:2 communicated (1) 64:23 communication (1) 229:5 companies (5) 171:18;189:6;199:21; 216:2;221:7 Company (55) 42:19;43:1,13;55:1,11,24; 56:16;57:14;58:13;60:24; 62:7;73:16,17;89:18;99:6; 128:4,13,23;132:10,11,15, 25;136:17;137:11;140:10; 141:15;144:3,6,21;145:1,10, 16,25;146:4,13,16;147:14; 164:3;165:12;168:22; 171:19;181:9,17;183:12; 186:20;187:18;192:11; 193:21;194:6;201:10;222:2, 8;224:10,12;225:2 Company's (9) 43:6;122:13;145:18; 164:6;181:21;222:23;223:3, 7;224:5 comparative (1) 22:4 comparatively (1) 197:25 compare (1) 130:12 compared (5) 82:2,5;115:5;130:13; 156:14 compares (2) 74:23;82:8 comparing (3) 55:6;181:12;234:3 comparison (7) 22:13;51:23;52:9;72:7,12; 97:14;113:12 compelling (1) 18:25 compile (1) 60:23 compiled (2) 26:3;217:5 compiling (1) 61:9 complete (3) 49:23;175:3,5</p>	<p>completed (5) 97:14;174:20;177:23; 195:9,14 completely (2) 21:12;49:23 compliance (1) 211:5 complicated (1) 199:7 comply (1) 172:13 complying (3) 81:3;172:21;209:4 component (6) 18:4;21:24;69:21;108:18; 118:25;126:8 components (12) 18:14,15,24;19:1;22:9; 62:1;90:16;91:3;170:19; 176:25;188:4,5 composed (1) 129:16 compound (1) 112:25 compounds (1) 21:5 comprehensively (1) 17:4 compress (2) 30:6;32:20 compromise (1) 234:25 compromises (1) 33:20 concept (8) 82:12,21;125:19;152:12; 153:11;208:16;212:3,7 concepts (2) 209:8,17 concern (5) 172:13;184:4;187:25; 188:2,23 concerned (6) 33:25;86:25;171:12; 184:10,12;224:13 concerning (3) 174:1;205:25;206:3 concerns (8) 39:2;40:14;122:19;182:2; 183:25;184:6,8;187:23 conclude (1) 151:13 conclusion (4) 56:10,11,12;98:1 conclusions (7) 97:5,7,12;98:5;108:4; 231:11,11 conclusory (1) 232:23 condition (1) 191:20 conditions (10) 19:14,17;50:21;147:1;</p>
--	--	---	---

<p>152:13,18;153:12;156:14; 191:25;198:21 conduct (1) 177:1 conducted (2) 176:16;211:18 conference (3) 54:12;172:8;217:23 confidence (1) 224:16 confirm (1) 62:6 confused (4) 40:10;99:16;154:22; 173:10 confusing (2) 25:15;215:23 confusion (2) 23:14;135:22 conjunction (1) 69:11 Conjunctive (5) 80:15,19;207:17,20;209:7 connect (1) 74:15 connection (7) 66:24;75:9,11;180:11; 209:9,10;212:9 consider (15) 18:23;21:7;101:20;102:3; 146:17;155:3;156:24;157:4; 167:9;189:11;197:3;209:6; 220:10;234:5,14 consideration (4) 98:25;142:12;147:21; 233:25 considered (6) 22:2;156:3,18;165:21; 180:11;210:2 consist (1) 175:19 consistency (1) 195:23 consistent (2) 78:15,18 consists (3) 67:12;68:6;194:12 consolidate (1) 23:21 consolidation (1) 23:24 constant (2) 187:19;193:17 consultant (1) 118:8 consultants (9) 131:2;174:20;182:19,25; 214:6;219:5,7;220:8,11 consulted (1) 119:1 consuming (1) 69:6 contain (1)</p>	<p>132:16 contained (2) 36:16;126:6 contemplated (1) 20:25 contesting (1) 34:8 context (5) 17:25;77:20;103:21; 197:3;211:13 continue (3) 60:7;85:16;175:13 Continued (3) 7:1;170:4;177:1 continues (2) 31:24;189:17 continuing (1) 51:14 continuous (3) 25:1;52:19;170:8 continuously (1) 55:21 CONTOR (2) 11:24,24 contract (4) 145:14;146:11;147:4; 148:11 contractor (1) 120:19 con-transient (1) 232:12 contrary (2) 81:9;208:13 contribute (3) 21:25;145:1;174:5 contributing (3) 62:23;188:25;189:4 contribution (3) 91:13;99:5;145:6 control (2) 32:4;130:10 controlling (1) 73:15 convene (2) 105:18;170:18 convening (1) 53:12 conversation (2) 131:18;144:5 conversations (3) 176:23;212:16,17 conveyed (1) 126:13 convincing (20) 142:2;143:18,19,21,23; 154:22;155:4,15,16,18; 156:2,6,23;157:6,9,11;199:2, 23;200:3,18 coordinating (1) 31:2 copied (1) 28:16 copy (4)</p>	<p>17:3;28:12;80:14;185:3 Corps (2) 162:17;167:8 corrected (1) 144:12 correctly (3) 42:17;92:2;166:2 correspondence (1) 172:20 counsel (3) 35:20,21;218:1 count (1) 139:24 counted (1) 194:14 county (2) 31:10;210:9 couple (16) 16:9;43:25;45:7;60:10; 94:4;96:24;103:6;211:8; 213:12;216:10;219:22; 222:19;224:17,24;226:13; 230:2 court (19) 10:18,22;11:3;15:8;18:20; 19:3,12;20:22;21:12;22:12, 13;45:18,21;148:5;183:17; 197:4;232:13;234:14,19 courtesy (3) 87:4;101:14;235:14 courts (1) 234:24 courts' (1) 234:4 cover (2) 33:25;227:15 covered (1) 109:10 Crapo (1) 11:23 create (4) 141:12;164:15;225:20,24 created (17) 46:9;63:23;70:7;138:11, 14,15,23,25;142:21,24; 155:25;200:24;220:15,19, 21;223:23;226:7 creating (4) 19:21;42:8;225:22;228:6 Creek (8) 92:7,11;100:11,13,16; 163:7,18;165:1 Cresto (4) 166:8,10;182:11;188:14 criteria (2) 153:18;171:15 critical (1) 87:8 crop (31) 122:2;125:15,17;129:14, 16;130:4;131:10;151:8,23; 152:23,23;153:2,3,3,6,13,15, 24;154:1,7,7,17,17,23;155:1;</p>	<p>193:3,6,6,7,10,16 crops (3) 160:20;191:22,24 Cross-Examination (21) 7:3,4;35:6;39:21;60:13; 63:10;88:3;95:11;96:20; 109:24;110:1,7;115:24; 116:1;124:18;150:2;161:16; 166:20;213:9;216:16;219:19 cross-reference (1) 28:11 crowd (1) 23:12 cumulative (1) 114:20 curiosity (1) 167:2 curious (1) 150:22 current (16) 46:8,11,16;47:3,12,14; 112:22,23;113:3,4,22; 156:14;191:20,25;223:19; 225:3 currently (6) 37:18,24;68:9;113:23; 120:13;185:22 curtail (4) 56:17;58:16;78:5;114:16 curtailed (20) 42:24;55:3,12,14,15; 57:19;58:1,10;72:13,20; 74:12,24;101:22;110:14; 112:24;113:4;115:1;207:10, 14;234:17 curtailing (5) 21:3;58:21;86:11;108:12, 22 curtailment (71) 21:23;22:18;38:23;42:12, 14,20;43:11;44:13;48:13; 49:4;51:24;52:10,18,19; 55:21,25;57:9;58:8;72:15; 73:2,21;74:1,2,11,18;75:6; 76:5;77:2,7,16,17;78:3,10, 22;79:19;80:4;82:2,5,5,9; 85:20;86:2,21,23;93:7,17,20, 25;97:22;98:16;101:20,21; 102:5;108:15,17,19;109:12; 110:22;111:1,5;112:21; 113:2,14;114:14,19;115:5,8, 14;205:4;207:9;233:23 curtailments (2) 98:11;207:3 cut (1) 22:16 CV (2) 107:7,9</p>
D			
daily (1) 145:8			

<p>Dakota (1) 37:13</p> <p>Darlington (1) 210:10</p> <p>data (51) 18:23;19:2;21:6;38:7; 56:24;62:19;63:3;64:14; 67:11;68:13,14,16,21;69:11, 12;72:17;76:10;77:5;82:6; 85:5;89:4;90:12,17,18; 91:23;98:4;121:14;122:24; 127:25;128:3,14,17;130:16; 141:12;145:4;155:3,5; 156:22;157:3,10;164:15; 171:2;198:22,25;199:1,2; 200:22;218:21;221:17; 227:24;228:13</p> <p>database (7) 197:13,16,19;198:8,10,18; 199:13</p> <p>dataset (90) 68:3,6,23;69:9,13,17,19; 70:7,8,9,11,14,21,25;139:6, 16;140:4,5,13,18,20,21; 141:7,10,18,22;142:1,7,11, 18,22;143:1,4,9,14;155:21; 156:1,3,8;178:23;192:6,7,20; 193:18,24;194:19,23;195:5, 8,13,16,23;196:4;200:9,11, 17,17,23,24;201:2,3,4,4,12, 14;220:14;221:18,19;222:2, 4,9,24;223:3,11,14,25;224:2; 225:20,22;226:7,10,19,21; 227:2,4,16,25;228:6,6,10</p> <p>datasets (9) 68:8;88:9,19;89:1;192:6; 201:9;218:13,21;223:16</p> <p>date (25) 42:12,14,20;43:12;44:13; 49:8;52:19,20;57:9;58:11; 73:13,15,18,24;74:1,11; 77:14;115:17,18;131:13; 138:18;174:10;177:3,18; 205:2</p> <p>dated (5) 145:16;174:9;184:22; 203:6;217:16</p> <p>dates (12) 38:23;49:3;51:23;52:9; 71:14,15;72:7;77:16,18; 93:17,20;113:12</p> <p>Dave (5) 12:15;106:17,19;230:17, 18</p> <p>D-a-v-e (1) 106:19</p> <p>DAVID (4) 106:6,20,20;116:4</p> <p>day (3) 17:17;188:23;235:15</p> <p>days (6) 16:9;29:22,25;30:7;31:3; 124:22</p>	<p>de (2) 82:19;103:20</p> <p>deal (1) 211:5</p> <p>dealing (1) 233:13</p> <p>deals (1) 196:22</p> <p>Dean (1) 31:16</p> <p>decades (3) 79:9;86:6;114:21</p> <p>December (17) 42:19,24;66:4;85:21; 130:20;137:24;157:22; 174:9,14;175:4,13,15;177:2, 7,12;203:6,10</p> <p>decide (1) 87:2</p> <p>decided (2) 128:20;147:18</p> <p>deciding (1) 56:14</p> <p>decimal (1) 187:10</p> <p>decision (18) 17:4;44:14,25;45:1,4,14; 53:23;64:7,10;71:20,25; 95:16;111:18;176:24;197:4; 227:14;232:10;233:4</p> <p>decisions (4) 22:3,12;111:20;234:13</p> <p>decline (1) 184:13</p> <p>declined (1) 187:19</p> <p>decree (2) 147:2,22</p> <p>decreed (5) 20:18;146:5;147:7;223:4,8</p> <p>decrees (1) 148:10</p> <p>dedicate (1) 223:18</p> <p>deduct (3) 100:12,15,19</p> <p>deducting (1) 61:19</p> <p>deem (1) 21:12</p> <p>deep (2) 126:20,23</p> <p>deeply (1) 99:19</p> <p>deficiencies (1) 130:7</p> <p>defined (1) 160:18</p> <p>Definitely (1) 169:19</p> <p>degradation (3) 181:8;184:13;189:1</p> <p>degrade (1)</p>	<p>189:18</p> <p>degrading (2) 224:14,15</p> <p>degree (2) 37:11;225:6</p> <p>delay (2) 31:14;202:23</p> <p>delineate (6) 68:10,11;69:7;84:16; 88:21;226:22</p> <p>delineates (1) 88:12</p> <p>delineation (3) 88:11,12;103:19</p> <p>delineations (1) 88:20</p> <p>deliver (1) 127:18</p> <p>delivered (3) 147:2;168:23;210:2</p> <p>deliveries (3) 145:24;146:13;199:17</p> <p>delivery (19) 10:15;38:24;42:13;48:14; 53:14;73:22;82:13;103:9; 104:14;109:10;145:23; 147:15;197:3;198:17; 199:16;205:21;212:4; 216:25;217:16</p> <p>Delorey (3) 31:16,19;32:9</p> <p>delving (1) 234:22</p> <p>Demand (33) 41:25;51:24;66:2,19; 69:12;70:15;72:21;74:17; 76:12,19;79:13;86:3,8,13,14, 18;109:7;115:19;116:15; 129:15;133:22;134:10; 135:14;137:21;184:21; 192:23;193:12,13,15; 202:15;203:4;206:18;207:1</p> <p>demonstrate (1) 35:24</p> <p>demonstrated (1) 111:6</p> <p>denominator (1) 130:2</p> <p>Denver (1) 106:22</p> <p>deny (2) 19:4,4</p> <p>denying (1) 16:3</p> <p>Department (115) 11:5,7;12:21,23;17:10; 18:7;21:2,7,11;33:8,12,14; 34:11,16,20;35:7;37:19,22; 38:13;39:5;43:19;44:3,4,23; 45:24;63:16,24;65:24;66:23; 77:12;81:16,22;87:1;92:24; 94:22;101:14;105:3;110:13; 111:8,13;117:17;118:5,21;</p>	<p>119:16;120:14,17,20; 121:19;124:11;128:1,3,17; 130:5,23;131:5,18;132:9; 148:6;155:19;156:11; 157:23;160:23;161:3,22; 162:10;164:10;165:5; 169:12;172:4,9,25;173:4,4; 175:13;176:19;180:7,10; 182:1;183:10,14;184:8; 187:22;188:3;189:14;191:4; 193:20;194:1,15;197:6,13, 16;198:20;199:12;200:7; 205:6;209:19;210:18; 211:18,23;212:12;215:17; 220:10,14;223:2,6;228:8; 231:24;232:7,8,10;233:3,24; 234:3,14,20</p> <p>Department's (9) 33:5;54:17;67:12;86:25; 132:23;142:20;146:5; 187:24;197:9</p> <p>depending (3) 22:23;127:3;229:6</p> <p>depends (1) 168:25</p> <p>depleting (1) 113:24</p> <p>deposit (1) 14:23</p> <p>deposition (8) 45:6,9;68:2;69:22;132:5, 15,22;141:25</p> <p>depth (1) 19:10</p> <p>deputy (1) 34:13</p> <p>derived (1) 141:17</p> <p>describe (6) 69:24;107:4,9,21;108:3; 179:24</p> <p>described (5) 43:15;62:8;81:10;109:6; 208:14</p> <p>describes (1) 145:23</p> <p>deducting (1) 62:21</p> <p>DESCRIPTION (1) 7:9</p> <p>descriptions (2) 41:2,2</p> <p>descriptive (1) 147:7</p> <p>designated (3) 26:4;36:9;161:22</p> <p>designation (1) 82:17</p> <p>designations (1) 68:15</p> <p>designed (1) 221:1</p> <p>desire (1)</p>
---	---	--	---

16:10 detail (1) 108:8 deterioration (1) 171:22 determine (7) 55:5;90:25;110:13,20; 153:14;197:7;233:15 determined (3) 42:18,19;99:22 Determining (11) 41:24;43:11;66:1,18; 116:14;133:21;135:13; 137:20;184:20;203:3;234:15 detour (1) 186:8 develop (1) 77:8 developed (8) 11:1;68:9;69:4;166:7; 171:3;188:13,14,17 developing (5) 38:10;56:23;121:13; 180:11;228:1 development (11) 21:25;22:10;67:13;78:21; 81:17,23;105:8;227:23; 231:13,15,15 deviation (2) 166:1,4 dialogue (1) 15:4 difference (14) 44:3,9;48:5,10;55:2;98:14; 140:10;143:8,10;154:12; 160:22,24,25;204:11 differences (1) 111:9 different (25) 47:18;55:6;72:15;75:22, 24,25;114:13;127:14,22; 131:12;135:18;139:8; 141:12;155:14;175:8;183:1; 190:20;192:5,9;201:9; 216:19;218:1;219:5;220:19; 228:3 differently (2) 10:3;132:2 difficult (2) 105:23;227:16 digitized (2) 88:24;142:21 digitizing (1) 143:16 DIRECT (6) 37:5;70:13;106:15; 109:10;119:23;152:25 directed (3) 45:22;64:20;65:5 direction (5) 45:18,18;64:18,22;169:19 directions (1) 169:15	directly (6) 118:23;120:20;121:3; 129:18;165:19;169:21 Director (97) 11:4;14:9;15:24;16:17; 17:13;19:4,7;20:9,21,22; 21:16;24:1,16,19;26:18; 28:19;30:19;32:14;33:4,22; 35:19;36:8;38:17;39:10; 40:4;42:18;44:19;53:11; 54:24;57:7,13;63:22;64:2,8, 11,13,19,24;66:5;72:1; 78:22;79:17;80:4,8;82:25; 88:14;95:9;96:18;103:1; 104:15,22;105:1;106:11; 123:25;136:13;137:8;146:2; 147:8;148:3;153:23;158:12; 159:9;162:10;169:16,19; 170:9,17;172:8;174:2,4,5; 181:2;182:11,23;183:10; 185:13;191:8,12;197:3; 206:8;209:6,16;210:21; 211:7;213:7;216:9;217:8,12, 22;229:4;230:25;231:3; 233:9,17;234:20;235:7,14 Director's (11) 16:21;19:11;45:1;56:12; 59:5;71:20;104:19,24;170:5; 205:18;233:10 disadvantage (1) 25:10 discharge (9) 53:2;61:24,24;62:4;69:11; 90:13;129:15;160:12,12 discharges (2) 61:6;90:20 disclosed (2) 24:9;125:9 disclosure (1) 24:25 disclosures (3) 24:3,5,11 discretion (3) 20:21,22;234:4 discretization (1) 47:20 discuss (4) 39:3;81:18;122:20;214:6 discussed (9) 56:7,8;68:2;69:22;79:15; 95:2;131:23;178:21;185:15 discussing (4) 82:23;100:8;117:9;185:24 discussion (16) 29:14,20,22;79:10,11; 130:22;165:4,25;172:24; 173:3,14;175:11;181:6; 205:6;209:13;231:5 discussions (13) 15:10;56:5;75:15;77:22; 81:15,22;94:21;158:15; 165:8;176:20;205:9;206:2; 214:12	dismissed (1) 228:25 disparity (1) 81:13 dispute (1) 205:24 disregard (1) 200:4 distant (1) 10:5 distinguishing (1) 70:22 distribute (1) 16:5 distributed (1) 28:16 distribution (2) 208:21;210:5 District (37) 11:11,13,14,25;12:6,8,14; 13:2;57:12;75:6,7,17,23; 77:7,22;78:3,5,11,17;79:19, 20,21,21;80:1,3;84:3;85:17; 91:17,24;96:23;101:8,11; 129:21,22;197:4;211:14; 214:13 districts (11) 12:18;77:2;79:24;83:20, 22;84:25;85:11;86:18,21; 101:15;221:8 District's (1) 93:12 diversion (10) 91:23;129:15,16;150:23; 151:4,14;154:8;160:19; 164:7;198:21 diversions (21) 20:23;70:18;91:7;122:14; 129:18,25;151:8,23;160:11, 12,13,15,16,23;161:1,4; 197:17,18,20,21;198:17 divert (2) 151:15,16 diverted (5) 43:9;125:17;126:12; 161:2;181:13 divide (1) 193:10 divided (1) 129:14 dividing (1) 100:24 doctrine (11) 19:13;22:15;81:21;208:19, 23;209:20;210:5;211:10; 233:16;234:25;235:2 document (37) 18:21;25:22;38:5;41:22; 51:11;65:16;66:21,23;67:4, 5;76:3,8;83:10;109:18,19; 116:11;121:8,10;148:6,11, 15;149:20;157:23;173:20, 25;175:4;182:13,16;185:1,	17;186:2,3;190:14;215:2; 220:5;230:21,22 documents (13) 24:21;25:2;33:5;39:19; 40:16;59:9,13;147:11; 179:22;180:17,21,25;181:4 Doherty (1) 10:22 domestic (1) 197:24 done (25) 34:23;65:1;75:11;77:9,10, 13,15,19;88:12;104:21; 116:25;130:6;144:2;156:11; 166:6;175:10;189:18;191:4; 192:8;196:4;206:13;223:20; 227:13,18;228:4 dots (1) 74:15 double (1) 194:14 doubt (1) 54:5 down (12) 117:23;126:25;130:1; 132:1;166:4;191:18;193:14, 15;203:21;207:23;209:1; 210:10 downstream (1) 91:6 downward (3) 157:9;184:13;224:13 draconian (2) 27:20;32:5 draft (10) 42:16;67:5;96:1,8;158:19, 21,23,24;159:4,8 drafted (1) 144:23 drafting (3) 67:3;175:7;176:12 drafts (3) 158:16;159:13;176:22 drainage (5) 163:8,10,11,21;164:22 draw (4) 19:11;80:22;81:5;134:4 DS (1) 113:13 due (6) 108:12,16;114:20;172:13, 21;182:2 duly (3) 36:25;106:7;119:19 dump (1) 122:24 Dunn (2) 11:16,18 duplicate (2) 63:14;169:6 during (19) 45:19;55:24;56:13,17; 62:9;68:2;69:22;78:13,20;
---	---	---	--

<p>90:11;131:17;132:4,14,22; 138:15;141:25;164:11; 176:4;197:9 duties (1) 121:1 duty (1) 31:9 Dylan (2) 12:7;20:8</p>	<p>36:5;39:13;122:9;125:8, 14,19;126:6;129:13;130:1,2, 23;131:1,4,11,22,24;154:9, 13;193:11 efficient (2) 34:1,7 effort (3) 69:6;197:10;223:23 efforts (3) 31:5;32:24;62:16 eight (1) 143:10 either (21) 13:24;14:24;15:17;34:20; 35:14,16;46:21;68:11;70:17; 88:22;90:20;92:11;121:3; 127:8,10,21;137:4;140:7; 151:24;168:13;169:21 electronic (1) 13:22 electronically (1) 10:9 elements (3) 147:12,19,20 Elesheva (3) 23:25;25:4;28:18 Elisheva (1) 12:11 else (8) 13:25;32:22;36:21;89:9; 167:15;193:17;199:3;235:6 elsewhere (2) 112:9;161:7 email (6) 84:14,19,24;177:3,11,20 emailed (1) 217:25 emergency (1) 172:3 employ (1) 103:23 employed (2) 37:18;120:13 employee (1) 119:15 employees (1) 218:9 enable (1) 227:23 encourage (1) 36:5 end (8) 46:21;91:5,6;127:17,19; 152:10;177:23;207:9 ended (1) 159:21 engaged (1) 60:5 engineer (2) 37:15,24 engineering (1) 37:13 Engineers (6)</p>	<p>12:2;162:17;167:8; 179:15;180:1;192:8 enlargement (11) 204:15,21,23;205:1,10; 215:13,14,18,21,22;216:1 enough (8) 10:25;34:25;50:3;51:20; 128:20;169:3;205:17;235:12 ensure (4) 30:10;123:18;151:8,23 entered (1) 147:17 entire (3) 29:10;100:15;161:1 entirely (1) 70:10 entirety (3) 14:2;81:7;208:11 entities (5) 197:8;198:23;201:19,25; 202:16 entitled (2) 81:7;208:11 entity (5) 125:17;160:19,21;181:14; 202:9 entity's (1) 125:16 Environmental (2) 11:25;37:11 Ep (1) 129:13 equal (1) 129:14 equation (16) 126:4,5;129:10;131:21; 171:17,23;181:8,20;186:20; 187:6,13,23;193:4;224:6,9; 225:1 equivalency (2) 164:10,17 equivalent (1) 168:2 Erickson (1) 19:12 error (2) 111:6,17 errors (1) 131:25 ESPA (17) 12:2;38:22;42:11;51:1; 57:10;61:5,23,24;62:4;68:3; 108:11;109:2;112:11,17; 114:21;198:12;211:20 ESPAM (18) 45:25;46:2,4,6,8,11;47:21, 21,25;70:12,14;71:15,17; 89:2;99:20;108:9,15;110:13 ESPAM2 (1) 46:16 ESPAM2.1 (5) 46:17,20,23;48:1,19 ESPAM2.2 (5)</p>	<p>46:14;47:3,22;48:1;108:21 especially (1) 153:16 essentially (7) 49:19;78:11;114:22; 175:3;177:23;198:4;234:19 established (1) 186:23 estimate (6) 70:5,19;91:13;112:21; 113:2;217:22 estimated (1) 99:13 estimates (2) 99:4;221:4 estimating (2) 99:20;226:15 estimations (1) 99:12 estoppel (1) 19:23 et (17) 11:11,20;12:14;68:19; 69:11;70:16;96:23;129:16; 151:7;193:4,5,16;199:13,16; 219:22;226:24,24 Ethan (3) 92:22;137:23;203:5 evaluate (8) 83:4;108:1;118:10;153:6, 13;191:5;197:11;210:14 evaluated (5) 62:14;114:19;115:4; 144:25;189:14 evaluating (3) 108:11;153:15;183:11 evaluation (6) 63:1;117:2;130:6;184:19; 212:13;227:24 evaluations (1) 146:15 evaporation (2) 122:6;126:16 evapotranspiration (1) 122:4 even (9) 21:4;48:19;54:5;79:8; 87:8;121:13;132:1;157:20, 21 events (1) 19:20 everybody (9) 10:10;15:4;30:3,16;32:21; 35:13;177:10,14;216:13 everybody's (2) 31:5;32:23 everyone (8) 10:1,17;13:25;14:8,12; 28:10;232:17;236:5 evidence (23) 18:8;51:12,13;59:14,25; 109:20,21;148:13,17,19,21; 149:10,21,22;156:22;180:22,</p>
E			
<p>earlier (15) 17:24;32:2;97:19;132:23; 161:21;178:21;187:22; 188:13;189:23;192:5; 206:10;221:10;222:22; 231:24;233:12 early (6) 30:9;46:21;50:12;111:23; 188:6;217:25 ease (2) 49:17;59:6 easier (1) 215:3 east (2) 163:17,20 Eastern (11) 50:11,15;74:3;93:13; 107:15;117:2,4,14;128:6; 141:13;163:4 easy (3) 119:11;228:11,14 economic (20) 20:12;21:4,10,22;22:4,13, 17,17;23:3;231:4,12,14,25; 232:4,13;233:4,14;234:2,15, 21 economics (4) 22:1,5,11;23:2 edit (1) 67:5 edited (1) 43:25 editing (2) 159:2;174:6 edits (2) 159:4;223:18 education (1) 107:10 educational (2) 37:10;120:6 effect (2) 154:19;202:8 effective (2) 193:5;205:2 effectively (2) 47:22;202:15 effects (1) 211:19 efficiencies (1) 131:20 efficiency (19)</p>			

<p>23;186:4,5;200:3;230:23,24; 232:6 evident (2) 56:11;158:9 evidentiary (1) 173:15 exact (5) 129:6;162:21;164:21,24; 165:2 exactly (9) 75:13,17;77:23;96:3; 144:14;156:21;159:12; 183:16;226:15 Examination (19) 7:5;22:16,21;23:1;25:5; 34:20;35:4;37:5;39:9;49:17; 97:19;102:18;103:3;106:15; 119:6,23;124:13;149:23; 222:20 examine (8) 13:25;35:14,16;37:4; 106:10;110:5;119:22;219:17 examiner (2) 96:17,18 examining (4) 14:21,25;26:21;59:6 example (11) 85:17;92:4,4,7;93:11; 126:20;158:15;165:18; 222:1;226:11;227:19 exceeded (1) 24:3 excess (3) 127:20;168:8,15 exchange (1) 15:9 excluding (1) 233:4 excuse (4) 80:23;113:5;148:25; 195:17 excused (2) 31:8;119:13 exercise (3) 20:21;97:14;209:2 exert (1) 223:22 Exh (6) 7:10,12,15,17,20,22 EXHIBIT (153) 7:9;17:4;23:13;24:22; 25:13,18;29:7;39:25;40:1,2, 23;41:22;42:1,3,4,9,10,13; 43:17;44:14;48:24;49:1,1, 14,20,23;50:5,20;51:4,8,8, 11,13,15;52:1;54:9,23;55:2; 57:1,3,3,18;59:9;65:9,11,13; 66:12;67:6;72:5,6;73:1;76:1, 3;80:12,14;82:6,7;83:7;84:7, 8,14,19;97:1;101:19;102:2; 107:1,3,5,7,22;109:15,20,21; 110:18;112:3;113:11;116:7, 9;117:20;125:1,2,7;132:4,8;</p>	<p>133:4,8,16;134:25;135:1,9, 11;136:4,6,16;137:13,15,17; 139:18;145:11,12,14;146:3, 21,25;148:5,19;149:9,14,16, 19,21,22;150:6;157:18,19; 161:25;173:18;182:6,8; 184:15,17;185:9,10,14,18, 23;186:2,4,5,9,10,13;189:21; 190:4;191:13;196:5,17; 202:18,20;203:1;207:15,17; 213:14;214:25;215:3; 219:23,25;230:9,12,21,23, 24;231:10 exhibits (55) 14:23;16:19;23:22;24:7, 23,24;25:3,6,17,18,23;26:3, 4,5,7,8,10,11,15,17,22,24,25; 28:1,4,5,8,18,23;29:3,14,15; 39:15;40:15;41:17,18;42:8; 59:3,7,24;106:12;124:25; 135:5;148:17,18,21;179:4,6, 6;180:14,21,23;182:9; 229:13;236:6 exist (3) 19:17;46:14;81:4 existed (1) 19:15 existing (1) 102:5 exorbitant (1) 233:23 expect (6) 31:21;32:18;35:2;42:25; 78:14;184:3 expectation (1) 42:23 expected (3) 47:9;202:24;235:1 expecting (2) 41:18;229:15 experience (2) 19:1;144:25 experimenting (2) 226:1,5 expert (12) 13:15;35:22;36:9,11;76:6; 107:5,12;109:23;131:13,16; 232:19;233:1 expertise (2) 11:1;118:15 experts (6) 35:24;36:3,3,13,14;180:20 explain (19) 68:6;73:12;79:12;82:15; 88:9;90:8;153:19;155:18; 182:16;183:13;186:15; 187:2;188:11;192:21; 194:12;203:23;204:11; 209:23;211:13 explained (1) 195:1 explains (1) 209:5</p>	<p>explanation (3) 42:7;62:5;169:5 exploration (1) 22:19 exponentially (4) 21:5;72:19;207:10,13 extends (1) 19:14 extensive (1) 189:20 extent (6) 33:12;56:9;80:21;81:4; 197:7;199:18</p> <hr/> <p style="text-align: center;">F</p> <hr/> <p>face (1) 147:22 fact (13) 20:1;22:2,12;38:12;42:11; 112:14;145:22;146:11; 147:18;173:19;183:23; 196:22;232:18 factor (3) 56:14;197:2;214:22 factors (9) 151:9,11,16,22,24,25; 152:3,5;189:1 facts (12) 18:19;19:14,17;21:24; 22:2,11;231:22,23;232:3,5, 23,25 factual (1) 22:9 failed (1) 185:23 Fair (16) 34:25;50:3;51:20;100:5; 103:24;111:16;115:13,15,17, 20;137:7;143:24;169:3; 201:7;205:17;235:12 fairly (2) 14:14,14 fall (6) 107:19;159:21;170:2,14, 20;183:17 Falls (98) 11:13,23;19:8;42:19;43:1, 6,13;54:25;55:10,23;56:16; 57:14;58:12;60:24;61:7; 62:7,15,22;73:16;88:6; 89:18;92:7;99:14;100:8,11, 13;122:13;128:4,13,17,23; 132:9,10,15,24;136:17; 137:10;140:9;141:4,15; 143:15;144:2,6,12,17,20; 145:1,2,5,8,10,15,18,24; 146:13,16;147:14,17; 161:19;162:22;164:3,6; 165:12,16,19;168:22; 171:19;178:13,20;181:9,11, 17,21;183:12;186:19; 187:19,24;189:7,10,15;</p>	<p>190:21;191:10;192:11; 193:19,20;194:2,6;201:6,10; 222:2,8,23;223:3,7;224:5,10, 12;225:2 Falls' (1) 184:9 familiar (45) 10:19;38:5;76:9;77:5; 78:8;80:20;81:1,3;82:12; 83:11;94:11;118:1,3,5; 121:8;145:22;146:11,14; 157:24;158:2;163:3,6,7,12, 22;164:9,13;167:9;173:23; 174:11;179:22;186:12; 190:22,24;192:9;196:23; 204:23;207:20;208:16,17, 22;209:19;211:9;212:3; 226:18 far (3) 86:24;94:19;217:10 farmsteads (1) 195:1 farther (2) 105:24;127:2 fault (1) 139:11 February (4) 133:24;170:10,11;206:7 feel (1) 143:18 felt (2) 157:5,11 FERGUSON (11) 12:23,23;66:3;67:1; 130:16;137:23;173:21; 177:4;184:22;185:4;203:5 few (14) 17:20;71:1;72:3;92:3; 96:5;103:15;116:6;153:16; 167:12;170:8;205:17; 206:13;211:17;220:13 field (6) 68:24;127:4,6,11;194:21, 21 fields (1) 194:25 Fifth (70) 7:10;10:14;16:21;18:4; 20:3;21:1;22:1,10,18,23; 38:4,7;41:4,23;43:16;44:14; 63:19;64:3;66:24;67:14,18, 23,24;75:7,9,20;78:9,21; 79:17,24;80:10;81:17,23; 82:22;95:14;98:20;107:6,23; 109:1;113:9;121:6;123:8; 124:24;132:11;136:25; 144:1;150:14,16;158:10; 159:17;162:1;169:11;173:1, 5,8,13,16;174:1,24;180:12; 196:18;206:3,17;207:11; 209:10;211:21;212:10; 213:14;218:8;231:9 figure (11)</p>
--	--	--	--

76:15,16;83:23;85:10;
194:3,5,5;205:8,8,14;228:3
figures (6)
75:1;78:15;85:14;178:20;
179:1;228:9
figuring (1)
31:3
file (3)
17:15;94:2;123:13
filed (4)
16:17;24:3;147:13;148:5
files (4)
94:3;123:14,18;146:6
filing (1)
148:4
fill (2)
214:19,19
filling (2)
169:1,1
Final (16)
7:11,12,17;17:2;41:23;
42:5;57:5;65:25;66:17;
95:16;116:13;135:12;
136:13;140:22;176:24;
204:15
finalized (3)
46:15,16,20
financial (1)
234:22
find (7)
30:8;133:6;136:16,19;
138:3;156:17;189:12
finding (5)
196:21;231:20,23;232:4,6
findings (2)
38:12;42:11
fine (4)
116:5;152:3;230:5;236:2
finish (7)
29:25;30:4,10,10,15,17,17
finished (2)
226:11;228:23
firm (2)
106:25;118:14
first (39)
10:16;21:23;26:18;27:25;
28:15;35:13;36:25;38:21;
39:11;40:7;44:2;45:24;
46:14;54:1;55:9;95:13;
106:7;110:22;113:13;116:8;
119:19;120:19;126:7,20;
138:4,5,10;145:20;155:19;
158:9,19,21;171:20;187:16;
188:7,20;204:2;225:1;
232:11
fit (1)
75:18
five (3)
178:17;198:4,7
five-eighths (2)
145:23;147:16
Fletcher (41)
11:12,12;24:15,16;32:6,7,

12;33;22;34:6,11,24;35:1;
36:6,7,8;59:11;84:11;87:19;
102:12,14;135:17,21;136:1;
139:19;148:25;149:4,12;
150:8,14,18;159:23;190:6,8;
206:8;222:15;229:18;
230:14,19;233:8,9;236:2
flexibility (2)
31:18;32:19
flip (8)
42:3;74:21;83:13;117:21;
126:3;186:10;203:12;215:3
flipped (1)
30:23
flooding (2)
167:23;168:4
flow (33)
42:11;43:9;57:10;61:17,
18;73:17;90:4;92:5;94:8,13;
98:25;100:12,16;110:21;
127:7,21;128:6,13,17;145:8;
162:25;165:6;167:10,11;
181:12,13,22,23;183:12;
190:13;213:23;224:10,12
flows (41)
51:2;60:23;61:1,7,20;62:2,
6,15,23;89:17,18;91:8;
92:11;99:10,13,18;100:7,8,
13,14,15,18,19;112:22;
113:3;127:14,17;128:4,5,19,
22;144:3,7,10,11,17,21;
145:1,2,2;165:18
focus (2)
23:3;92:9
focused (1)
118:13
focusing (1)
140:9
folks (5)
13:14;14:1;16:4;31:10;
177:11
follow (7)
17:21;28:3;33:18;35:3;
166:25;167:2;177:5
followed (2)
102:19;174:13
following (4)
19:13;38:20;218:20;230:7
follows (3)
37:1;106:8;119:20
follow-up (7)
71:1;88:6;93:6;94:4;
96:24;167:12;205:18
Food (2)
20:13,15
Foods (3)
26:7,12;39:24
footnote (5)
83:14,14;100:25;214:4,10
force (2)
115:1,8
forced (2)
115:11;172:4

Forecast (44)
7:13,18;40:25;42:6;53:7;
57:5,8;94:5,11;114:11;
122:1;161:22;162:10,14,15,
17;165:6,10;166:2,12;167:3,
4,4,7,13;168:11,11;170:23;
171:5,9,17;177:6;181:7,10,
21;183:12;184:1,9,12,22;
188:8;190:21;191:10;225:4
forecasted (2)
52:2;94:7
Forecasting (3)
190:13;214:13,14
forecasts (2)
51:24;113:13
forever (1)
18:20
forge (1)
60:9
forgot (2)
35:20;136:9
Fork (2)
78:23;79:20
form (1)
168:18
formal (3)
170:13;232:15,20
format (1)
54:11
formerly (1)
166:10
formula (1)
225:3
formulate (1)
108:2
forward (7)
14:22;35:14;36:22;74:21;
106:5;119:17;230:5
foundation (6)
103:10,12;129:2;148:14,
23;153:10
foundational (1)
146:8
four (4)
25:5;26:24;29:25;120:25
Fourth (29)
64:7,10,18;65:25;66:17;
71:6;83:20;116:13,17;
135:12;136:12,16,18;137:5,
8;140:24;142:5;169:9,11;
171:1,24;172:5,10;175:2;
182:2;191:14;197:10;
206:16;207:12
fraction (5)
69:23,25;70:5,6;199:5
frame (1)
217:17
framework (1)
60:22
frequent (4)
206:18;207:2,3;227:23
Friday (8)
29:25;30:4,11,18;31:17,

18,21;32:16
front (19)
10:20;14:23;15:18;29:13;
39:19;41:21;49:14;72:5,9;
74:10;80:17;84:13;107:3;
117:21;134:24;150:7;
161:25;189:22;190:18
frustrate (1)
22:14
full (3)
231:12,14;235:15
full-blown (1)
156:15
fully (1)
101:4
function (1)
151:8
furniture (1)
10:8
further (36)
39:5;58:24;60:1,3;63:7;
79:9;80:5;87:15;95:4,6;
96:12,15;102:25;105:8,13;
115:21,23;119:4,6;124:11;
149:23;161:9,13;166:14,18;
205:16;212:22;216:7,8;
219:10,12;224:18,19;227:9;
228:19,22
futile (12)
81:20;208:19,20,22;
209:20;210:2,5,11,15,22;
211:6,10
future (1)
79:1
FYI (1)
30:25

G

gage (14)
61:16;89:24;90:1;94:13;
144:11;145:2,2,7;162:12,18,
24;163:16;171:7;188:16
gaging (1)
89:22
gain (12)
61:2,15,24;62:20;79:22;
85:22;89:21;90:21;99:25;
100:5;108:12,22
gains (17)
61:5,6,10;75:6;77:1,6;
78:12;87:12;90:2;91:1;92:7,
15,21;98:8;114:1,8,20
gallery (1)
229:2
Garrick (5)
84:1,14,20;87:4;172:20
Gary (3)
11:4;45:23;95:16
gave (13)
54:5,8,12,20;67:7;72:4;
100:4;123:19;130:25;141:9;
155:23;185:4,7

<p>gears (5) 53:10;68:1;181:6;196:17; 224:4</p> <p>Geisler (3) 92:22;137:23;203:5</p> <p>general (8) 19:19;34:14;77:12;78:16, 18;89:14;108:3;147:3</p> <p>Generally (17) 19:13;74:1;78:8;80:4,19; 90:8;107:9,21;137:3;162:18, 22;187:7,15;204:24,25; 207:22;215:16</p> <p>generate (1) 85:5</p> <p>generated (2) 176:18;195:25</p> <p>genuine (1) 168:12</p> <p>geographic (2) 69:14;212:8</p> <p>geography (1) 163:19</p> <p>geologist (2) 37:16;120:10</p> <p>geology (3) 37:12;120:7,8</p> <p>gets (3) 130:2,2;217:5</p> <p>GIS (6) 68:10;88:12,20;121:4; 140:3;194:9</p> <p>given (11) 58:17;65:7;67:17;112:20; 113:25;158:24;159:12; 203:10;209:15;231:2;232:18</p> <p>gives (2) 151:21;232:7</p> <p>giving (2) 51:17;99:23</p> <p>glitch (1) 15:22</p> <p>goal (1) 30:17</p> <p>goes (10) 108:7;127:24;133:9; 140:13;150:21;167:4; 193:13,14,14,15</p> <p>Good (16) 12:13;24:1;27:7;39:23; 41:20;50:7;60:15;96:22; 110:9,12;116:3;124:20; 141:9;150:5;219:21;227:16</p> <p>grab (1) 39:25</p> <p>graph (12) 50:20;52:10;55:1,6,9,22; 73:6,7;97:18,21,23;113:18</p> <p>graphs (1) 131:9</p> <p>great (10) 30:16;31:1;41:19;110:11; 166:24;201:6;213:21;214:4,</p>	<p>25;216:15</p> <p>greater (2) 108:8;198:7</p> <p>Greg (6) 12:1;30:23;32:8,10;131:2; 179:12</p> <p>grievous (1) 111:6</p> <p>Ground (133) 11:25;12:5,7,10,12,18; 13:2;16:7,11,12;17:14;18:8; 20:12;33:24;34:15,21;36:14; 39:8;42:11;49:4;57:10; 58:17,21,22;63:13,15;68:24; 69:23,25;70:2,6,11,18,23; 73:18,19,23;74:2,6;75:3,6,7, 16,22;77:7,21;78:2,4,11,17; 79:19,20,20,21,24;80:1,3,16; 81:8,12;83:19,21;84:3,25; 85:11,17;86:18,21;89:17; 91:2,13;93:7,12,13,14,20,23; 95:7;96:15;99:5,13;101:8, 11,15;102:3;106:24;107:25; 108:12,23;109:4,12;110:13; 118:13;124:14;157:7; 159:16;196:23;197:2,11,14, 17,19,20;198:7,11,12,16,22; 199:15,17,19;201:1,19,21, 23;202:1,4,7,12,14;205:3,11; 207:3;208:12;212:22; 219:13;221:4;223:1,14; 224:20;226:25;228:20; 231:18</p> <p>group (65) 44:19;49:12;53:13,17,21, 24;54:2,16,21;63:21,25; 67:8;72:4,18;95:3,19,20; 105:3;107:19;117:17; 122:16;130:19;131:9,14,17; 133:24;144:13;145:5;149:7; 157:25;170:18;174:13,17; 175:18,22,24;176:5;177:9, 13,25;178:22;179:11;180:3, 8;182:19;185:4;196:3; 203:10;212:22;215:2;217:7, 8,24;218:3,7,12,15,20,23,25; 219:1,13;224:20;228:20; 230:16</p> <p>groups (4) 117:6;216:20;217:2,5</p> <p>growing (1) 160:20</p> <p>grown (1) 154:8</p> <p>guess (24) 16:19;17:7,15;22:7;30:16; 44:20;51:7;70:8;105:16; 114:24;115:6,15;122:24; 133:10,10;144:23;146:3; 155:3;166:8;193:16;210:20, 21;229:6;235:3</p> <p>guessing (1) 25:7</p>	<p>guidance (1) 217:8</p> <p>Gustavus (1) 120:7</p> <p>Guys-ler (1) 92:22</p> <hr/> <p style="text-align: center;">H</p> <hr/> <p>Hahn (1) 11:23</p> <p>half (2) 186:17;196:9</p> <p>half-month (4) 46:25;47:4,18;48:21</p> <p>halfway (3) 117:23;175:23;213:2</p> <p>hand (10) 16:5;27:20;32:5;63:8; 88:23;134:23,24;141:11; 142:20;143:16</p> <p>handed (2) 39:14;145:14</p> <p>hands (1) 219:13</p> <p>happen (3) 86:11;114:10;214:21</p> <p>happened (2) 44:21;147:17</p> <p>happening (2) 32:21;109:2</p> <p>happens (2) 126:16;224:17</p> <p>happy (1) 147:24</p> <p>hard (3) 113:18;122:3;228:3</p> <p>hardened (7) 132:16,19;143:6;194:16, 21,24;195:3</p> <p>harm (2) 233:14,22</p> <p>Harris (17) 11:22,22;19:6,7,8;27:13; 88:2,4,5,23;95:4;161:15,17, 18;166:14,17;167:1</p> <p>harvesting (2) 152:24;154:16</p> <p>hate (1) 173:7</p> <p>head (2) 90:18;210:16</p> <p>headgates (1) 161:2</p> <p>heading (4) 117:23;190:13,17;191:19</p> <p>headphones (1) 216:13</p> <p>heads (1) 235:20</p> <p>hear (8) 14:14,15;15:4,8;33:18; 88:15;105:24;216:13</p>	<p>heard (7) 128:12,15;147:8;174:22; 200:7;212:5;215:13</p> <p>HEARING (202) 10:1,11,14,24;11:8;12:19; 13:3,8,12,19,24;14:2,3,11, 18;15:18,23;16:21,23;17:1,8, 12,17,25;19:5;20:6,8;21:17; 22:8;23:5,9;24:13;25:3;26:1, 14;27:1,11,15,19,23;28:6,15, 20,24;29:1,6,12,23,25;30:5, 14,20;31:1,23;32:13,18;33:3, 3,6,7,10;34:4,9,25;35:2,12, 25;36:7,17,20;37:2,39;7,12, 18;40:5,11,14;41:11,14; 51:10,11,16;56:19;59:1,8,12, 12,16,19,22;60:1,4,12;63:7; 65:12;66:7;77:24;87:16,22, 25;88:17;95:6;96:14;97:12; 102:10,16,22,24;103:2,11; 104:4,17;105:5,13,21;106:9; 107:6;109:17,19,25;110:4; 115:23;119:6,10,14,21; 124:2,6,13,17;125:20,22,23; 129:4;146:7,23;147:9;148:2, 8,22;149:3,5,15,18,20,23; 150:11;155:7;159:25; 161:11,13;166:17;168:20; 172:21,25;173:5,8,11,13,15; 180:16;185:16,17,20,25; 186:3;196:6,11,14;206:11; 210:25;212:21;213:1,4,8; 216:8,11,14;219:12;222:16; 224:19;228:19;229:1,8,15, 19,23;230:4,11,17,20;231:8; 232:2,5;233:5,20;234:6; 235:10,19;236:1,3,7</p> <p>hearings (2) 11:1;16:20</p> <p>Heidi (1) 179:12</p> <p>Heise (11) 94:8,13;162:12,18;163:16, 20;165:6;167:11;181:12,22; 189:5</p> <p>held (5) 117:17;173:15;182:18; 193:17;214:5</p> <p>hello (4) 15:21;37:7;119:25;120:1</p> <p>help (8) 11:3;89:23;106:1;118:10, 18;151:10;187:5;236:4</p> <p>helpful (4) 24:16;51:17;59:7;169:5</p> <p>Henry's (2) 78:23;79:20</p> <p>Here's (2) 176:7,8</p> <p>Hi (2) 213:11;222:22</p> <p>Higgs (2) 36:12;76:8</p>
--	---	--	--

<p>high (5) 122:4;164:20,24;165:2; 167:21</p> <p>higher (5) 187:9,10,14;193:21;194:3</p> <p>highest (1) 168:2</p> <p>highlight (1) 87:10</p> <p>highly (2) 142:22,23</p> <p>Hill (3) 61:2,18;89:21</p> <p>history (1) 107:10</p> <p>hold (4) 30:8,15;172:25;173:5</p> <p>Holden (1) 11:22</p> <p>holder (1) 20:25</p> <p>holders (1) 234:16</p> <p>holding (2) 172:21;173:13</p> <p>home (1) 167:23</p> <p>honestly (1) 31:2</p> <p>Honor (1) 102:23</p> <p>honored (1) 210:3</p> <p>hopefully (3) 15:3;134:24;141:9</p> <p>hour (2) 105:16;196:9</p> <p>hour-and-a-half (1) 60:6</p> <p>housekeeping (2) 149:9;235:9</p> <p>houses (1) 69:5</p> <p>hydrogeologist (1) 106:25</p> <p>Hydrologic (3) 107:15;117:4,14</p> <p>hydrologist (1) 166:10</p> <p>hydrology (4) 37:25;108:11;117:3;121:4</p> <p>hypothetical (1) 90:24</p> <p>hypothetically (1) 232:24</p>	<p>163:5;168:2;198:7;210:6</p> <p>IDAPA (1) 80:15</p> <p>idea (2) 135:2;199:6</p> <p>ideal (2) 142:25;143:3</p> <p>ideas (1) 189:3</p> <p>identified (14) 16:24;25:2;26:4;28:8,9; 29:3;98:19;99:3;102:4; 107:22;121:20;136:18,20; 215:19</p> <p>identifies (5) 68:23;82:18,18;83:15; 183:9</p> <p>identify (16) 18:12;24:6;40:2;41:22; 42:3;49:1;51:18;57:3;69:14; 133:17;135:10;137:17; 151:16;156:20;219:25;221:1</p> <p>identifying (2) 25:21;36:1</p> <p>IDWR (17) 7:15,20;12:25;76:11;88:8, 12;89:9;107:13;114:23; 138:11;140:4;141:6,11,22; 166:11;200:25;220:22</p> <p>IDWR's (2) 68:10;88:20</p> <p>IGWA (25) 7:22;12:16,18;13:18; 17:14;24:3,20;25:17;28:4,9; 42:15;76:4;83:16,19;85:2; 101:12,14;117:4;134:25; 135:6;166:23;205:11,20; 206:5;217:19</p> <p>IGWA's (8) 40:8;41:2;76:18;84:2; 85:9;86:25;100:25;182:8</p> <p>images (2) 68:19,20</p> <p>immediate (1) 79:7</p> <p>impact (13) 21:4;22:4;43:20;76:25; 79:8;86:9;103:20;112:10,22; 113:3;114:1;144:10;176:8</p> <p>impacts (17) 20:12;21:22;22:17;44:4; 51:1;75:22,24;78:16;79:3,8; 82:19;97:22;101:7,17; 108:12;112:17;114:20</p> <p>impetus (4) 44:24;45:2,10;170:25</p> <p>impetuses (1) 171:24</p> <p>implement (3) 218:19;219:2;223:14</p> <p>implemented (6) 45:16;46:9;108:2;218:8, 11;226:8</p>	<p>important (1) 205:12</p> <p>impose (1) 27:19</p> <p>impractical (1) 155:10</p> <p>impression (1) 89:14</p> <p>improve (3) 214:13,14,15</p> <p>improved (1) 218:21</p> <p>improvement (1) 183:24</p> <p>inaccurate (2) 143:15;225:13</p> <p>inadmissible (1) 21:12</p> <p>inappropriate (2) 108:16,19</p> <p>Inc (1) 20:13</p> <p>inch (1) 145:23</p> <p>incised (1) 99:19</p> <p>include (7) 62:22;79:4;100:9;203:22; 204:2;222:10,11</p> <p>included (3) 73:21;93:23;122:23</p> <p>includes (2) 62:24;70:9</p> <p>including (1) 10:11</p> <p>incomplete (1) 30:5</p> <p>inconsistency (1) 142:18</p> <p>incorporate (1) 142:7</p> <p>incorporated (2) 143:6;219:7</p> <p>incorporation (1) 128:13</p> <p>increase (6) 110:20;114:8;122:13; 151:23;206:21,24</p> <p>increased (2) 21:4;151:8</p> <p>independent (1) 102:13</p> <p>independently (1) 77:11</p> <p>indicate (3) 85:20;183:24;226:25</p> <p>indicated (1) 20:1</p> <p>indicates (2) 156:8;160:13</p> <p>indicating (1) 224:14</p> <p>indicator (1)</p>	<p>172:1</p> <p>Indirectly (3) 60:25;121:3;169:21</p> <p>individual (4) 83:21;199:5;221:5,7</p> <p>individually (1) 170:12</p> <p>ineffective (1) 108:19</p> <p>infiltrate (1) 127:9</p> <p>infiltration (1) 126:25</p> <p>inflow (9) 61:16,21;91:4;162:11,23; 167:16;168:8,15,15</p> <p>inflows (4) 91:11;92:17;99:7;167:5</p> <p>inform (1) 78:22</p> <p>informal (3) 231:6;232:16,21</p> <p>informally (1) 233:2</p> <p>information (31) 16:15;21:11,14;34:12; 38:11;42:16;44:15,17,18; 54:18;55:5;64:4;79:16,25; 80:2,9;89:23,24;90:1;91:17; 94:7,16;95:17;104:22,25; 146:17;157:3;180:2;197:5; 218:14,22</p> <p>inherent (2) 63:4;232:12</p> <p>initial (2) 24:3,5</p> <p>initially (1) 70:11</p> <p>initiated (1) 33:4</p> <p>initiation (1) 64:6</p> <p>Injury (7) 41:24;66:1,18;98:20; 116:14;135:13;184:20</p> <p>input (4) 89:4;90:12;131:3;177:24</p> <p>inputs (1) 60:23</p> <p>inquiry (1) 146:3</p> <p>In-Season (17) 41:25;47:8;66:2,18; 108:17,18;111:3;116:15; 133:21;134:10;135:14; 137:21;155:10;184:20; 192:23;193:12;203:4</p> <p>insert (2) 56:20;97:24</p> <p>inserted (2) 42:15;176:6</p> <p>inside (1) 199:21</p>
I			
<p>Idaho (24) 11:4,23,25;12:9,12,21,23; 17:14;19:8,12;37:16,18; 63:13;65:24;88:6;120:11,13; 145:15;161:19;162:22;</p>			

<p>inspected (1) 123:19</p> <p>instead (4) 115:8;142:8;147:16;205:8</p> <p>instruct (1) 56:22</p> <p>instructed (2) 83:3;217:10</p> <p>instruction (2) 14:3;83:5</p> <p>instructions (3) 13:22;65:7;209:15</p> <p>insufficient (1) 197:6</p> <p>intend (2) 20:11;30:3</p> <p>intent (2) 29:9,24</p> <p>interaction (1) 90:19</p> <p>interest (7) 20:20;82:20;103:20; 231:12,14;232:9;233:25</p> <p>interesting (1) 144:22</p> <p>internalized (1) 122:4</p> <p>internally (3) 131:18;160:10;176:19</p> <p>Interruption (1) 27:10</p> <p>intimate (1) 10:7</p> <p>into (50) 20:14;27:9;34:13;50:8; 51:8,12,13;59:13,24;83:1; 98:19;108:8;109:16,20,21; 142:7;144:2;147:17,21; 148:13,17,19,21;149:10,21, 22;165:19;167:4,5,13;168:7; 170:4,20;176:12;180:22,23; 186:4,5;202:7,14;207:2; 214:22;219:7;228:3,15; 230:23,24;232:5;233:25; 234:22</p> <p>introduce (4) 10:17,20;20:11;28:7</p> <p>introduced (2) 20:15;34:12</p> <p>introductory (1) 183:8</p> <p>investigate (1) 205:15</p> <p>investigations (1) 144:2</p> <p>invitation (1) 217:20</p> <p>invited (8) 53:20,23;54:2,4;177:12; 217:5,9,11</p> <p>involved (8) 60:20;115:5;117:5;206:6; 210:4;212:16;216:19;217:1</p>	<p>involves (1) 61:5</p> <p>irrelevant (2) 21:13;210:23</p> <p>irrigate (2) 201:24;202:13</p> <p>irrigated (106) 68:3,8,11,24,24,25;69:2,3, 15;70:1,16,23;88:9,19,22,24; 89:1;118:5,10,22;122:2; 132:20;133:22;134:3;138:2; 139:6,16;140:4,13,17,20,21; 141:6,14,17,22;142:1,6,11, 16,17,21;143:1,9;154:25; 155:17,20;156:5,10,12,18, 19;157:14;177:24;178:1,23; 191:21,24;192:1,3,5,6,12,20, 22;193:13,14,18;194:1,19, 24;195:3,5,8,11,21,22;196:4; 199:16;202:9;204:1;216:4; 220:14;221:2,11,12,15,15, 18,19,20;222:4,7,9,23;223:7, 10,11,16;225:20,22;226:22; 227:1,24,25;228:9</p> <p>Irrigation (33) 11:11,13;12:14;43:5; 45:19;56:14,17;57:12;62:9; 69:12;70:15;78:13;86:15; 93:11;94:2;96:23;98:22; 99:5,13;129:25;160:19,21; 191:19;197:7;198:3,4,6,7; 203:19;204:6;221:8;223:3, 19</p> <p>irrigators (1) 221:5</p> <p>issuance (4) 10:14;15:19;67:17;95:23</p> <p>issue (18) 14:19;15:24;16:3,4;17:24; 18:2;25:14,16;27:22;31:9; 36:8;67:19;122:22;183:11; 231:22;233:10,14,17</p> <p>issued (22) 19:25;22:3;38:17;71:7,10; 75:8,21;78:10;79:17;80:10; 83:21;116:19;142:5;153:23; 170:17;171:6;173:16;175:4; 184:11;188:15,24;234:13</p> <p>issues (22) 16:23;17:10,16;18:12; 20:4;21:21;23:3,4,7;34:3,8; 64:3;67:20;104:23;107:25; 181:3;183:9;223:24;231:25; 232:4;233:11,12</p> <p>issuing (2) 173:1,5</p> <p>item (5) 98:23;126:19;127:12; 149:9;183:23</p> <p>IWRRI (1) 70:12</p>	<p style="text-align: center;">J</p> <p>JACKSON (2) 13:1,1</p> <p>January (5) 144:20;145:16;158:22; 159:1;179:11</p> <p>Jaxon (4) 36:11,12;76:8;77:9</p> <p>Jaxon's (2) 77:25;78:15</p> <p>Jay (2) 229:2,2</p> <p>Jennifer (37) 12:21;26:21;27:9;31:8; 36:22,24;37:9;39:23;41:20; 45:7;49:1,14;51:14;58:25; 60:15;63:15;65:15;66:10; 67:7;72:9;76:3;80:14;84:13; 87:14;95:13;97:3;103:5,14; 141:8;158:25;159:7;169:17, 22;174:22;194:20;195:1; 200:8</p> <p>J-e-n-n-i-f-e-r (1) 37:9</p> <p>Jerry (2) 12:17;14:15</p> <p>John (2) 12:13;96:22</p> <p>JOHNS (2) 12:4,4</p> <p>join (1) 21:15</p> <p>joint (5) 162:16,17;165:10;167:3; 168:11</p> <p>Judge (6) 17:3;143:20,23;157:13; 232:20,21</p> <p>judgment (4) 19:15,18,20,22</p> <p>judicata (6) 17:23;18:3,10,15;19:14,16</p> <p>judicial (2) 17:3;148:7</p> <p>July (7) 137:5;184:21;206:23,24; 207:5,6;227:11</p> <p>June (1) 30:2</p> <p>junior (20) 18:8;42:23;52:11,23;53:6; 58:9,21;73:2;78:4;85:21; 93:20;108:23;113:14,23; 114:3,10;205:3,11;207:3; 234:16</p> <p>junior-priority (1) 234:16</p> <p>jury (1) 31:8</p> <p>justify (2) 193:21;194:2</p>	<p>Justin (1) 32:15</p> <p style="text-align: center;">K</p> <p>Kara (16) 12:23;66:3;67:1;130:15; 137:23;158:25;169:22; 170:11;173:20;174:3;177:3, 4,21;184:22;189:18;203:5</p> <p>Katie (8) 27:13,13,15,17,20;31:24; 32:1,2</p> <p>keep (9) 25:8,22,25;30:12;32:21, 21,22;135:23;189:17</p> <p>keeping (1) 131:20</p> <p>keeps (1) 197:17</p> <p>Kent (3) 11:12;14:14;136:8</p> <p>kept (1) 180:10</p> <p>Kidwell (1) 11:22</p> <p>Kimberly (4) 61:1,17,18;89:21</p> <p>kind (23) 14:16;31:14;76:23; 118:12;126:17;131:5,21; 146:17;150:21;154:20,21; 160:7;170:13;175:9;177:5; 182:21;194:21;197:21; 201:5;218:13,22;231:19; 235:15</p> <p>kinds (1) 147:12</p> <p>King (5) 31:16,18;61:2,18;89:21</p> <p>Klahn (56) 11:17,17;28:14;30:19,21, 21;32:10;40:21;60:10,12,14, 16;63:5;98:24;99:4;102:22, 23;124:15,16,19,20;129:3,9; 133:5,14;135:2,6,8,10,19,23; 136:3,8,10;137:14;139:20, 23;145:11,13;146:9,10,20, 25;147:8,10;148:4,9,20,23, 24;149:2,12,17;155:9,22; 235:25</p> <p>knew (11) 44:3,8;95:21,25;96:9; 122:7;129:5;164:20,24; 165:2;167:21</p> <p>knowledge (8) 54:4;64:5;70:13;79:16; 80:8;89:8;126:1;212:12</p> <p>known (1) 91:3</p> <p>knows (1) 148:12</p>
--	--	---	---

L	<p>95:13 least (29) 10:6;13:15;14:5;16:2; 22:25;23:3;26:8,15;29:19; 30:10;33:4,9;44:22;50:16; 78:24;105:6;112:1;143:5; 146:8;157:13;199:11,18; 216:20;222:1;226:16; 231:17;234:7,12,18</p> <p>lectern (2) 14:25;35:15</p> <p>left (5) 93:24,25;196:1;222:6,7</p> <p>legal (7) 19:21,21;81:18;104:23; 200:1,4;218:1</p> <p>less (6) 31:21;86:22;97:21;192:14, 15;225:9</p> <p>letter (2) 178:15,16</p> <p>level (3) 130:12;131:23;199:11</p> <p>licensed (2) 37:15;120:10</p> <p>lies (1) 20:20</p> <p>likely (5) 78:24;156:21;202:1; 206:24,25</p> <p>limine (1) 234:11</p> <p>limit (3) 16:6;17:11;234:11</p> <p>limited (2) 16:23;22:9</p> <p>limiting (2) 21:10;104:20</p> <p>line (10) 17:21;52:16,18;56:20; 73:6,7;78:2;84:15;121:23; 206:9</p> <p>lines (1) 225:25</p> <p>list (24) 15:12;16:18;21:20;23:4; 25:2,18;26:3;28:11,11,18; 29:10;30:2,6,22;32:15;36:9; 92:17;119:15;121:23;140:7; 151:21;161:20;177:14; 229:21</p> <p>listed (6) 126:8,19;127:4,12;183:18; 215:23</p> <p>listening (3) 13:13,21;14:1</p> <p>lists (3) 203:14;204:13,15</p> <p>litigants (1) 19:22</p> <p>litigated (2) 18:2,6</p> <p>little (22)</p>	<p>10:3,7;23:14;25:9;31:18; 50:9;60:19;69:7;78:24; 153:10;154:21;157:2,16; 163:6;170:12;208:17;224:4; 225:18;229:20;230:2;231:1, 19</p> <p>living (1) 18:21</p> <p>Liz (5) 166:8,10;182:10,22; 188:14</p> <p>located (4) 61:7;162:18,20;163:11</p> <p>location (1) 10:5</p> <p>locations (4) 10:10;62:25;75:25;80:5</p> <p>locked (1) 18:20</p> <p>lodge (1) 210:20</p> <p>log (1) 132:5</p> <p>logical (1) 230:6</p> <p>long (7) 25:21;32:16;37:21;38:2; 96:3;120:16,24</p> <p>longer (4) 50:16;127:1;156:18;196:7</p> <p>long-term (8) 55:20;62:14;79:2,3;86:8; 101:7,17;211:19</p> <p>look (67) 13:6;15:12;18:22,24; 20:23,23;21:20,24;25:10; 39:25;43:17,25;48:25;49:22; 50:1,19;51:15,25;52:8,10,16; 55:1,9,22;57:3,18;62:11,18; 68:21;78:1;83:1;92:1,11; 97:4,17;107:25;123:17; 131:7,19;133:5;136:15,21; 137:15;140:10;145:19; 148:3;154:11;156:9,14; 158:6;160:14,17;165:5; 169:20;176:2;181:17,18; 183:8,19;185:7;191:18; 196:21;213:17,22,24; 229:13;235:4</p> <p>looked (4) 101:20;134:14,18;188:9</p> <p>looking (38) 16:18;20:2;23:3;41:8; 52:17;58:4;62:18;86:1,2; 112:3,8;113:11,12;116:12; 125:1;130:18;131:4,9; 133:13;134:25;141:16; 162:11;165:22;170:22,23, 23;176:13;184:23;188:4,8, 10,11;189:19;203:7;208:18; 214:7,15;229:20</p> <p>looks (7) 16:25;94:8,12;133:19;</p>	<p>137:19;153:1;162:10</p> <p>loss (3) 126:8,11;161:1</p> <p>losses (6) 126:14,17,20;127:13,16,25</p> <p>Lost (2) 210:8,14</p> <p>lot (10) 17:18;24:2;38:8;223:20, 23;225:21,24;227:17; 228:10;233:12</p> <p>loudly (2) 12:20;15:6</p> <p>Lower (5) 92:7;100:11,12;132:24; 168:4</p> <p>LRE (2) 12:15;106:22</p> <p>lump (1) 69:7</p> <p>lunch (3) 105:16,17,20</p> <p>Lynker (6) 13:17;179:10,20;180:4; 189:24;190:18</p>
		M	
		<p>M&M (2) 10:22;11:2</p> <p>Macheel (1) 144:15</p> <p>Madison (2) 78:23;79:21</p> <p>magnitude (5) 72:23;82:1,4,8;111:2</p> <p>mailed (1) 177:10</p> <p>main (1) 170:25</p> <p>makes (6) 47:17;89:12;95:1;209:25; 210:1;215:25</p> <p>making (4) 50:4;231:24;232:3,6</p> <p>Malad (1) 92:4</p> <p>management (6) 14:4;80:15,20;207:17,21; 209:7</p> <p>manager (1) 144:6</p> <p>manifested (1) 154:6</p> <p>manipulation (1) 62:8</p> <p>Many (15) 10:4,19;14:5;21:21;43:19; 50:3;56:3;57:19,25;111:10; 114:21;162:21;201:18,22; 216:1</p> <p>map (1) 164:17</p>	

<p>mapping (1) 122:3</p> <p>maps (4) 88:24;142:21;164:10,15</p> <p>March (1) 181:23</p> <p>mark (1) 145:11</p> <p>MARKED (36) 7:9;40:1;42:1;48:24; 51:11;57:1;59:9;65:9;76:1; 80:12;84:7;107:1,3;109:19; 116:7;133:4;135:1;136:2; 137:13;145:12;148:17,19; 149:20;157:18;179:4; 180:21;182:6;184:15; 185:17;186:2,3;202:18; 207:15;219:23;230:21,22</p> <p>Marten (2) 11:10;12:14</p> <p>master's (2) 37:13;120:8</p> <p>Mat (3) 15:20,24;94:21</p> <p>match (3) 87:11;90:14,17</p> <p>Material (6) 41:24;66:1,18;116:14; 135:13;184:20</p> <p>materials (1) 14:24</p> <p>math (1) 143:11</p> <p>mathematical (1) 129:25</p> <p>MATT (43) 7:2;12:25;53:18;54:20; 64:19,20,21,25;65:7;66:3; 67:1;73:14;78:22;81:16,22; 82:25;119:15,17,18;120:4; 133:24;137:23;149:6;150:4; 166:23,25;180:24;186:7; 190:14;191:13;196:16; 202:20;203:6,7;206:12,15; 212:19;213:12;216:18; 222:22;224:24;228:17,24</p> <p>M-a-t-t (1) 120:5</p> <p>matter (10) 10:16;14:6;16:20;19:10; 34:8;35:20;151:14;225:6; 229:25;233:14</p> <p>matters (5) 15:16;32:25;35:9,10;36:15</p> <p>MATTHEW (3) 7:2;119:18;120:4</p> <p>Max (3) 11:15;14:15;110:1</p> <p>maximum (2) 58:18;231:16</p> <p>may (59) 13:21;19:22;21:21;22:19; 23:1,7,18;30:13,13;31:5;</p>	<p>37:4;38:16;43:4;46:15,17; 51:24;58:8,17;68:20;71:13; 73:2,11;76:5,25,25;78:7; 86:12;104:15;105:9,9;106:9; 110:4;114:15;119:21; 122:25;126:17;127:1,2; 131:13,25;144:14;147:8; 152:24;158:14;170:11; 183:4,19;188:25;190:16; 196:2;201:3;215:22;219:6, 17;221:11,14;224:14,15; 232:25</p> <p>maybe (26) 15:21;29:4;46:12;75:1; 76:10;78:1;108:6;116:24; 126:14;138:25,25;152:23, 25;153:9;155:18;156:4; 157:17;167:2;170:10;189:6, 18;195:2;217:25;226:17; 229:20;230:6</p> <p>McCain (3) 26:7,12;39:24</p> <p>McCain's (2) 26:20;31:15</p> <p>McHugh (60) 7:3;11:19;13:7,9,23;14:9, 12;25:4,15;26:6,18;27:3,6; 31:13;39:10,12,13,17,20,22, 23;40:2,6,13,22;41:6,8,19, 20;42:2;48:25;51:7,14,16,20, 21;56:19,25;57:2;58:24; 59:2,3,21;60:2,3;63:14; 73:11;83:9;97:20;102:20,21; 212:24;213:3;216:9,12,15, 17;219:10;235:7,12</p> <p>mean (21) 13:7;26:20;34:7;73:12; 75:24;82:16;87:8;95:2; 115:15,16;131:21;132:19; 148:13;150:14;155:13; 167:18;178:21;191:25; 195:15;217:14;223:18</p> <p>meaning (1) 136:19</p> <p>meaningful (1) 131:22</p> <p>means (7) 31:25;69:2,24;126:22; 162:25;187:12;192:2</p> <p>meant (5) 13:9;123:4;188:17,19; 193:1</p> <p>meantime (1) 143:4</p> <p>measure (2) 115:6;131:22</p> <p>measured (9) 62:19;90:9,25;91:4,5; 99:18;129:18;197:22;198:1</p> <p>measurement (4) 91:10;197:21;198:9,14</p> <p>measurements (5) 62:24;91:15;99:23,24;</p>	<p>100:3</p> <p>measuring (1) 130:7</p> <p>mechanism (2) 110:20;191:9</p> <p>meet (4) 155:4;156:1,23,25</p> <p>meeting (4) 54:11,19;171:15;174:17</p> <p>meetings (6) 122:17;176:21;182:18,19, 22;214:5</p> <p>meets (2) 153:18;200:17</p> <p>melt (1) 91:1</p> <p>member (11) 92:17,20;107:15;118:9; 138:5,10,14;169:12;203:15, 20;214:1</p> <p>members (9) 53:8;114:12;118:4; 133:23;169:18;186:22; 187:17;211:25;213:23</p> <p>memo (5) 33:7;182:10,23,24;185:15</p> <p>memorable (1) 172:17</p> <p>memorize (1) 185:6</p> <p>memorized (3) 50:1;62:13;92:19</p> <p>memory (2) 208:7;234:13</p> <p>mentioned (6) 19:24;85:8;91:25;117:13; 177:21;181:25</p> <p>met (1) 161:20</p> <p>method (17) 35:4;87:3,8,9,9,10;99:21; 101:6,7;133:21;137:20; 166:7;184:19;203:3;217:21; 218:19;226:4</p> <p>Methodology (178) 7:16;10:14;17:5;18:4,17, 25;20:3;21:1,24;22:1,10,18, 20,24;38:4,7;41:5,24;43:16; 44:14;49:3;63:19;64:3,7,10, 15,18;66:1,17,25;67:14,18, 23,24;71:6,10,12;75:7,10,21; 78:9,21;79:18,24;80:10; 81:17,23;82:22;83:20;94:5, 6,10;95:14;98:12,20;107:6, 23;108:25;109:1;113:9; 116:14,17;117:9,18,25; 119:1;121:6;123:8,11; 124:24;130:6;132:11,24; 133:23;135:13;136:12,16,18, 25;137:8;138:6;140:24,24; 141:19;142:6,8;143:2,9,13; 144:1,22;150:6,15,17; 151:21;153:1;156:24;157:4,</p>	<p>15;158:10,10;159:17;160:2; 161:5;162:1;165:22;166:11; 167:15;168:7;169:8;170:3,7, 19;171:1,6,24;172:5,10; 173:1,6,9,14,16;174:1,24; 175:3;177:1;178:8,19,25; 179:2;180:12;182:2;183:19; 184:11;188:5;191:14;193:1; 196:18,22;197:10;200:12; 201:15;202:6,15;203:13,16; 204:10;205:4,7,14;206:3,16, 17;207:11;209:10;211:21; 212:1,10;213:14;214:7; 215:9,20;216:21;218:8; 219:3,8;223:21;226:9;227:9; 228:4,9;231:9,21,25;232:11; 233:11,13</p> <p>methodology's (1) 108:16</p> <p>methods (5) 130:23;152:24;183:12; 184:1;218:14</p> <p>metric (26) 68:19;137:22;142:16; 170:24;178:24;192:7; 193:24;195:13,15,21,25; 199:12;203:5;226:19;227:4, 5,6,8,13,14,16,20,20,24; 228:13,13</p> <p>mic (1) 27:18</p> <p>microphone (7) 14:20;15:1,6;32:3;88:16; 105:25;106:1</p> <p>mics (1) 14:17</p> <p>mid (1) 113:20</p> <p>mid-1980s (11) 52:11,20,23;53:6;55:14; 113:15,23;114:3,10,16;115:1</p> <p>middle (3) 76:23;85:14;97:20</p> <p>might (27) 10:24;16:12;24:16;25:15; 31:18;34:1;38:18;51:16; 65:19;69:3,5;91:9;105:25; 109:10;112:9,12;151:11,17; 189:3,22;201:7,13;225:16, 16,17,17;226:4</p> <p>mile (1) 162:21</p> <p>miles (1) 162:21</p> <p>Milner (5) 123:3;124:1,9;178:4,12</p> <p>mind (8) 65:22;106:14;116:3; 131:20;151:2;166:23; 196:10;201:13</p> <p>mindful (1) 15:10</p> <p>minds (1)</p>
--	---	--	--

<p>188:21 mine (1) 50:7 Minidoka (22) 11:13;43:4;47:9;52:13; 55:17;75:23;77:1;78:6;90:6; 10;92:10,16;101:8;110:21; 113:16,24;123:3;124:1,9; 178:12;186:19;187:17 minimis (2) 82:19;103:20 minusing (1) 89:17 minute (5) 45:14;129:10;134:6; 138:9;185:21 minutes (5) 31:22;32:16;87:23; 196:12;230:2 mischaracterization (1) 147:6 missed (1) 135:20 missing (2) 50:2;235:16 misstated (1) 59:23 misstates (1) 104:2 mistake (2) 202:25;208:3 misunderstood (1) 149:12 mitigate (3) 86:4,7;98:19 mitigating (2) 79:13;115:6 mitigation (20) 50:10;74:18;83:15,25; 84:16;85:2,10;86:20,22; 87:11;101:24;102:6;109:9, 13;110:14;111:23;115:9,11, 14;207:4 mix (6) 152:23;153:2,3;154:7,17; 193:7 mixed (2) 70:3,4 mixture (1) 195:2 mode (3) 43:14;48:22;227:7 model (82) 17:23,24;42:12;43:2,13; 44:5,6,9,10,12,13,21,24; 45:10,11,15,15,25,25;46:2,4, 8,11;47:7,19,23;48:2,6,10; 55:3,4,11,25;57:10,20,25; 60:19,22;62:16,17;64:24; 68:3,9;69:9,18,19,22;70:22; 71:3,5,9,22,23;72:13,14; 74:25;83:17;89:2,6,7,17; 90:9,11,12,14;93:3,6,10;</p>	<p>98:18;108:18,21,21;111:5, 14;128:14;141:23;189:9; 192:22,25;200:8,9;205:19 modeled (1) 87:12 modeler (2) 63:16;93:1 Modeling (48) 7:23;38:21,22;43:21; 60:17;63:18,20,23;64:3,14, 17,22;65:1,3,5,5;67:13,16, 20,21;74:16;75:12,14;76:5; 77:12;81:12;97:7,13;102:2; 107:16,25;108:19;109:2,4,6, 8,11;110:19;111:10,17; 113:17;117:4,14;174:23; 190:20;212:8,15,17 models (2) 48:3;189:15 Modification (3) 133:21;137:20;203:3 modifying (1) 175:24 moment (12) 40:5;53:11;66:6;74:22; 80:25;85:8;146:9;181:7; 185:12,15;207:24;208:7 monitor (1) 128:21 monitored (2) 128:5,8 monitoring (3) 117:4;128:7;184:12 month (5) 17:16;96:5;130:13; 167:24;168:4 monthly (8) 46:25;47:4,17;48:20;63:3, 4;100:4;193:12 months (2) 120:25;170:8 moratorium (2) 50:10;111:22 more (41) 10:7;15:14;18:21,22;21:5; 29:14;31:18;34:1,6;35:3,19; 72:20;74:17;75:1,86:19; 88:2;92:9;111:2;118:13; 128:18;131:21;150:21; 156:16;163:22;175:9; 176:19;187:13;192:14,15; 195:5,10;206:13,18;207:2,3, 10;211:17;224:17;226:17; 227:23;228:21 morning (20) 12:13;24:1;33:1;39:23; 41:20;60:15;96:22;123:17; 128:9;141:21;147:10; 174:22;229:18;230:1;231:2; 233:18;234:9;235:5,21; 236:4 most (11) 10:2;33:23;34:8;36:2;</p>	<p>79:7;110:19;175:20;210:18; 211:12;228:12;235:13 motion (11) 16:6,9,13;17:4,6;19:4,4; 234:7,8,11,11 motions (3) 23:8,10,10 Mountain (1) 11:24 move (20) 29:7,17;44:23;95:14;96:9; 109:15;124:1;146:21;158:3, 11,23;159:5,9;169:3;180:14; 185:14,23;205:18;230:9,12 moved (1) 186:1 moving (1) 27:8 much (10) 50:16;61:25;90:3;91:1; 99:24;127:3;163:1;187:5; 196:6;206:17 multi-linear (1) 186:18 multiple (1) 233:13 multiply (1) 193:6 municipal (1) 94:3 Murphy (3) 144:11;145:2,7 must (5) 18:4;110:14,14;112:12; 172:17 mute (3) 27:17,20;32:3 muted (3) 14:2;27:12;31:25 myself (5) 68:20;84:15,20;112:8; 172:20</p>	<p>122:3;137:22;142:16; 170:24;181:12;192:7; 193:24;195:25;226:18; 227:4,6,7,21;228:13 nearby (1) 56:3 necessarily (2) 21:10;233:22 necessitated (1) 64:14 need (38) 13:4,20;15:10,17;31:5,17; 32:25;35:9;41:9;51:25; 62:17;70:4;93:5;129:14,16; 130:4;131:10;146:3;151:9, 17,24;153:3,6,14,15,24; 154:1;157:20;158:6;173:19; 193:3,10,16;196:7;199:3,4; 227:9;235:6 needed (4) 10:6;45:20;127:18;170:18 needing (2) 35:23;56:17 needs (9) 45:19;122:2;125:15,18; 148:14;155:4;156:23;157:9; 189:10 negative (2) 187:7,8 negotiations (3) 159:15,19;206:6 neighborhood (1) 128:24 neither (1) 83:3 net (3) 191:21,24;192:2 Netter (1) 179:12 new (14) 19:17,21;50:10,11;111:22; 136:24;142:25;158:10; 178:2,11;224:2;225:22,24; 228:6 next (21) 29:1;60:9;76:22;80:14; 83:7;95:20;102:17;106:4; 119:15;138:18;139:2,5; 140:16;184:16;202:20; 205:5;208:25;221:12,15; 225:19;229:3 nice (2) 124:21;155:9 night (1) 236:5 nine (2) 121:20;143:10 nitpick (1) 155:14 noise (1) 100:5 non-Department (1) 218:9</p>
N			
<p>name (10) 37:8;60:15;92:23;96:22; 106:17,19;110:2;120:2,4; 161:18 naming (1) 152:6 narrative (1) 126:5 natural (10) 43:9;73:17;181:12,13; 183:11;184:1;190:13; 213:23;224:10,12 nature (1) 16:1 near (27) 43:3;47:9;52:12;55:17; 75:23;77:1;78:6;90:5,10; 92:9;110:21;113:15,24;</p>			

<p>none (4) 26:16;51:11;93:25;212:12</p> <p>Nonirrigated (2) 139:5,16</p> <p>non-irrigated (18) 68:12,25;69:2;88:22; 140:6,12,17;141:14;142:13, 17;156:3;195:22;221:2,14, 20;222:9;223:10;226:23</p> <p>non-irrigation (1) 164:11</p> <p>noon (1) 30:16</p> <p>normally (2) 10:4;214:17</p> <p>North (18) 37:12;61:11,15;73:16; 78:2,4,10,23;79:19;85:16,18, 21;86:19;99:6,15;100:19; 186:19;187:17</p> <p>note (2) 31:15;76:11</p> <p>notebook (4) 124:25;133:7,7;134:25</p> <p>notebooks (1) 136:4</p> <p>notes (5) 202:24;203:21,25;204:1, 11</p> <p>notice (9) 31:23;38:17;124:3,4,8; 148:7,9,10,11</p> <p>notified (2) 53:12,16</p> <p>November (13) 49:8;97:3,8;102:2;112:4; 130:20;174:14;175:12,15; 177:12;181:23;184:23;185:5</p> <p>NRCS (1) 164:14</p> <p>number (46) 27:6;41:1,3,9;52:5;55:2, 11;57:24;62:12;69:14;72:12; 73:23;74:10,23;101:21; 112:7;129:6,8;130:14; 133:12;134:11,12,14; 135:18;136:9;137:10;142:9; 154:20;164:21,25;165:3; 179:2;185:10;187:14;188:1; 192:4;193:21,22;195:24; 203:14;204:3,5,14;222:3,7; 228:14</p> <p>numbered (7) 24:7;26:16;28:7;51:19; 59:13;134:1;137:25</p> <p>numbering (6) 23:14,17;25:25;28:9,22; 29:15</p> <p>numbers (20) 23:15;24:4,21;25:13; 40:16;49:15,15;51:17;99:3, 10;123:10;129:6;130:11,18; 132:24;135:4;141:16;</p>	<p>202:21;204:17;221:24</p> <p style="text-align: center;">O</p> <p>object (6) 129:1;146:2,24;159:23; 168:18;206:8</p> <p>objected (1) 206:9</p> <p>objection (29) 15:9;17:8;21:19;24:10; 28:7;59:8;103:10;104:2,15, 18;105:6;109:17,19;112:25; 124:6;146:8,23;149:18,20; 180:16,18;185:16,17;186:2, 3;210:20;211:1;230:20,22</p> <p>objections (9) 14:13;15:5;22:22,23; 24:12;51:10;59:11,12; 105:24</p> <p>obligation (5) 20:19;83:15;84:17;85:2,10</p> <p>obligations (1) 87:11</p> <p>observation (2) 90:3,3</p> <p>observations (2) 90:14,21</p> <p>observed (3) 90:17,18;105:23</p> <p>observers (1) 15:14</p> <p>obtain (2) 91:16,21</p> <p>obtainable (1) 127:25</p> <p>obtained (1) 91:23</p> <p>obviously (2) 34:7;73:20</p> <p>occupation (1) 106:23</p> <p>occur (6) 19:20;61:20;62:25; 110:22;152:14;211:24</p> <p>occurred (4) 53:2;55:21;62:19;207:11</p> <p>October (7) 58:9,22;73:2,13;74:11; 170:10,10</p> <p>odd (1) 180:18</p> <p>off (17) 41:11,13;62:19;66:5,8,10; 88:16;100:15,20;119:10; 127:11;170:16;171:10; 193:4;210:16;235:17;236:6</p> <p>offer (13) 13:25;23:8,11;51:8,8; 149:14;231:6,6;232:16,17, 20,21;233:2</p> <p>offered (3) 29:18;34:13;149:15</p>	<p>offering (1) 147:5</p> <p>office (1) 26:2</p> <p>OFFICER (160) 10:1,11,24;11:8;12:19; 13:3,8,12,19;14:11,18;15:19, 24;17:12;19:5;20:6,8;21:17; 23:9;24:13;26:1,14;27:1,11, 15,19,23;28:6,15,20,24;29:1, 12;30:20;31:1,23;32:13,18; 33:3,7;34:4,9,25;35:2,12,25; 36:7,17,20;37:2;39:7,12,18; 40:5,11,14;41:11,14;51:10, 16;56:19;59:1,8,12,16,19,22; 60:1,4,12;63:7;65:12;66:7; 87:16,22,25;88:17;95:6; 96:14;97:13;102:10,16,22, 24;103:2,11;104:4,17;105:5, 13,21;106:9;109:17,25; 110:4;115:23;119:6,10,14, 21;124:2,6,13,17;129:4; 146:7,23;147:9;148:2,8,22; 149:3,5,15,18,23;150:11; 155:7;159:25;161:11,13; 166:17;168:20;180:16; 185:16,20,25;196:6,11,14; 206:11;210:25;212:21; 213:1,4,8;216:8,11,14; 219:12;222:16;224:19; 228:19;229:1,8,15,19,23; 230:4,11,17,20;231:8;233:5, 20;234:6;235:10,19;236:1,3</p> <p>official (5) 124:3,4,8;158:12;214:20</p> <p>officially (2) 14:6;63:17</p> <p>offset (1) 110:15</p> <p>off-the-cuff (2) 230:2;231:2</p> <p>Often (3) 33:7;176:9;225:23</p> <p>old (4) 10:1;143:5;201:2,12</p> <p>Olenichak (4) 15:20,25;91:18;211:12</p> <p>Olsen (1) 12:4</p> <p>Olson (3) 12:9,12;36:10</p> <p>once (6) 40:9;42:18;101:9;195:8; 226:7;228:14</p> <p>one (88) 13:15;20:2,9;25:14,16; 32:14;35:19;40:14;43:25; 56:21;57:11;60:23;64:4,23; 72:23;76:6;84:5,10;87:9; 89:15;105:22;116:16;122:3, 22;125:2,9;131:2;133:9; 138:5;139:9,10,14;142:13; 145:17;148:1;149:1,9;</p>	<p>163:12;166:1,1,4;171:4,20, 23;173:10,11;178:5;180:4; 181:25;182:8,13;183:19; 184:14,23;186:22,25;187:7, 8,8,8;188:5,7,23,25;189:23; 193:19;203:9;215:1,22; 216:20,21,21;220:17;221:11, 15;222:6;223:16,24;224:1,2; 225:24,24;226:4,16;227:9, 12;228:21;234:18</p> <p>one-page (1) 157:23</p> <p>ones (7) 29:10;34:7;70:9;106:13; 175:20;188:7;215:18</p> <p>one-way (1) 18:13</p> <p>on-farm (2) 126:19;127:15</p> <p>ongoing (2) 101:23;205:24</p> <p>online (3) 10:9;88:15;229:5</p> <p>only (19) 19:14;35:7;40:17;54:4; 70:1,2;87:9;89:15;94:8; 100:8;109:9;133:9;153:22; 154:19;189:5;202:2;211:7; 215:18,21</p> <p>open (2) 156:2;179:5</p> <p>operating (1) 19:23</p> <p>operational (2) 127:13,25</p> <p>operations (2) 128:23;163:1</p> <p>opinion (9) 103:8;104:1,13;108:9,14; 110:19;214:20;223:13; 225:12</p> <p>opinions (4) 104:23;108:2,6,7</p> <p>opportunities (2) 34:22,23</p> <p>opportunity (6) 16:8;29:4;34:17;35:5; 104:5;123:17</p> <p>oppose (2) 16:13;34:4</p> <p>optimum (2) 231:13,15</p> <p>option (2) 40:22;229:6</p> <p>orally (1) 16:14</p> <p>Order (201) 7:11,12,17;10:15;16:3,21, 22,22;17:2;18:4,17,20; 19:24;20:3;21:24;22:1,11, 18,20,24;29:20;30:23;32:8; 33:2,17;38:5,8;39:9;40:25; 41:5,7,9,23;42:5,16;43:16;</p>
---	---	---	---

<p>44:14;52:1;55:10,23;56:12,15;57:5,15;59:5;61:11; 63:19;64:3,7,11,15,18;65:25; 66:17,25;67:14,18,23,24; 71:6,10,12;72:23;75:7,10,21; 78:9,21;79:18,24;80:10; 81:17,24;82:22;83:8,9,20; 86:14;94:5,10,12,17;95:14, 23;96:1,8;98:20;101:1; 102:19;104:20,24;107:6,24, 24;109:1;111:2;113:10,10; 116:13,17;117:9,18,24,25; 121:6;123:8,11;124:24; 125:8;130:6;132:11;134:9; 135:12;136:12,13,16,18,25; 137:8;140:24,24;141:19; 142:6;143:2;144:2,4,22; 150:6;151:21;153:1,23; 156:24;157:4;158:10,10,16, 19,21;159:17;160:3;162:1,9; 165:22;168:7;169:8;170:7; 171:1,6,24;172:5,10;173:1,6, 9,14,16;174:1,24;175:3,7; 176:22,24;180:12;181:18; 182:2;184:11;186:24; 188:15,24;191:14;196:18, 22;197:10,22;198:9,14; 200:12;202:6;203:16; 204:10;205:4;206:3;207:11; 209:10,11;211:21;212:1,10; 213:15;214:7;218:8;224:25; 228:4;230:1;231:2,4,9,21,24; 232:12;233:15</p> <p>orderly (2) 152:15;153:20</p> <p>orders (7) 17:9;48:13;59:5;71:14; 108:25;132:24;216:21</p> <p>ordinarily (1) 19:16</p> <p>original (4) 19:24;70:8;122:24;127:22</p> <p>Originally (3) 147:12;170:22;200:24</p> <p>others (10) 13:12,21;84:15,20;102:24; 165:14;169:6;205:12; 216:24;220:11</p> <p>other's (1) 130:16</p> <p>Otherwise (1) 14:4</p> <p>ought (1) 230:7</p> <p>out (38) 13:22;20:10;25:17;27:25; 31:3;54:21,22;61:18;62:3; 85:9;89:17;92:11;93:11,24, 25;95:22;96:4;100:12; 106:14;118:12;126:14; 132:2;141:1;157:21;176:17; 177:4,6,10,15,19,21;192:21; 193:19,25;194:24;215:17;</p>	<p>217:21;232:19</p> <p>outcome (2) 56:6,18</p> <p>outflow (2) 61:17;91:6</p> <p>outflows (2) 91:11;92:18</p> <p>output (11) 44:5,9,9,10;46:5;48:6,7,10, 11,16;57:25</p> <p>outside (7) 22:20;65:6;74:5;127:11; 174:20;194:10;219:7</p> <p>outspoken (1) 15:10</p> <p>over (17) 23:18;30:9,15;53:2;109:3; 112:10;126:3;127:7;134:7; 137:14;140:16;153:16,16; 187:19;202:17;225:9;227:15</p> <p>overestimated (1) 111:1</p> <p>overhead (1) 14:20</p> <p>overlap (2) 40:7;194:14</p> <p>overlaps (2) 194:9,12</p> <p>Overlay (1) 156:4</p> <p>overrule (2) 146:8;210:25</p> <p>Overruled (2) 129:4;168:20</p> <p>oversee (1) 121:3</p> <p>overseeing (1) 169:12</p> <p>oversight (1) 142:14</p> <p>overstates (1) 202:15</p> <p>own (1) 170:12</p> <p>owns (1) 204:5</p>	<p>190:4;191:16,17;196:19,20; 203:17;207:23;208:1,2,3,4; 209:1;213:17,20;215:3,5,6</p> <p>pages (10) 50:4,6,7,8;51:18;97:4; 113:14;134:1;137:25;139:12</p> <p>Palisades (2) 162:20,21</p> <p>paper (3) 24:2,8;25:10</p> <p>paragraph (25) 43:18,21,23;125:7,13; 132:9;136:17;150:20;152:8; 160:5,8,17;162:5,6;165:25; 183:8;190:9,12,16;191:18, 20;196:21,24;213:22,24</p> <p>paragraphs (2) 97:20;213:21</p> <p>paralegal (1) 26:2</p> <p>parameter (1) 210:17</p> <p>parameters (2) 90:15;210:14</p> <p>paraphrasing (1) 231:19</p> <p>Pardon (1) 230:11</p> <p>parenthetical (2) 127:5,13</p> <p>part (37) 16:10;20:11;22:1,5,9,11; 53:20;62:15;63:1;69:3,3; 77:11;79:11;94:11,12,16; 97:8;102:5;142:14;144:4,12; 153:1,3;155:18,24;157:4; 165:6;168:24;171:4,16; 176:1;180:7;190:22;202:25; 217:15;234:15;235:13</p> <p>partial (2) 147:2,22</p> <p>participants (1) 14:1</p> <p>participate (8) 53:24;54:2;67:3;94:14,20; 107:18;117:13,16</p> <p>participated (2) 72:18;172:7</p> <p>participating (11) 10:9,25;13:5,15,16,24; 15:7;54:14;105:23;117:5; 235:15</p> <p>participation (1) 13:23</p> <p>particular (7) 21:14;22:8;23:5;69:13; 108:1,15;112:18</p> <p>Particularly (3) 32:19;33:19;108:12</p> <p>parties (44) 14:6;15:15;16:20;17:15; 18:1;23:8,10,15,19,23;24:9, 13;25:20;28:17;29:2,10,18;</p>	<p>31:2;32:20;33:13,17;34:15; 35:21;38:17;53:12;60:6; 75:15;97:13;123:3,16;124:7; 182:20;183:1;217:13,14,14; 218:2;229:6,9;233:15,22; 234:2,23;235:14</p> <p>parties' (1) 214:6</p> <p>party (1) 28:5</p> <p>passage (2) 171:2,14</p> <p>passed (1) 191:11</p> <p>passes (2) 143:17,18</p> <p>past (2) 10:6;62:18</p> <p>patience (1) 206:14</p> <p>PATTERSON (14) 12:11,11;24:1,20;25:14, 16;26:9;27:4,8,17,21,24; 28:19;40:18</p> <p>PDF (1) 54:20</p> <p>peculiar (1) 17:16</p> <p>pending (3) 15:18;16:7;23:7</p> <p>people (10) 10:9;14:5,17;28:11;31:4; 53:19;54:17;79:9;118:14; 233:11</p> <p>percent (10) 51:1,1;97:21;112:10,16; 143:10;164:19,23;165:1; 178:17</p> <p>percentage (5) 74:8;76:14;84:2;101:9; 164:18</p> <p>percentages (1) 85:1</p> <p>percolation (2) 126:21,23</p> <p>perfect (1) 105:15</p> <p>perform (4) 169:16,18;175:13;209:16</p> <p>performed (3) 64:22;82:1;93:10</p> <p>performing (2) 171:13;172:2</p> <p>perhaps (5) 57:23;112:9;201:13; 229:21;232:9</p> <p>period (1) 47:18</p> <p>periods (3) 46:25;47:4;48:20</p> <p>permissible (2) 138:16,22</p> <p>permitted (1)</p>
	P		
	<p>pack (3) 164:18;165:22;167:20</p> <p>PAGE (73) 7:2;43:18;49:15,20,25; 51:18,22;52:8;72:6,25; 74:22;80:22,23;82:7;83:13, 14;97:17;98:6;108:5;112:7, 13;113:12;117:21;125:7,11, 13;126:3,4;127:5,24,24; 129:10;132:3;134:2;135:15, 16;136:9;138:1;139:18,19, 20;150:21,24,25;152:9; 160:6;162:3,4,5;164:16; 185:8,10,11;186:10,12,15;</p>		

232:5 person (5) 54:13;124:22;161:21; 211:15;229:16 personally (2) 54:22;210:4 perspective (2) 129:25;223:13 pertaining (1) 21:10 pertinent (1) 17:10 Pete (3) 11:6;34:14;35:10 petitioners (2) 16:10,14 petitions (1) 15:18 photo (1) 156:4 photography (2) 68:17,18 photos (1) 156:9 physical (3) 15:3;90:3;229:13 pick (1) 15:7 piece (2) 157:13;235:9 pieces (3) 154:9;198:25;199:2 piqued (1) 167:1 place (9) 10:13;18:20;35:16;45:20; 126:13;138:16,22;198:20; 232:11 places (2) 78:23;90:19 Plain (7) 50:11,15;74:3;93:14; 117:2,8;141:13 Plain's (1) 128:6 plan (1) 102:6 planned (2) 169:4;175:24 planning (1) 117:7 plans (2) 84:1;101:24 plants (1) 127:1 played (2) 38:10;121:13 please (19) 27:17;28:2;32:3;36:23; 37:2,7;72:6;104:6;106:5,18; 107:4;120:2;132:4;133:17; 135:11;137:18;138:3;173:2; 219:25	plug (2) 228:3,14 pm (1) 236:7 Pocatello (9) 11:16,18;12:3;30:22; 60:16;65:23;124:21;147:13; 167:22 POD (1) 94:2 podium (2) 124:17;213:2 point (20) 23:9;32:14,15;51:7;79:10; 105:7;143:12;144:7;159:1,3; 189:16,20;191:7;194:2; 219:5;224:16;226:2,12; 227:10;230:6 points (2) 55:6;164:6 policy (7) 71:25;81:10;104:23; 111:18,19;208:14;231:16 polygons (5) 68:17;69:7;140:5;141:13; 194:13 portion (7) 28:2;57:8;76:11;85:18; 166:12,12;175:10 Portneuf (13) 92:12,14;163:21;164:19; 165:18;167:5,14,16,19; 168:1,3,5,9 posed (1) 105:10 position (3) 38:2;105:2;120:24 possible (9) 22:18;29:15;33:9;114:13; 132:2;189:9,11,19;199:18 post (1) 164:15 posted (2) 67:12;118:24 posts (1) 164:10 potential (1) 214:6 potentially (1) 21:3 PowerPoint (11) 49:5,10,24;54:10,15;93:4; 133:15,20;137:19;176:14; 203:2 PPU (3) 138:11,16;140:7 practice (1) 154:12 practices (8) 152:14,22;153:12,14,25; 154:16,18;191:19 precipitation (5) 69:11;70:16;129:17;	151:7;193:5 precise (1) 75:1 precluded (1) 19:23 predecessor (1) 44:8 predict (7) 43:2;44:13;171:17; 181:20;188:20;192:22;214:8 predicted (18) 54:24;57:14;58:8,20; 72:20;73:1;74:17;76:12,19; 78:24;79:13;82:2,9;86:13, 14,18;110:15;113:8 predicting (6) 47:8;162:23;187:13; 213:23,25;224:11 prediction (4) 162:11;193:14,15;225:8 predictions (2) 206:18,21 predictive (1) 182:3 predictor (2) 181:16;189:12 predicts (2) 224:9;225:3 prefer (1) 39:9 preference (2) 229:8;235:23 pre-hearing (2) 23:10;36:4 Preliminary (8) 7:21;15:16;34:12;156:13, 16;173:20;175:5,9 preparation (2) 77:24;96:8 prepare (5) 17:19;44:16;96:8;141:11, 11 prepared (13) 16:2;33:6;49:6;66:24; 67:1;72:17;76:8;133:15; 159:18;162:14;164:14; 167:7;230:17 preparing (5) 16:3;57:7;96:1;145:4; 169:11 prescribed (1) 98:11 present (7) 16:14;31:10;44:18;82:4; 95:3;145:4;172:11 presentation (30) 22:16;35:8;49:2,5,11,24; 54:5,8,12,16;55:7;67:7,11, 17;72:4;93:5;97:3,8,18; 112:4;130:25;133:20; 174:25;176:15;178:22; 185:3,6;202:22;203:2;230:8 presentations (5)	129:6;149:5;174:14,19; 203:10 presented (21) 18:8;21:18;54:19;63:21; 93:4,16;125:19,22;131:9; 133:23;137:22;148:11,16; 175:12,15,21;176:5;180:2; 184:22;232:24,25 presenting (2) 170:9;232:22 presently (1) 106:21 presume (1) 111:12 pretrial (1) 35:20 pre-trial (2) 24:10,25 pretty (4) 67:22;73:25;160:2;196:3 previous (10) 46:6;47:15;70:12;99:20; 130:13,13;132:23;178:17; 223:22;225:24 previously (1) 102:19 primary (2) 20:2;229:12 principal (1) 106:24 principle (1) 208:20 printout (2) 133:20;137:19 prior (26) 16:19;18:6;19:18;22:5,15; 44:22;46:17,24;47:7;48:10; 67:17;75:20;78:9;88:7; 107:13;108:24;112:23; 113:4,22;115:16,17;158:16; 169:7;185:23;234:25;235:1 priority (21) 38:23;42:12,14;49:3; 51:23;52:9,20;57:9;58:11; 72:7;73:15,18;77:14;113:12; 115:17,18;165:16;169:2; 204:20;205:2;233:16 probably (19) 10:16;11:1;18:16;26:23; 32:15;89:10,12;94:23,25; 103:24;106:12;139:11; 196:8,9;205:3,12;211:4; 217:24;226:13 procedures (2) 108:1;172:22 proceed (2) 30:13;170:6 proceeding (9) 18:3,7;27:10;75:19;82:24; 131:3;159:24;172:13;210:24 process (10) 105:3;131:17;140:20; 142:22;160:8;172:14,21;
--	--	--	--

<p>180:8,13;214:17 processes (1) 142:19 Processing (2) 139:9;196:1 produce (5) 52:11,20;85:22;113:15; 147:11 produced (7) 28:5;56:24;64:4;70:11,13; 97:8;102:2 producing (1) 56:24 professional (4) 37:15;103:8;104:13; 120:10 program (1) 128:7 progression (1) 186:25 Project (18) 122:9;125:8,14;126:6; 129:13;130:1,2,7,22,25; 131:4,10,19,22,24;154:9; 156:15;193:11 promote (1) 15:4 prompt (1) 152:19 pronounce (1) 92:23 proof (7) 221:4;231:6;232:16,17,20, 22;233:3 proper (1) 109:1 Proportionate (17) 7:23;42:15;57:11;76:4,19; 83:15,22,24;84:2,16;85:1; 86:25;87:6,11;100:25;109:7; 114:23 proposal (5) 34:5;131:12;191:2,3,5 proposed (12) 16:18;29:17;101:6; 133:20;137:20;158:23; 159:14;176:22,22;190:19; 191:9;203:2 proposing (1) 132:1 protect (1) 20:19 protest (1) 147:14 protocol (2) 152:15;153:20 provide (21) 42:7;49:10;54:15;63:18, 24;78:11,24;79:1,2,22,23; 80:5;86:19,22;87:3;94:6,16; 95:17;117:11;123:4;165:11 provided (14) 45:19;63:20;79:17;</p>	<p>101:13;104:21,25;123:2,13, 16;131:3;147:24;179:25; 195:10;218:22 provides (4) 19:13;70:19;72:11;186:20 providing (2) 86:4,7 provisions (1) 147:3 public (6) 81:10;208:14;231:12,14; 232:9;233:25 publicly (1) 172:9 public's (1) 20:19 published (1) 174:7 pulling (2) 126:17;202:23 pumping (22) 50:15;51:2;52:23;53:5; 70:18;79:9;82:19;86:6; 103:19;108:13,23;111:25; 112:11,17,23;113:4,23; 114:4,7,9,21;199:1 purpose (1) 69:18 purposes (4) 77:11;132:10;139:17; 144:1 purview (1) 117:10 push (1) 228:5 put (7) 36:12;90:12;104:8;152:1, 11;160:19;223:12 putting (1) 79:5</p>	<p>quotes (3) 231:20;234:12,18 R R-2 (1) 224:8 Racine (2) 12:9,11 raise (1) 233:11 raised (6) 14:19;33:23;172:12; 181:3;219:14;233:12 raising (1) 35:25 Ralph (1) 19:7 ran (1) 48:21 range (4) 23:18;24:4,21;192:17 ranges (3) 23:15;24:18;187:7 rather (5) 51:17;223:4,8;232:11,15 ratio (1) 125:14 reach (66) 43:4,7,10;47:9;50:23; 52:13;53:4,4;55:17;56:13; 58:12,19;61:2,5,6,10,15,19, 24;62:1,2,20;75:5,23;77:1,2, 6;78:6,11;79:4,7,22;82:19; 85:22;87:12;89:21;90:2,6, 21;91:1,2,5,6,7,14;92:6,15, 21;98:7,19;99:25;100:5; 101:9;103:20;108:12,22; 110:22;112:18,22;113:16, 24;114:1,5,8,20;157:5 reaction (1) 148:8 read (18) 21:23;22:3,12;51:21; 65:18;66:11,14;80:25;81:6; 152:11;157:14;161:20; 184:19;190:14;191:22; 197:1;207:24;234:10 reading (1) 151:2 ready (2) 35:12;41:14 real (1) 17:7 reality (1) 202:12 realization (1) 234:2 realize (2) 59:4;98:18 realized (7) 51:2;97:23;112:11,17; 175:23,25,25</p>	<p>really (11) 18:11;31:22;34:19;94:15; 100:14;115:11;143:22; 155:9;174:23;225:18;231:4 real-time (17) 122:3;137:22;142:16; 170:24;192:7;193:24; 195:20,25;203:5;226:19; 227:4,6,8,12,20,21;228:13 reason (7) 10:12;18:16,25;20:4; 93:24;189:6;232:4 Reasonable (36) 41:25,25;56:6,18;66:2,2, 18,19;81:10;112:21;113:2; 116:15,15;122:11;123:21; 130:8,14;133:21;134:10; 135:14,14;137:21;175:21, 24;176:2,7,9,13;184:20,21; 192:23;193:12;203:3; 208:14;209:2,6 reasonableness (5) 20:23,24;21:2,8;130:17 reasoning (1) 17:22 reasons (5) 19:3;20:2;182:1;223:24; 224:1 rebuttal (1) 233:19 recalculated (1) 178:12 recall (42) 45:6,11;46:9;51:25;52:2; 54:6;62:11;74:13;75:13,16, 17;77:23;79:14;80:7;81:25; 82:23;83:2,5;91:21;96:3,6,7; 99:1,14;101:1;103:5,14; 130:24;131:7;132:4,17,25; 142:3,4;172:12;191:1,8; 222:22;223:1,6;224:4;225:4 recalled (1) 105:9 receive (6) 22:8;86:20,23;148:13,17; 233:16 RECEIVED (20) 7:9;24:10;51:12,13;59:13, 24;109:20,21;138:21; 148:21;149:21,22;178:11; 180:21,23;183:17;186:4,5; 230:23,24 receives (1) 90:20 receiving (1) 83:5 recent (7) 18:22;19:2;155:13;156:4, 9,12;228:13 recently (1) 23:20 Recess (4) 87:24;105:17,20;196:13</p>
	Q		
	<p>QD (4) 160:10,18,22;161:3 qualified (4) 35:22;56:21;107:12; 210:19 quality (2) 130:10,10 quantify (1) 211:23 quick (2) 31:22;95:9 quickly (2) 127:9;229:25 quite (5) 121:10;132:5;151:19; 218:16;223:18 quote (1) 152:10 quoted (2) 20:15;21:9</p>		

<p>recharge (6) 53:1;69:10;90:13,20;99:5; 117:7</p> <p>recite (1) 24:17</p> <p>Reclamation (3) 15:13;162:16;167:8</p> <p>recognize (8) 65:15;66:21;76:3;182:13, 15;185:1;203:9;220:5</p> <p>recognized (2) 20:22;23:20</p> <p>recollection (2) 94:24;131:8</p> <p>recommend (4) 158:3;218:7,15;219:2</p> <p>recommendation (10) 159:13;173:20,25;174:2,6, 19;175:4;189:16;190:20; 191:11</p> <p>Recommendations (6) 7:21;157:17,22;218:11; 219:4;230:15</p> <p>Recommended (4) 65:24;66:16;166:5,8</p> <p>recommending (1) 223:9</p> <p>reconsider (3) 231:3;232:14;233:4</p> <p>record (37) 15:8;25:3,22;31:15;34:13; 37:8;40:9,23;41:12,13;51:9; 57:4;65:18;66:6,8,9,11; 87:25;105:22;106:18; 109:16;120:3;133:18; 135:11,17;136:2;137:18; 139:17;141:6;167:20;168:3, 14;196:15;220:1;235:8,11; 236:6</p> <p>recording (2) 41:15;88:1</p> <p>records (3) 91:24;180:11;199:16</p> <p>recross (2) 34:19;35:6</p> <p>Recross-Examination (2) 7:6;224:22</p> <p>Redirect (9) 7:5;33:16;34:19;35:6; 102:18,21;103:3;119:8; 222:20</p> <p>redo (1) 17:1</p> <p>reduce (1) 143:20</p> <p>reduction (1) 188:1</p> <p>refer (16) 25:6;27:4,6;28:4,17;29:21; 40:11;41:16;68:19;80:19; 83:24;93:5;108:4;116:16; 136:6;160:9</p> <p>reference (5)</p>	<p>151:7;157:21;158:6; 160:15;208:18</p> <p>referenced (2) 28:1;134:6</p> <p>references (1) 160:9</p> <p>referencing (1) 112:7</p> <p>referred (1) 69:23</p> <p>referring (4) 54:9;112:12;148:4;161:1</p> <p>refers (4) 20:12;81:20;187:3;203:24</p> <p>reflect (1) 85:11</p> <p>reflected (1) 176:15</p> <p>reflects (1) 203:18</p> <p>refresh (1) 208:7</p> <p>regard (2) 85:12;211:17</p> <p>Regarding (25) 7:13,18;10:14;13:22; 22:21;29:15;41:23;42:5; 53:13;57:5;66:1,17;97:19, 21;98:24;99:12;105:8; 116:14;117:17;135:13; 159:5;225:1;230:1;231:4,5</p> <p>regardless (2) 31:20;108:24</p> <p>regional (1) 108:11</p> <p>regression (19) 171:9,16,23;172:1;181:8, 11,19;182:4;184:9;186:18; 187:6,13,23;201:11;224:5,9, 15;225:1,3</p> <p>regressions (7) 165:9;187:5;188:14,14,18, 19,22</p> <p>related (21) 60:17;64:3;67:13,23,24; 78:20;81:13;82:22;117:3,6; 125:8;145:9;147:11,15; 174:23;180:1;205:21; 209:16;212:15,17;234:14</p> <p>relating (6) 36:25;42:11;106:7; 119:19;147:4,11</p> <p>relation (1) 119:2</p> <p>relations (1) 19:22</p> <p>relationship (2) 61:11;131:10</p> <p>relationships (1) 126:6</p> <p>relative (4) 81:16,23;216:20,24</p> <p>relatively (1)</p>	<p>187:18</p> <p>released (2) 158:17;178:5</p> <p>relevance (2) 22:23;211:2</p> <p>relevancy (1) 159:24</p> <p>relevant (3) 21:6;206:10;233:24</p> <p>reliability (2) 182:3;183:25</p> <p>reliance (1) 132:23</p> <p>relied (1) 231:24</p> <p>reluctance (1) 235:4</p> <p>rely (1) 188:22</p> <p>remained (1) 187:18</p> <p>remember (35) 24:17,18;104:6;129:7; 131:11,15,15;137:4;144:9, 14,17;158:22;159:19,20,22; 172:6,15,15;175:20;177:3, 18;178:15;183:3,16,22; 184:5;190:16;191:3;206:4; 209:12;210:16;212:15; 215:21;217:6;219:4</p> <p>remind (1) 35:13</p> <p>remote (4) 10:9;13:11;54:11;199:24</p> <p>remotely (6) 13:5,25;15:8;54:14; 105:23;235:15</p> <p>remove (8) 100:5;139:5;140:12,17; 142:13;194:9,11,16</p> <p>removed (10) 24:23;25:1,18;93:8; 139:15;140:5;156:7,8;222:8; 223:10</p> <p>removes (1) 194:21</p> <p>removing (3) 142:16;195:21;196:1</p> <p>rendered (1) 19:15</p> <p>renders (1) 108:18</p> <p>rendition (1) 19:20</p> <p>renumbered (1) 25:7</p> <p>renumbering (1) 23:20</p> <p>re-offered (1) 148:22</p> <p>repeat (7) 46:10;47:24;64:9;133:12; 157:1;173:2;218:17</p>	<p>repetitious (1) 73:12</p> <p>rephrase (1) 153:9</p> <p>report (16) 36:12;56:24;107:5,22; 108:4,5,7;109:23;110:18; 118:4,21;131:13,16;176:15; 190:23;233:1</p> <p>reported (5) 178:7,13;196:2;198:1,5</p> <p>reporter (5) 10:12,18,22;15:8;149:11</p> <p>Reporting (3) 10:23;11:3;193:22</p> <p>reports (4) 36:16;76:7;118:20;194:6</p> <p>represent (16) 12:5;60:16;85:25;96:23; 97:12;102:12;134:8;139:7; 145:17;151:6;157:22; 161:19;166:23;168:1;192:1; 205:1</p> <p>representation (3) 117:10;123:22;195:10</p> <p>representations (1) 192:9</p> <p>representative (1) 187:24</p> <p>representatives (1) 182:20</p> <p>represented (5) 15:13,15;124:9;191:21; 205:10</p> <p>representing (3) 12:16,18;124:21</p> <p>represents (2) 76:18;146:3</p> <p>request (5) 15:19,23;16:3;84:4,15</p> <p>requested (1) 16:20</p> <p>requests (2) 15:17;16:1</p> <p>require (5) 55:25;115:9,11,14;197:22</p> <p>required (4) 18:17;20:24;21:2;225:19</p> <p>requirement (4) 14:4;56:13;108:16;153:6</p> <p>requirements (1) 109:10</p> <p>requires (2) 118:3;146:12</p> <p>rerun (1) 228:8</p> <p>res (6) 17:23;18:3,10,15;19:14,16</p> <p>research (1) 19:10</p> <p>reserve (2) 28:4;147:23</p> <p>reserved (1)</p>
--	---	--	--

<p>30:1 Reservoir (5) 11:14;163:1,10;165:19; 169:1 reservoirs (3) 165:15;168:24;214:18 residual (2) 91:12,12 resolution (1) 122:4 resource (1) 234:1 Resources (10) 11:5;12:22,24;37:19; 65:24;80:16;120:14;231:13, 16,18 respect (7) 71:23;82:24;85:1;99:9; 100:24;101:18;169:10 respectively (2) 22:17;234:21 respond (3) 16:8;24:11;233:8 response (9) 16:8;50:24;58:8;72:20; 73:1;84:4;98:23;99:12; 217:12 Responses (2) 17:12;19:5 responsibility (3) 79:6;101:11,15 responsive (1) 28:2 rest (3) 21:15;36:13;108:7 restate (4) 112:15;114:24;153:8; 195:7 restroom (1) 87:20 result (12) 53:5;74:2;86:5,6,11;98:15; 114:9;187:11;206:17; 211:20,25;231:15 resulting (2) 112:23;113:3 results (5) 72:19;110:25;111:5; 170:9;176:8 return (34) 60:23;61:1,6;62:6,15,23; 89:17,18;91:8;99:10,13,18; 100:7,8,13,14,18,19;127:14, 17,20;128:4,5,6,13,17,19,22; 144:3,7,10,17,21;145:1 returned (1) 159:8 returns (5) 62:25;98:24,25;115:19; 127:21 reverse (1) 224:25 reversed (1)</p>	<p>18:5 review (27) 17:3;41:17;64:7,10;77:24; 107:23;130:16;165:24; 169:13,21,23;170:2,14; 172:4,9;175:2,7,11;176:16; 180:24;182:1;183:24; 190:17;197:9;209:3;223:17; 236:6 reviewed (6) 74:22;115:10;180:13; 189:22;209:8;234:12 Reviewing (10) 134:13;169:10,25;170:9; 171:1,24;174:6;188:6; 234:20,21 revised (1) 165:21 Revising (1) 183:11 Revisions (2) 65:25;66:16 Ribgy (1) 12:17 RIGBY (4) 12:17,17,17;14:16 right (106) 15:2,12,16,19;17:7;18:16; 20:18,18,25;23:6,7,13;27:3; 28:4;29:12,17;34:10;35:17; 36:20;38:8;39:8;41:8,11,16; 52:6,14;67:8;73:22,24;74:2, 12,13,23;76:23;78:4;85:20; 87:9;88:1;93:15;96:14;98:5, 17;101:18;102:17;105:15; 110:23;111:2,6,10,23;112:6; 113:7,17,19,25;114:6,12; 116:16;122:7,8;124:16; 125:10;128:4;129:9,19; 130:20;133:3;134:7;136:11; 137:7;139:17;140:1,14; 143:6,8;145:25;146:18; 147:1,6,12;154:18;158:14; 160:17;161:23;162:12; 163:19;164:2;166:25; 174:11;188:23;192:18; 194:7;196:11;198:4,21; 201:25;204:3,5,6;222:16; 225:6;226:11;227:7;234:6; 235:19;236:3 righted (1) 210:8 rights (42) 19:22;58:9;73:2,17,23; 78:10;93:8,12,13,23;115:14; 145:18;146:4,4;197:14,24, 25;198:3,6,7,11,12,16,25; 200:25;201:1,20,22;204:14, 16,20,21,23;205:2,3,11,11; 207:4;209:2;214:19;234:16; 235:1 Ririe (1) 163:10</p>	<p>RISD (1) 134:7 risk (1) 205:4 river (47) 43:7,10;51:2;52:13,25; 53:4;61:17,18,25;62:2; 73:18;79:4;89:22,24;90:1,4, 10,19,20,21,25;92:4,5;94:13; 98:7;100:10,10;110:21; 112:18,22;113:3;114:5; 138:15;162:19;163:11,15,21, 25;164:4,5,22;165:18;167:6, 14,19;181:12;211:10 road (1) 132:1 roads (1) 69:6 Rob (3) 11:22;88:5;161:18 Rocky (1) 11:24 role (3) 38:10;42:8;121:13 roll (3) 10:17;13:4,13 room (2) 14:19;128:9 rooms (1) 54:13 root (1) 126:25 rotation (1) 146:12 Rough (1) 143:11 roughly (12) 44:3;46:23;47:13;52:5,12; 53:11;55:16;56:4;141:18,20; 143:10;163:14 route (1) 126:17 routinely (1) 164:10 row (7) 10:21,21;73:5;85:18; 134:5;140:10;141:15 R-square (1) 186:23 R-squared (9) 171:23;184:14;186:25; 187:3,18;189:1;201:6; 224:13;225:10 rule (12) 22:22;80:23;81:6,11,15, 20;207:24,25;208:15;209:1; 234:9;235:4 ruled (1) 233:17 Rules (12) 80:15,20,20,25;81:2; 207:17,19,21,24;208:21; 209:7;211:6</p>	<p>ruling (2) 183:18;233:10 run (17) 46:2,5,6;57:20,24;71:9,18, 24;98:18;108:6;111:1; 112:21;113:2;178:19,25; 205:7,13 running (2) 71:16;127:10 runoff (2) 127:4,6 runs (10) 90:9;93:4,6,8,10,25; 111:10,14,17;113:4</p> <hr/> <p style="text-align: center;">S</p> <hr/> <p>safe (1) 151:13 Salmon (3) 92:7;100:11,13 same (32) 50:4;52:19;53:2;57:24; 99:23;102:18;125:18;130:4; 131:5;133:6,7;134:12;135:7; 139:15;140:19,20;141:8,10; 142:15;145:6;152:16;157:8, 8;163:18;165:1;178:13; 180:3;200:11;202:4;206:9; 220:21;228:12 Sarah (11) 11:17;13:6,10;26:2;27:11, 19;30:21;32:4;60:15;124:20; 135:17 sat (2) 144:14,17 satisfy (2) 125:17;142:2 saturated (2) 126:24;127:10 Saturday (3) 30:1,2,5 save (2) 24:8;229:24 saw (5) 63:8;158:16,21;195:18,18 saying (1) 200:6 scenarios (3) 72:15;73:21;101:20 schedule (6) 29:18;31:19;32:19,23; 227:8;229:20 scheduled (2) 10:13;29:22 science (5) 18:18,18,23;19:2;37:13 scientific (1) 108:11 scope (6) 16:22;17:9;23:1;65:6; 104:20;232:1 Scott (1)</p>
---	---	---	--

31:16 screen (3) 13:6;31:24;32:2 screens (1) 10:11 screw (1) 122:3 scroll (2) 207:23;209:1 season (15) 43:5;45:19;52:3;55:24; 56:14,17;58:19;62:10;78:13; 86:15;98:22;164:11;203:19; 223:19;227:15 seasonality (4) 63:1,3;100:1,4 seat (2) 35:15;124:15 seated (2) 35:17;37:3 second (12) 38:23;71:12;98:23; 125:18;126:19;127:4; 138:11;190:16;197:1; 204:12;208:19;233:19 secondary (1) 154:19 section (7) 37:25;121:4,4;125:8; 145:19;190:13,17 sections (1) 21:9 securing (1) 231:16 seeing (3) 124:22;184:13;230:22 seem (2) 10:5;114:25 seemed (2) 10:6;23:2 seems (4) 21:21;113:19;180:18; 189:7 seepage (4) 126:8,11;127:15;161:1 sees (1) 161:3 selected (3) 38:13;73:13;151:5 self-explanatory (1) 139:3 semi-irrigated (9) 68:12;69:2;88:22;141:14; 194:25;221:2,21;222:10,11 semi-rigid (1) 32:23 send (6) 25:5,17,24;54:22;60:11; 176:17 senior (8) 20:24;73:20,22,23;74:5; 114:16,17;115:1 sense (5)	20:21;21:2;49:20;130:11; 215:25 sensing (1) 199:24 sent (11) 13:22;54:21;87:4;126:13; 138:14;177:4,4,15,21; 178:15;217:20 sentence (10) 81:6;125:18,25;126:2; 127:23;151:2;152:17; 191:19;197:1;208:19 sentences (2) 44:1;150:22 sentinel (1) 117:6 September (8) 43:4;58:11;76:25;77:1; 78:7;217:22,25;227:11 series (12) 25:6,8,9,12;28:9;40:24; 41:10,18;124:25;182:18; 204:13;214:5 served (1) 17:17 service (5) 118:11;194:10;197:8; 199:21;202:2 services (2) 120:21;121:2 set (8) 10:3,4,7;14:20;15:1;22:25; 31:20;60:7 sets (1) 221:17 setting (1) 200:21 settlement (5) 75:15;77:22;159:15; 205:20;206:6 seven (1) 152:19 several (6) 83:19;141:12;144:16; 176:21;182:21;183:18 SF5 (2) 148:5,10 shapefile (17) 132:10;137:10;138:13,18; 139:2;140:11;142:8;178:11; 194:7,8,11,13,16,17;195:6, 11;222:7 shapefiles (12) 122:23;123:3,4,7,22,23; 124:1,9;140:6;178:3,3; 198:21 Share (15) 7:23;17:19;57:11;76:4,19; 83:22,24;84:2;86:3,7,25; 87:6;100:25;109:7;114:23 shared (2) 118:20,23 shares (4)	42:15;84:16;199:8,20 Shaw (1) 230:18 shift (9) 68:1;95:8;96:16;166:3; 171:7;181:6;188:16;196:16; 219:15 shifting (2) 79:5;166:1 short (3) 22:16;52:3;57:14 shortage (6) 42:18;53:7;57:21;114:11, 18;115:3 shortfall (23) 51:24;54:25;72:21;74:17; 76:12,20;79:6,13;86:3,5,5,8, 13,14,18;110:15;113:8; 115:19;171:20;176:10; 206:18,21;207:1 shortfalls (1) 109:7 shortly (2) 16:5;33:12 short-term (3) 98:7,10,16 shot (1) 213:6 show (10) 26:7;55:16,19;72:17; 153:25;154:8,8,12,20;221:11 showed (3) 192:12;193:19,25 showing (5) 76:25;143:16;159:9; 186:22;226:24 shown (4) 77:5;85:5;132:8,16 shows (17) 50:21;51:5;55:2,9;58:10; 74:10,16;77:6;78:3;84:25; 85:18;134:5;141:16;178:23; 186:16,25;204:9 side (19) 61:7,11,15,21;73:16; 74:23;98:24,25;99:6,8,9,10, 15,19;100:7,10,19;186:19; 187:17 signed (5) 136:13;137:8;158:12,17; 186:24 significance (1) 187:2 significantly (2) 29:6;152:21 SIGSTEDT (7) 13:17,17;30:22;179:9,20; 180:4;190:19 similar (1) 16:19 Simmons (2) 11:15,18 simple (3)	25:25;183:23;233:1 simplify (1) 24:8 simply (5) 21:13;102:1;143:14,15; 232:23 SIMPSON (9) 12:13,13;96:17,18,21,23; 102:8,13;135:7 simulate (2) 98:10,15 simulation (5) 43:15;46:7;48:18;71:16,24 simulations (5) 38:22;46:2;93:12,16;98:10 single (1) 220:24 single-season (1) 97:22 Sinks (1) 210:10 sit (1) 97:11 situation (2) 19:21;103:23 situations (1) 165:23 six (1) 30:2 sixth (2) 49:19;231:20 skinniest (1) 106:13 Skyler (1) 12:4 slated (1) 39:11 slide (29) 49:15,19;50:19,20;51:4, 15,21;52:10;54:23;55:1,8; 57:19;58:3,4,7,10;72:7,11; 73:1;74:9,10;97:3;113:25; 186:17;202:24;203:12,12, 18;215:10 slides (2) 49:24;185:7 slight (2) 31:14;160:22 small (8) 73:19,24,25;126:15; 128:20;197:24,25;231:5 smaller (2) 130:3;141:18 smallest (1) 106:13 Snake (33) 50:11,15;51:2;52:13; 73:17;74:3;78:2,4,10,23; 79:19;85:17,18,21;86:19; 90:10;93:14;94:13;100:9; 110:21;112:22;113:3;117:2, 4,14;128:6;138:15;141:13; 162:19;163:25;164:4,5;
--	---	--	---

<p>181:12 snapshot (1) 220:24 snow (7) 91:1;164:9,17,18;165:22; 167:20;168:2 soil (2) 126:23;127:9 solely (1) 202:10 solicited (1) 180:6 Somach (2) 11:15,17 Somebody (2) 27:12;211:4 somehow (1) 51:17 someone (2) 25:12;40:24 someplace (1) 127:11 sometime (4) 52:11;113:14,20;158:22 sometimes (1) 68:19 Somewhat (1) 163:9 somewhere (6) 20:17;55:15;57:22;106:2; 192:14,16 soon (5) 142:5;155:12;158:25; 159:2;160:2 Sophia (14) 13:10,17,19,23;30:22,24; 32:10;179:9;180:4;190:1,19; 191:1,5,9 Sophie (1) 179:19 Sophie's (1) 190:22 sorry (21) 31:13;46:10;47:24;59:19; 64:9;84:18;88:14,16;93:9; 94:9;101:25;139:23;145:2; 150:16;154:25;166:9; 172:18;185:20;208:4;216:5; 221:19 sort (3) 77:21;129:11;147:3 sound (1) 38:25 sounds (3) 74:13;174:11;227:22 source (11) 69:25;70:4,4,19;81:9; 127:22,22;138:13;144:23; 164:2;208:13 sources (5) 62:22;68:13,14,16,21 south (10) 61:7,21;98:24,25;99:8,9,</p>	<p>10,19;100:7,10 southeast (1) 163:23 space (1) 169:1 Spackman (3) 11:4;45:23;137:8 speak (6) 12:20;13:8;15:6;105:25; 111:11;184:10 speaking (7) 14:5,13;74:1;80:4;162:22; 187:7,15 specialty (1) 118:12 specific (11) 23:15;79:25;80:3;90:16; 93:24;94:23;109:5;160:16; 183:9;210:23;221:23 specifically (18) 20:10;26:25;33:6;45:12; 79:14;89:10;91:21;108:9; 129:8;141:4;153:1;154:11, 14,15;160:19;171:19;188:8; 231:11 specifics (1) 17:7 speculate (1) 111:19 speed (1) 29:6 spell (3) 37:8;106:17;120:2 spelled (1) 106:19 SPF (3) 133:2;134:5;192:8 spillover (1) 30:1 split (2) 87:2,5 spot (2) 136:20;152:2 spreadsheet (3) 62:12,21;76:24 spring (2) 128:6;171:8 Springs (3) 20:13,15;92:5 Spronk (3) 12:2;179:15;180:1 SRBA (7) 147:2,11,15,19;148:4,5; 200:24 stabilize (2) 225:17,17 staff (31) 24:6;33:7;66:23;68:10; 81:16,22;88:12,20;92:16,20; 94:22;111:8;121:3;158:25; 169:12,18;172:24;173:4; 180:7;183:10,14;185:15; 205:6;212:13;220:19,21,23;</p>	<p>221:4;223:17,20;225:25 staffing (5) 223:13,24;225:19;228:2,5 stage (1) 16:15 stake (1) 233:24 stamped (1) 40:20 stand (4) 106:1;138:12;140:2; 144:12 standard (14) 142:2;143:22;154:22; 155:4,15,16;156:2,23,25; 157:6,12;166:1,4;200:4 standards (1) 200:1 standing (5) 17:8;21:19;35:15;213:1; 234:23 standpoint (1) 47:19 stands (1) 138:16 start (19) 10:18;11:8;13:5;30:9; 41:21;105:22;124:23; 125:22;135:24;196:14; 198:24;225:23;227:6;234:9; 235:21,22,22,23;236:3 started (14) 44:2,4;52:23;108:8;114:4, 7;136:24;169:20,25;170:15; 176:12;188:3,6;226:15 starting (5) 27:25;48:19;58:17;86:12; 125:7 starts (1) 150:23 state (78) 17:23,23,24;37:7,14; 38:21,22;43:20;44:5,6,9,12, 17,21;45:10,15;46:3;48:7,11, 16,18;50:21,23;52:13,18; 55:4,11,24;56:20;57:20; 71:2,3,6,10,18,21,21;72:8,13, 14,19,21;74:24,25;75:5,22; 85:22;95:15;96:10;97:15,22; 98:6,10,17;106:17;108:14, 18;109:6,8,11;111:1,5,9,17; 112:21;113:2,16;120:2,9; 145:15;147:7;205:19,19; 207:9,9;210:22;231:17; 232:10 stated (7) 21:16;22:4;110:25;111:4; 131:14;151:21;190:25 statement (3) 125:12,13;208:10 statements (3) 17:15;20:6;21:17 states (2)</p>	<p>51:6;191:20 stating (3) 108:9;232:23,25 statistic (2) 187:4;225:11 status (3) 172:8;217:23,23 stay (1) 127:1 stays (1) 130:4 steady (50) 17:23;38:21;43:20;44:5,9, 12,17,21;45:10,15;46:2;48:6, 11,16,18;50:21,23;52:13,18; 55:4,11;57:20;71:2,21;72:8, 13,21;74:25;95:14;96:9; 97:14,22;98:6,9,17;108:14, 18;109:5,8,11;111:1,4,9,17; 112:21;113:2,16;205:19; 207:9;232:10 Stegner (1) 232:21 step (7) 47:18;60:19;118:3,6; 178:8;185:13;201:17 stepping (1) 185:23 steps (6) 46:25;47:4;48:21;107:24; 117:25;118:1 stick (2) 55:8;140:2 still (14) 97:11;137:9;150:7; 153:17;155:14;171:14; 173:9;182:5;189:22;223:22; 224:9,11,15;225:3 stipulate (5) 29:5,11;35:21;36:10,14 stipulated (4) 29:2;36:9,11;101:24 stipulating (1) 28:22 stipulation (5) 29:16;36:1,2,4;147:17 stool (1) 96:17 stop (1) 141:5 storage (6) 17:25;86:4,7;213:25; 214:15,22 straight (1) 25:22 stream (1) 92:3 streamlined (1) 232:17 streams (3) 91:9;163:4,24 street (1) 18:13</p>
---	--	--	--

<p>stress (4) 46:25;47:4,18;48:20</p> <p>strike (3) 81:13;201:16;209:14</p> <p>studies (2) 156:11,12</p> <p>study (2) 155:19;156:17</p> <p>stuff (1) 147:16</p> <p>sub (1) 160:9</p> <p>subdivision (2) 69:5;195:2</p> <p>subject (5) 17:2;74:7;84:15;101:23; 102:4</p> <p>subjects (2) 29:13;109:23</p> <p>submit (3) 118:21;183:1;233:2</p> <p>submitted (8) 25:22;76:7;138:20; 179:10;194:8;197:5;220:7, 11</p> <p>subpoena (2) 15:20;31:9</p> <p>subpoenas (2) 15:24;16:4</p> <p>subsequent (3) 19:20;172:19;175:11</p> <p>substitute (1) 40:21</p> <p>subtract (3) 61:10;62:19;193:4</p> <p>successful (1) 18:9</p> <p>sudden (1) 235:17</p> <p>sufficient (2) 142:2;148:23</p> <p>suggest (1) 27:25</p> <p>suggested (2) 191:5;223:14</p> <p>suggesting (1) 223:2</p> <p>suggestion (3) 34:10;105:22;223:6</p> <p>suggestions (4) 131:6;218:6,19;219:1</p> <p>suited (1) 211:12</p> <p>SUKOW (33) 12:21,21;27:25;31:8; 36:22,24;37:4,7,9;56:21; 57:2;63:12;83:11;88:2,5,15; 95:7;96:22;102:25;104:9,21; 105:9,14,16;109:6;111:22; 112:4;128:10;141:21;159:7; 169:18;200:8;226:22</p> <p>S-u-k-o-w (1) 37:9</p>	<p>Sukow's (2) 27:9;194:20</p> <p>SULLIVAN (7) 12:1,1;30:23,24;32:8; 131:2;179:13</p> <p>summarize (2) 181:19;209:5</p> <p>summary (10) 26:8,15;65:24;66:16; 108:6,8;134:3;177:7;180:3; 232:23</p> <p>summer (3) 159:21;169:23;170:15</p> <p>superposition (1) 108:20</p> <p>supervising (2) 169:22,22</p> <p>supplemental (13) 157:7;196:23;197:2,7,11; 198:22;199:19;201:16,19, 21;202:3,7,14</p> <p>supplied (4) 43:7;70:5,6,10</p> <p>supplies (2) 58:12;214:9</p> <p>Supply (49) 7:14,19;28:10;40:25;42:6; 43:7;57:6,8,20;58:23;70:2,3, 19;74:6;75:3;92:1;93:15,20; 94:5,7,11;110:14;122:1; 161:23;162:10;165:7,12,14, 15;166:2,3,13;167:3,4; 168:24;170:23;171:5;177:6; 181:7,10,21;184:22;187:14; 188:8;190:14,21;191:10; 198:13;225:4</p> <p>supplying (1) 171:17</p> <p>support (5) 75:14;81:9;98:5;208:13; 231:23</p> <p>suppose (1) 34:20</p> <p>Supreme (2) 19:12;21:12</p> <p>sure (37) 10:4,10;13:9;14:16;36:10; 50:4;71:4;90:23;92:22; 93:22;95:2;101:4;113:21; 114:25;124:5;129:5,13; 133:14;143:11;144:16; 147:9;151:4,12;153:9,9; 157:12;166:24;178:18; 181:18;182:12;184:3; 188:10;195:15;196:3; 206:10;220:22;233:20</p> <p>Surface (86) 10:15;33:11,19;34:22; 38:24;48:14;49:2,11;53:7, 13;61:20;66:3,19;70:2,5,10, 17,23;80:16;81:8;82:3; 85:23;91:3,8,9,11;96:16; 98:11;100:15,19;102:11;</p>	<p>106:12;109:11;110:15; 114:11;115:19;116:18; 122:1;125:15;127:8;133:22; 137:21;138:2,14,20;140:7, 11;149:6;159:16;165:7; 168:16;181:13;197:14,17; 198:23;199:8,15,17;201:1, 19,24;202:2,4,9,10,15,16; 203:4,15;205:20;208:12; 209:20;210:21;211:25; 213:23;214:8;216:20,25; 217:15,18;219:15;220:8; 228:22;230:14;231:18;233:7</p> <p>surprised (1) 233:10</p> <p>suspense (1) 136:19</p> <p>sustain (1) 105:6</p> <p>Sustained (3) 103:11;159:25;206:11</p> <p>Swan (4) 144:12;145:1,4,8</p> <p>SWC (11) 7:15;133:23,23;138:5,10, 11;187:16;197:8;203:13,20; 215:9</p> <p>switch (6) 32:8;53:10;130:16;136:3; 137:14;216:12</p> <p>switched (1) 158:20</p> <p>switching (2) 32:11;224:4</p> <p>sworn (3) 36:25;106:7;119:19</p> <p>system (9) 62:23;99:6,14;105:25; 127:13,18,19,24;199:9</p> <p>systems (2) 199:7;209:21</p>	<p>26:25;125:23;135:24; 153:24;155:20,23;157:14; 170:15,16;172:15;173:8,9, 10;175:7;199:11,24;201:12; 210:11;213:22,25;214:18; 215:1;225:21;228:5;231:10</p> <p>talks (5) 50:20;77:23;186:17; 231:12,14</p> <p>target (4) 61:16;62:3;89:21;100:6</p> <p>targets (1) 90:22</p> <p>tasked (3) 183:10,14,16</p> <p>team (1) 106:24</p> <p>technical (99) 37:24;44:15,16,18,19,24; 45:3;49:11;53:12,17,20,24; 54:2,16,21;63:21,25;65:25; 66:16;67:8;72:4,18;94:7,16, 19,21;95:3,18,20;107:18; 111:9;117:6,16;120:21; 121:1;122:16;130:12,19; 131:8,14,15,17,23;133:24; 143:12;144:13;145:5;149:6; 157:25;158:24;169:12; 170:18;172:24;174:13,16,19, 24;175:2,12,18,22,23;176:4; 177:9,12,22,25;178:22; 179:10;180:2,7;182:10,18, 22,24;185:4;196:2;197:9; 209:9,16;212:13;214:6; 215:2;216:19;217:2,4,6,7,24; 218:3,7,12,14,15,20,23,25; 219:1;230:16</p> <p>technically (3) 44:1;200:6,22</p> <p>technology (5) 37:12;179:10,20;180:5; 190:18</p> <p>telling (4) 87:5;101:14;225:10; 234:19</p> <p>temperatures (3) 151:6,15,18</p> <p>Temple (1) 32:15</p> <p>ten (7) 31:21;32:16;48:9;56:3; 87:23;109:3;143:5</p> <p>tend (1) 226:22</p> <p>tender (1) 109:22</p> <p>ten-fold (3) 21:3,4,5</p> <p>term (8) 69:24;82:15;127:21; 143:3;146:12;155:8;187:3; 212:9</p> <p>terms (10)</p>
T			
	<p>tab (1) 125:2</p> <p>table (25) 14:22,24,25;18:12;20:4; 35:15;74:23;84:24;85:3,6, 20;132:8,16;134:2,5;136:24; 138:1,4;139:8,13;186:15,21; 195:19;204:9,19</p> <p>Taggart (1) 12:5</p> <p>talk (12) 15:17;23:13;29:13;33:2; 35:9;129:9;138:9;154:21; 157:16;199:4;211:15;235:6</p> <p>talked (9) 88:8;129:7;132:22;144:8, 16;181:7;182:20;217:19; 222:1</p> <p>talking (25)</p>		

64:6;79:12;91:15;97:13; 169:16;191:24;198:3; 209:25;215:20;228:2 testified (17) 37:1;89:16;97:2,19;99:4, 11;101:22;106:8;119:20; 128:10;132:14;141:21,25; 144:19;187:22;188:3;221:10 testifies (1) 35:5 testify (14) 15:21;21:22;30:7,13;33:9; 35:24;36:3;38:18;121:20; 128:12;161:22;174:22; 180:20;210:19 testifying (2) 222:22;224:5 TESTIMONY (20) 7:2;13:25;16:1,6,19;22:8; 28:2;31:21;35:8;88:7;92:2; 99:1;101:2;104:3,20;105:8; 194:20;216:18;225:12;233:4 testing (1) 227:7 Teton (1) 211:10 Thanks (6) 35:25;186:7;228:17; 234:7;235:19;236:4 Theoretically (3) 200:13,16;201:3 thereby (1) 19:23 thinking (1) 105:2 Third (7) 71:10;127:12;140:25,25; 169:9;171:6;184:11 Thompson (41) 7:4;11:10,10;16:16,16; 19:24;21:19;28:20,21,25; 29:8;32:14;40:4,7,19;96:24; 106:9,11,16;107:2;109:15, 22,25;112:25;119:8,9;129:1; 146:2,24;168:18;210:20; 219:18,20,21,24;222:12; 229:4,17;230:9,12;233:8 though (7) 48:19;79:8;91:25;118:24; 144:7;160:14;234:10 thought (7) 63:8;136:1;141:9;149:13; 150:13;159:21;234:18 thoughts (2) 17:20;34:9 three (10) 12:18;69:1;120:19; 139:12;183:9;189:18,19; 194:23;204:17;221:19 three-quarters (1) 147:16 threshold (1) 143:13	thumb (1) 49:18 Thursday (1) 30:15 thwart (1) 22:14 timeliness (1) 156:1 timely (4) 155:6,6,8,13 times (2) 56:3;144:16 timing (6) 15:25;33:9;105:15; 108:18;144:21;159:12 title (12) 51:18,22;58:7;63:17; 65:18;66:11,14;73:5;116:11; 133:19;184:19;215:9 titled (9) 49:2;73:1;133:20;137:20; 138:2,11;140:16;173:25; 203:2 TJ (9) 12:9;17:13;19:9;35:18; 36:18;63:12;135:2;166:22; 215:1 today (19) 15:11,15;20:4;33:18; 34:14;36:4;38:14,18;39:3; 97:11;101:22;121:17; 122:20;166:23;173:13; 178:21;189:23;200:22;228:8 together (1) 204:17 told (10) 45:14,21;53:16,18,19; 64:21,25;65:3,3;200:20 tomorrow (6) 147:10;229:16;234:9; 235:13,18;236:4 Tony (4) 15:20,25;91:18;211:12 took (3) 45:6;169:15,19 tool (3) 108:11;182:3,4 tools (1) 227:22 top (9) 126:4;127:5,23;129:10; 150:25;185:10;186:17; 190:9;210:16 topic (3) 38:18,20;211:8 topics (5) 39:3;121:20;122:20; 125:9;182:21 total (10) 62:6;69:14;76:19;100:12; 101:12;120:18;125:14,16; 192:13;204:18 totaling (1)	85:15 totally (1) 220:22 touch (1) 158:7 town (1) 232:19 track (1) 197:17 tracking (4) 117:7;154:14,15;201:1 traditional (2) 18:20;35:4 transfers (1) 117:3 transient (65) 17:22,23,24;38:21;43:14, 15;44:5,10,13,18,23;45:11, 15,25;46:3,5,7;47:19,23; 48:2,3,6,11,22;55:3,24; 57:25;71:3,6,9,16,18,21,24; 72:8,14,19;74:16,24;75:5,22; 76:24;78:6,16;85:22;87:12; 95:15,22;96:10;97:15; 101:21;108:20,25;109:2; 110:19;111:10,14;158:4,11, 20,23;159:6,10;205:19; 207:9 transition (1) 17:22 translates (1) 207:2 transmissivity (1) 90:15 traveling (4) 17:18;232:19;235:13,18 Travis (5) 11:9,10;14:14;16:16; 219:21 trend (1) 224:13 trends (1) 62:14 tributaries (1) 100:9 tributary (8) 91:9;92:1,3;163:4,24; 164:5;165:23;168:23 tried (1) 24:6 trimline (14) 82:13,21,23;103:6,9,15,17, 23;104:10,12,13;105:8; 212:4,5 trimlines (3) 83:4,6;212:14 true (18) 43:8,14;46:1,12;47:1,10; 48:17;50:25;58:16;61:12; 86:24;130:3;179:21;180:3; 193:17;221:12,13,16 truth (3) 36:25;106:7;119:19	try (13) 23:21;24:8;25:24;29:9; 30:3;33:25;63:13;88:18; 90:13;122:2;131:21;169:6; 199:5 trying (10) 22:7,25;32:20;60:11; 151:20,25;152:1;155:15; 214:8;223:20 Tschohl (3) 26:2;27:11;32:4 turn (35) 38:4;58:3;65:10;67:6; 72:6;76:2;80:13;83:7;84:8; 97:1;116:9;121:5;125:6; 132:3;134:1;135:15,16; 162:3;173:18,19;179:6; 182:7;184:16;185:8;189:21; 190:4;191:13,16;196:5,17, 19;202:19;207:16;213:15; 219:24 turning (1) 124:15 twice (1) 40:9 Twin (85) 42:19;43:1,6,13;54:25; 55:10,23;56:16;57:14;58:12; 60:24;61:7;62:7,15,22; 73:16;89:18;99:14;100:8; 122:13;128:4,13,17,23; 132:9,10,15,24;136:17; 137:10;140:9;141:4,15; 143:15;144:2,6,17,20;145:1, 10,15,17,24;146:13,16; 147:14,17;164:3,6;165:12, 16;168:22;171:19;178:13, 20;181:8,11,17,20;183:12; 184:9;186:19;187:19,23; 189:7,10,15;190:21;191:10; 192:11;193:19,20;194:1,6; 201:6,10;222:2,8,23;223:3,7; 224:5,10,12;225:2 two (19) 16:4;17:9;34:21,23;38:17, 20;65:12;73:4;76:12;113:13; 123:13;124:22;141:16; 150:22;194:13;199:2; 204:15;216:19;234:2 two-thousand- (1) 182:17 type (14) 64:21;65:1;80:9;116:25; 118:15;148:6;152:23;154:7; 160:16;172:3;176:15;193:6, 7;199:24 types (2) 81:18;141:12 typically (2) 69:4;148:7 typo (1) 202:24
---	--	--	---

<p style="text-align: center;">U</p> <p>Ultimately (2) 174:1;176:23</p> <p>unavailability (1) 31:7</p> <p>unclear (1) 155:19</p> <p>under (29) 22:15,18;72:13,14,21; 74:24;86:17;87:10;100:25; 101:18;115:17;135:18; 140:6;145:24;178:8;190:13; 191:18;203:20;204:2;205:4; 207:10,11;208:21;209:7; 227:23;233:16;234:8;235:1, 3</p> <p>underlying (2) 22:2;67:11</p> <p>underneath (1) 190:17</p> <p>understood (14) 21:18;45:25;48:5,9;64:25; 104:22;152:15;153:20; 167:3;176:25;194:20;207:8; 218:18;226:21</p> <p>undertook (1) 182:1</p> <p>unduly (2) 114:15,25</p> <p>unique (1) 24:7</p> <p>uniquely (1) 25:2</p> <p>unit (2) 68:17;88:21</p> <p>units (1) 88:13</p> <p>University (3) 37:12,14;120:9</p> <p>unless (2) 13:20;29:14</p> <p>unlined (1) 126:15</p> <p>unqualified (2) 39:3;122:20</p> <p>unregulated (7) 94:8,13;162:11,25;165:6; 167:11;181:22</p> <p>unsure (4) 167:18;171:8;188:17,18</p> <p>up (54) 10:3,4,7;12:20;14:20;15:1, 6,7;23:11;28:3;29:6;33:1; 60:19;63:8;81:15,21;82:22; 83:19;84:19;87:2,5,11; 96:17;100:24;105:25;106:1; 122:3;124:25;127:23;130:1; 152:2;153:25;154:8,9,12,20; 160:1;166:25;177:5;192:21; 193:13,14;202:23;204:18; 206:2;207:9;209:9;212:9;</p>	<p>218:20;221:11;225:18; 227:10;229:25;235:20</p> <p>update (2) 153:7;225:25</p> <p>updated (6) 25:24;46:24;138:25; 176:14;201:2;228:6</p> <p>updates (1) 214:7</p> <p>updating (2) 20:3;201:12</p> <p>upper (1) 204:19</p> <p>upstream (1) 91:5</p> <p>use (79) 20:18;21:13;25:23;28:2,5; 40:9;41:1;60:23;63:3;68:17, 18,18;69:17;70:22;73:19; 81:10;85:16;87:20;88:11,20; 89:24;90:1,12,24;91:16; 108:14;109:9;111:16; 126:13;129:16,17,17; 131:20;134:14,17;137:22; 138:17,22;141:11,12;142:8, 12;143:2,3,14,19;155:8; 160:20;196:23;197:11; 198:21,22;199:19;200:11,15, 16;201:3;202:7,14;203:4; 204:13,21;206:23;208:14; 209:6;210:11,17;211:19,24; 215:20;218:21;223:2,7,9; 225:13;231:16,17;234:1,22</p> <p>used (60) 24:4;43:13;48:16,18; 60:25;61:1,2,25;63:22;68:3; 69:9,10,12,13,18;70:14,15, 17,18;71:5;82:13;89:1,3,4,5, 7,9,20,22;90:22;123:7,11; 132:9;134:9,11,12;136:17; 140:23;141:3,19,22;149:13; 155:9;157:10;171:5,17; 179:2;181:8;184:1;192:25; 193:1;201:23;202:4,13; 212:4,8;218:10;219:2; 223:21,25</p> <p>user (3) 209:25;210:1,2</p> <p>users (25) 16:7,12;18:8;33:24;34:15, 21;36:15;39:8;42:23;49:4; 58:17,21;79:6;95:7;96:16; 110:14;124:14;159:17; 165:17;187:5;199:5,11,24; 223:2,15</p> <p>uses (4) 47:3;89:15;110:13;130:23</p> <p>USGS (1) 171:7</p> <p>using (31) 26:21;46:24;55:3,11;57:9; 62:8;68:9,12;72:8;83:17; 111:14;130:8;131:4,6;</p>	<p>135:23;137:9;140:4;141:17; 142:11,13,21;143:4;171:9; 186:18;195:22;199:6; 200:10;204:10;222:9,23; 227:24</p> <p>usually (1) 194:25</p> <p>Utah (2) 37:14;120:8</p> <p>utilize (3) 68:14;98:17;198:20</p> <p>utilized (8) 63:19;71:17;101:6,10; 181:20;192:22;203:14; 210:14</p> <p>utilizing (1) 231:1</p> <p style="text-align: center;">V</p> <p>vague (1) 67:22</p> <p>Valley (1) 79:20</p> <p>valuable (1) 20:20</p> <p>value (6) 171:23;186:23;187:3,9,18; 224:14</p> <p>values (3) 133:6;187:9,10</p> <p>variability (1) 187:6</p> <p>variable (4) 181:15,24;189:5,12</p> <p>variables (4) 129:12;171:5;177:5; 189:19</p> <p>variety (1) 68:12</p> <p>various (5) 93:17;109:3;117:7; 233:15;234:23</p> <p>vastly (1) 201:9</p> <p>vegetation (1) 126:16</p> <p>verbal (2) 15:4;176:20</p> <p>vernacular (1) 11:2</p> <p>versa (1) 221:14</p> <p>version (18) 46:8,11,16,17,24;47:3,12, 14,15,17,21,21;54:20;70:12; 71:15;99:20;108:9;139:1</p> <p>versions (2) 46:6;169:8</p> <p>versus (11) 19:12;38:21;48:6,11;55:4; 61:6;72:14;74:25;91:1; 173:16;226:22</p>	<p>via (2) 54:10,16</p> <p>vice (1) 221:14</p> <p>view (3) 10:5;19:19;195:4</p> <p>violation (1) 104:19</p> <p>vocal (1) 15:21</p> <p>voice (1) 15:7</p> <p>volume (9) 53:3;58:20;62:12;98:14; 99:23;125:16;133:10;135:2; 162:12</p> <p>volumes (2) 81:8;208:12</p> <p>volumetric (1) 125:15</p> <p style="text-align: center;">W</p> <p>wait (3) 139:12;147:24;185:20</p> <p>walk (2) 129:11;160:7</p> <p>walking (1) 117:24</p> <p>wants (3) 213:5;232:8;233:7</p> <p>warning (1) 234:24</p> <p>waste (1) 20:19</p> <p>wasteful (1) 231:17</p> <p>watch (1) 171:20</p> <p>watching (5) 153:16,17;154:17;171:10; 189:17</p> <p>Water (348) 10:15;11:2,5,25;12:2,6,8, 10,12,15,18,22,24;13:2;16:7, 12;17:14;18:8;20:12,18,24; 22:15;33:11,19,24;34:15,21, 22;36:15;37:19;38:24;39:8; 42:11,23,25;43:6,12;45:19; 47:8;48:14;49:2,4,11;50:14; 52:2;53:7,13;55:23;56:13, 16;57:10;58:9,17,18,21,23; 62:22;63:13,15;66:3,19; 68:24;69:23,25;70:2,2,6,6, 10,11,17,18,23,23;73:2,19, 22,23;74:2,6;75:3,6,7,16,22; 77:7,22;78:2,3,4,10,11,17; 79:4,19,20,20,21,24;80:1,3, 16;81:8,8,10,12;82:3;83:20, 22;84:3,25;85:11,17,20,23; 86:4,7,18,19,21,22;89:3,17; 91:2,13,17,23;92:1;93:7,12, 13,15,20,23;94:11;95:7;</p>
--	---	--	---

96:16,16;98:11,19;99:5,13, 21;101:8,11,15;102:3,11; 106:12,22,24;107:25;108:13, 23;109:4,11,12;110:13,14, 15;114:11;115:9,19;116:18; 118:13;120:14;122:1,2; 124:14;125:15,15,17;126:12, 14,18,24;127:3,8,10,18,19, 20,20,22;129:14,16,19,21, 22;130:4;131:10;133:22; 137:21;138:2,14,20;140:7, 11;145:16,18,24,25;146:4; 147:1,6,12;149:6;151:9,24; 153:3,6,14,15,24;154:1,2,3; 155:1;157:7;159:16,17; 160:19;164:2,9;165:7,7,11, 12,14,15,17;168:2,16,24; 179:15;180:1;181:13;192:8; 193:3,10,16;196:23;197:2, 11,14,14,17,18,20,21,25; 198:7,11,11,13,16,21,22,23, 25;199:5,6,7,8,9,15,17,17,19, 22;200:25;201:1,1,19,19,22, 23,24;202:2,2,4,4,7,9,10,12, 14,15,16;203:4,15;204:3,5,6, 13,16,21,23;205:3,11,21; 207:4;208:12,12,14,21; 209:6,20,25;210:1,1,1,5,8,9, 21;211:4,14,20,25;212:22; 213:23;214:8,9,12,15; 216:21,25;217:15,18;219:13, 16;220:8;223:2,15;224:20; 228:20,22;230:14;231:13,16, 17,18,19;233:7,16;234:16, 22;235:1	45:7;96:5 weighing (1) 233:22 weight (1) 232:7 Welcome (2) 10:1;124:17 wells (17) 50:10,11,14;52:11,23; 53:6;111:22,25;112:24; 113:4,14,23;114:3,10,16,17; 115:1 weren't (5) 73:20;94:15;101:19; 137:5;209:15 what's (15) 20:24;32:21;61:25;90:9; 104:17;107:3;110:2;116:11; 125:21;141:19;148:18; 174:10;212:6;229:8;235:23 whole (1) 157:15 Who's (4) 60:9;144:5;168:25;169:1 wide (1) 75:1 widely (1) 108:10 Wildman (3) 143:20,23;157:13 Wildman's (1) 17:3 Willow (4) 92:11;163:7,18;165:1 wind (1) 11:9 windfall (2) 168:15,21 winter (3) 167:20;170:20;214:5 wisely (1) 231:1 wish (3) 16:14;23:11;219:16 withdraw (1) 50:14 within (33) 16:9;58:22;69:13;70:4; 75:2,2;77:7;85:21;89:9; 93:14,19;98:22;117:10; 118:10;125:15;160:20; 165:4;176:19;197:8;198:12, 22;201:18,24;202:2,9,16; 205:6;210:18;211:24;216:1, 4;232:8;234:4 without (8) 28:6;35:22;50:10;53:5; 111:23;152:5;199:11,23 witness (49) 13:16;14:21;15:2;29:18; 31:16;32:8,19;33:12,14; 34:2,11,16;35:4,13,16;38:14; 39:14,18;41:17;56:22;81:3;	87:20;88:16,19;106:4; 107:12;110:5;119:12,13,15; 121:17;129:5;133:12;135:5, 9;136:9;139:22;148:15; 150:19;155:8;161:10; 166:16;168:21;209:4;211:4; 212:20;222:14;228:18,25 witnesses (19) 15:21;16:18;21:20,21; 23:4;29:20;30:2,6,7,13;33:5, 8,21;34:21;35:3,7,22;36:9; 229:21 WMIS (5) 197:16;198:1,5,18,25 wonder (1) 211:2 Wood (32) 7:5;11:6,6;34:14;35:11; 37:4,6;39:5,7,16;103:1,2,4, 12,14;104:8;105:6,11,12; 119:21,24;123:25;124:4,10, 11;133:11;161:20;208:2; 222:18,19,21;224:18 words (4) 43:25;52:22;113:22; 132:19 work (36) 60:11;63:18,20,23;64:17; 66:24;67:13,16,20,21;68:20; 75:12;77:12;78:20;82:22; 101:18;102:1;106:21,22; 107:10;116:25;117:6;130:5, 19;131:17;144:13;170:20; 175:12;177:22;178:1,4; 185:25;191:5;209:9;212:10; 225:21 windfall (2) 37:21;120:16,18,19; 166:11,12;169:7,9;170:8; 175:17;178:4 working (70) 44:19;49:12;53:13,17,21, 24;54:2,16,21;63:21,25; 67:8;72:4,18;95:3,19,20; 107:19;116:17,21;117:17; 122:16;131:8,14;132:2; 133:24;142:15;144:13; 145:5;149:7;157:25;170:12, 18;174:13,16;175:18,22,23; 176:5;177:9,12,25;178:22; 179:11;180:2,7;182:19; 185:4;189:6,7;196:3;201:11; 203:9;215:2;216:20;217:2,4, 6,8,24;218:3,7,12,15,20,23, 25;219:1;226:11;230:16 works (4) 92:24;129:12;189:12; 211:13 world (2) 142:25;143:3 Wow (1) 23:12 wrap (1)	160:1 write (2) 43:23,24 writing (3) 21:25;22:10;42:10 wrong (2) 139:9,10 wrote (1) 182:22 Wylie (1) 44:8
Y			
			year (50) 44:23;52:19;54:24;55:21; 58:17;59:6;110:22;122:1; 128:25;137:4;138:21; 142:23;143:1;144:20; 146:16;150:23;151:4,5,6,14, 22;152:20;153:7,11,17,21, 22;167:16;168:3,8;170:22; 171:14;176:1,6;178:17; 206:16,23;210:9;220:24; 221:3,11,15;222:4;223:17, 21,22;224:2;226:5,13,16 years (26) 37:23;38:3;43:19;44:3,22; 48:9;50:16;53:2;79:2,2; 109:3;111:10;112:1;120:18; 130:13;143:5;151:5,6; 152:19;153:17;171:11; 224:17;226:14;227:14,18,21 year's (2) 86:5;107:24 yellow (2) 52:16,17 Yep (14) 46:11;121:12;133:16; 179:8,18,21;182:15;185:2, 10;186:11;190:11;192:10; 203:17;215:11 yesterday (1) 16:17 yield (2) 90:16;213:5
Z			
			zeros (1) 70:9 zip (1) 123:13 zone (1) 126:25 Zoom (2) 54:10;124:22
0			
			0.06 (1) 78:7 01 (1)

91:24	15,924 (4) 204:10,19;205:8;215:24	1st (4) 58:17;137:24;162:12; 203:6	2021 (13) 46:15,17;48:20;156:4; 169:24;170:4,11,21;193:24; 195:17;196:2;224:2;226:11
1	150,000 (1) 57:22	2	2022 (27) 7:18;40:25;41:9;49:8; 52:3;53:11;57:5;66:4;123:3; 130:20;137:24;156:5; 170:14;172:8;177:23; 184:23;185:5;187:1;188:2; 203:6,19;216:22;217:7; 218:4,7;224:2;227:10
1 (17) 7:22;43:4;51:24;58:8; 73:2;76:4;91:17;107:24; 108:9;118:3;129:21,22; 135:2;178:8;183:11;211:14; 214:13	162,000 (2) 57:15,20 162,600 (1) 57:17 16th (1) 179:11	2 (10) 11:14;43:18;47:25;108:5, 14;133:10;135:3;190:10,13, 17	2023 (31) 7:13;38:16;42:5;45:11,16; 47:7;48:5;52:1,25;53:8;76:5, 12;79:13,22;80:6;83:9; 86:15;111:14;113:8;114:5, 12,18;115:3;122:16;123:4,7; 124:1,8;178:3,6,7
1,175 (1) 204:18	170,000 (1) 57:22	2.1 (4) 47:15,17,21,25	20221223 (1) 7:20
1:00 (2) 105:18,19	178 (1) 165:1	2.2 (4) 46:12;47:17,21;108:10	2023 (31) 7:13;38:16;42:5;45:11,16; 47:7;48:5;52:1,25;53:8;76:5, 12;79:13,22;80:6;83:9; 86:15;111:14;113:8;114:5, 12,18;115:3;122:16;123:4,7; 124:1,8;178:3,6,7
10 (4) 132:3;135:3;196:19,20	179 (3) 148:5;192:16;222:6	20 (4) 72:6;74:22;82:7;207:24	21 (2) 97:4;98:6
10:30 (1) 60:5	179,000 (3) 178:24;193:25;222:3	20.03 (6) 80:23;81:1,6;207:25; 208:8,10	216 (2) 7:3;164:19
100 (2) 24:20,22	179,486 (1) 140:13	20.04 (5) 81:1,20;207:25;208:8,18	217,000 (1) 78:5
103 (9) 182:6,8,10;185:14,19,20; 186:2,4,5	17th (1) 184:23	2008 (3) 17:2;19:25;217:16	219 (1) 7:4
10th (1) 30:2	18 (6) 120:18;162:3,5;213:17,18, 20	2009 (2) 192:8;217:16	22 (12) 50:6,7;57:8;97:4;98:6; 132:9;139:18;170:5,5; 203:13,17;215:6
11 (2) 58:9;73:3	180 (1) 192:16	2010 (2) 134:14;138:22	222 (1) 7:5
11/28/2022 (1) 7:15	180,000 (2) 178:24;192:12	2011 (11) 139:6,16;140:4,5,13,20; 141:17;192:6;195:22;196:4; 220:17	22-23 (1) 214:5
11:30 (1) 87:23	180,956 (1) 193:20	2012 (2) 46:21;147:13	224 (1) 7:6
111 (1) 204:18	183 (1) 192:16	2013 (18) 46:22,23;47:13;48:9,13, 19;132:10;134:6,7,9,11; 137:9;143:14;178:14;194:6, 15;195:6,11	23 (3) 66:4;178:14;196:21
1-14 (3) 203:23;204:2,5	183,000 (1) 133:1	2014 (7) 134:14,15;166:7;183:17; 186:23;188:2,15	23rd (4) 174:9;175:4;177:2,19
1175.2 (1) 204:16	183,589 (1) 134:6	2015 (23) 117:16;133:14,25;134:12, 17,19;141:1;142:10;171:7; 182:10,18;184:11;185:14; 186:24,24;188:15;190:20; 191:2,6;216:21;217:6; 218:25;219:1	28 (3) 49:8;152:8,11
118 (8) 219:23,25;220:2;230:10, 13,21,23,24	186 (1) 164:23	2016 (4) 137:9,9;171:3;187:1	29 (2) 125:7,13
11th (3) 58:22;73:13;74:11	19 (5) 133:24;138:1;139:19,20; 191:18	2017 (22) 140:17,21;141:17;142:5, 12;143:8;155:20,25;156:7, 15;192:6,20;193:18;194:19; 195:4,4,8,14;220:17;222:2; 226:7;228:9	2nd (1) 145:16
12 (2) 125:7;152:9	1900 (9) 58:9,11,22;73:3,13,24; 74:1,11;78:4	2018 (4) 116:24;176:6;187:1;226:9	3 (11) 107:1,3,5,22,25;108:20; 109:16,20,21;110:18;134:2
126 (6) 84:7,9,11,12,14,19	1903 (1) 145:16	2019 (1) 116:22	3,262 (2) 85:19,23
13 (15) 38:3;44:3,22;51:15,21; 52:8;54:23;55:2;57:19; 113:12;126:3;127:5,24; 129:10;160:6	194 (1) 179:2	2020 (8) 169:25;170:1,2,10,20; 171:12;187:1;188:4	3:40 (1) 196:12
13,000 (1) 141:18	194,000 (3) 137:10;193:22;194:5		30 (6) 50:16;112:1;160:5,8,17; 233:19
135 (5) 134:25;135:6,9,11,23	194,727 (1) 140:12		300 (39)
135/306 (1) 135:1	1953 (3) 42:20,24;85:21		
14,637 (6) 203:23;204:3,6,18;205:7, 14	197 (3) 7:22;76:1,3		
15 (9) 37:23;58:3,4;72:25;97:21; 120:20;166:7;196:12;214:4	199 (2) 24:21,22 1990s (1) 50:12 1994 (1) 205:2		

<p>7:10;25:6,9;26:22,24; 39:15,16,17,25;40:1,3;41:18, 22;42:8,10;43:17;44:14; 59:4,17,20,21,24;124:25; 125:1,2,3,7;132:4,9;150:7, 11,13,19;160:3;162:1; 191:13;196:17;213:14; 231:10 300,000 (2) 62:9;128:24 301 (21) 7:12;26:22,24;42:1,3,9,13; 52:1;59:4,9,13,17,17,20,21, 24;83:8;150:8,9,10,17 302 (3) 59:9,13,18 305 (12) 7:17;26:22,24;57:1,3,3; 59:4,10,13,21,22,24 306 (14) 116:7,9;135:7,25;136:2,6, 16;149:10,14,15,16,19,21,22 30th (2) 43:5;85:21 313 (2) 39:16;133:9 318 (26) 7:15;26:22,24;39:17; 48:24;49:1,23;50:20;51:5,8, 12,13,15;54:9,23;55:2; 57:18;67:6;72:6;82:6,7;97:1; 101:19;102:2;112:3;113:11 31st (2) 42:20,24 324 (7) 133:4,8,16;146:22;148:18, 21,25 325 (9) 137:13,15,17;146:22; 148:18,21;149:2,3;196:5 35 (1) 117:21 362 (5) 145:11,12,14;146:22; 148:19 37.03.11 (1) 80:15 39 (2) 135:16;136:10 3rd (1) 164:18</p>	<p>4:46 (1) 236:7 40 (1) 7:10 40.03 (2) 209:1,5 400,000 (2) 62:9;128:24 42 (1) 7:12 48 (1) 7:15 49 (5) 162:5,6;165:25;213:21,22</p> <p style="text-align: center;">5</p> <p>5 (9) 80:23;83:13,14,14;100:25; 109:1;208:2,3,4 5,000 (1) 90:24 50 (2) 213:21,24 51 (1) 7:15 57 (1) 7:17 59 (3) 7:10,12,17 5th (5) 38:16;122:25;172:7; 173:10;227:11</p> <p style="text-align: center;">6</p> <p>6 (9) 49:19;50:19,20;51:4; 97:17;109:5;112:13;231:11; 232:4 600 (2) 26:16,19 604 (2) 26:16,20 63,000 (1) 85:10 63,645 (7) 76:15;83:16,22;85:2,15, 19;87:1 65 (1) 7:20</p>	<p>42:25;43:3;52:5,21;55:10, 12,16,23;56:16 75,200 (11) 52:7,12,24;54:25;76:20; 113:8,15,25;114:5,17;115:2 76 (1) 7:22</p> <p style="text-align: center;">8</p> <p>8:30 (1) 235:23 800 (2) 24:4,24 80s (1) 113:20 837 (1) 24:24</p> <p style="text-align: center;">9</p> <p>9 (8) 150:21;185:8,11;186:10, 15;191:16,17;209:1 9:00 (5) 235:22,25;236:1,2,4 90 (3) 50:25;112:10,16 900 (8) 24:7;25:7,12;28:9;40:24; 41:1,3,10 900s (2) 40:18,19 901 (7) 184:15,17,18;185:10,18, 22;186:9 907 (1) 202:21 90s (1) 111:23 914 (10) 7:20;65:9,11,13,21;66:15; 157:18,19,21;173:18 915 (12) 66:12;179:4,6,8,9,13,14, 25;180:14,21,23;190:6 916 (9) 179:4,7,19;180:3,15,21,23; 189:21;190:7 918 (4) 40:8,12,23;41:4 919 (2) 40:23;41:7 920 (1) 40:24 928 (6) 202:18,20;203:1;214:25; 215:4,5 929 (4) 80:12,14;207:15,18 940,000 (1) 58:2 941,000 (1)</p>	<p>74:14 941,400 (3) 74:12,14,19 97,700 (3) 58:13,19;74:17 99 (3) 51:1;112:10,16</p>
4	7		
<p>4 (8) 80:23;108:24;150:21,24, 25;190:4;207:24;208:1 4/20/2022 (1) 7:17 4/21/2023 (2) 7:10,12 4:30 (1) 229:1</p>	<p>7:30 (1) 235:24 700 (1) 26:20 700,000 (2) 56:1,17 703 (1) 26:21 75,000 (9)</p>		

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO

IN THE MATTER OF DISTRIBUTION OF) DOCKET NO.
WATER TO VARIOUS WATER RIGHTS) CM-DC-2010-001
HELD BY OR FOR THE BENEFIT OF A&B)
IRRIGATION DISTRICT, AMERICAN)
FALLS RESERVOIR DISTRICT #2,)
BURLEY IRRIGATION DISTRICT,)
MILNER IRRIGATION DISTRICT,)
MINIDOKA IRRIGATION DISTRICT,)
NORTH SIDE CANAL COMPANY, AND)
TWIN FALLS CANAL COMPANY)
_____)

BEFORE

HEARING OFFICER: GARY SPACKMAN

VOLUME II

Date: June 7, 2023, 9:02 a.m.

Location: Idaho Department of Water Resources
322 East Front Street, 6th Floor

REPORTED BY:

ANDREA L. CHECK, CSR No. 748, RPR, CRR

Notary Public

A P P E A R A N C E S

For the Idaho Department of Water Resources:

Office of the Attorney General

Idaho Department of Water Resources

BY MR. PETER A. WOOD, ESQ.

322 East Front Street, Suite 648

Boise, Idaho 83720-0098

pete.wood@idwr.idaho.gov

For the City of Pocatello:

Somach Simmons & Dunn, P.C.

BY MS. SARAH A. KLAHN, ESQ.

& MR. MAXIMILIAN C. BRICKER, ESQ.

1155 Canyon Boulevard, Suite 110

Boulder, Colorado 80302

mbricker@somachlaw.com

For the Cities of Bliss, Burley, Carey, Declo, Dietrich,
Gooding, Hazelton, Heyburn, Jerome, Paul, Richfield,
Rupert, Shoshone, and Wendell:

McHugh Bromley, PLLC

BY MR. CHRIS M. BROMLEY, ESQ.

& MS. CANDICE M. MCHUGH, ESQ. (Remotely)

380 South 4th Street, Suite 103

Boise, Idaho 83702

cmchugh@mchughbromley.com

A P P E A R A N C E S (Continued)

For the Surface Water Coalition, Twin Falls Canal
Company, North Side Canal Company, and Milner Irrigation
District, A&B, Burley Irrigation District:

Marten Law

BY MR. JOHN K. SIMPSON, ESQ.

& MR. TRAVIS L. THOMPSON, ESQ.

101 South Capitol Boulevard, Suite 305

Boise, Idaho 83702

jsimpson@martenlaw.com

tthompson@martenlaw.com

For the Minidoka Irrigation District, AFRD#2:

Fletcher Law Office

BY MR. W. KENT FLETCHER, ESQ.

1200 Overland Avenue

Burley, Idaho 83318-0248

wkf@pmt.org

For the City of Idaho Falls:

Holden, Kidwell, Hahn & Crapo

BY MR. ROBERT L. HARRIS, ESQ.

1000 Riverwalk Drive, Suite 200

P.O. Box 50130

Idaho Falls, ID 83405

rharris@holdenlegal.com

A P P E A R A N C E S (Continued)

For Idaho Ground Water Appropriators, Inc.:

Racine Olson, PLLP

BY MR. THOMAS J. BUDGE, ESQ.

& MS. ELISHEVA M. PATTERSON, ESQ.

201 East Center Street

Pocatello, Idaho 83201

tj@racineolson.com

elisheva@racineolson.com

For Madison Ground Water District, Henry's Fork Ground
Water District, Jefferson Clark Ground Water District:

Rigby, Andrus & Rigby Law, PLLC

BY MR. JERRY R. RIGBY, ESQ.

25 North 2nd East

Rexburg, Idaho 83440

jrigby@rex-law.com

For Bonneville-Jefferson Ground Water District:

Olsen Taggart, PLLC

BY MR. SKYLER C. JOHNS, ESQ.

P.O. Box 3005

Idaho Falls, Idaho 83403

sjohns@olsentaggart.com

A P P E A R A N C E S (Continued)

For Bingham Ground Water District:

Dylan Anderson Law

BY MR. DYLAN K. ANDERSON, ESQ.

P.O. Box 35

Rexburg, Idaho 83440

dylan@dylanandersonlaw.com

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

W I T N E S S E S

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

TESTIMONY OF JAY BARLOGI	PAGE
Direct Examination by Mr. Thompson	13
Cross-Examination by Mr. Bromley	24
Cross-Examination by Mr. Bricker	70
Cross-Examination by Mr. Budge	78
Cross-Examination by Mr. Anderson	99
Redirect Examination by Mr. Thompson	100
Recross-Examination by Mr. Budge	105
TESTIMONY OF GREGORY K. SULLIVAN	
Direct Examination by Ms. Klahn	111
Cross-Examination by Mr. Mr. Fletcher	198
Cross-Examination by Mr. Thompson	230
Cross-Examination by Mr. Budge	247
Redirect Examination by Ms. Klahn	253

I N D E X
E X H I B I T S

NO.	MARKED	RECEIVED
SWC		
1 -	***	23
1A -	15	23
IDAHO FALLS, POCA TELLO, AND COALITION OF CITIES		
332 -	***	48
334 -	***	49
337 -	***	69
338 -	***	48
347A -	118	125
363 -	60	69
364 -	65	69
365 -	194	194
BINGHAM GROUND WATER DISTRICT		
400 - (Offer of Proof Only)	***	10

1 P R O C E E D I N G S

2
3 HEARING OFFICER: So we're recording. We have
4 a new court reporter this morning.

5 Will you introduce yourself, please.

6 COURT REPORTER: My name is Andrea Check.
7 Good morning.

8 HEARING OFFICER: I'm sorry, Andrea. I cut
9 you off. Go ahead.

10 COURT REPORTER: I'm Andrea Check. Good
11 morning.

12 HEARING OFFICER: All right. Thanks
13 everybody. Let's see. We need to turn microphones on,
14 and maybe I'll turn this one on. I think we just leave
15 these on so that we don't have to worry.

16 And we have a number of participants who are
17 listening in remotely. I -- because -- well, it shows
18 Candice McHugh is on, at least for a time.

19 MS. MCHUGH: Yes. I'll be here this morning.

20 HEARING OFFICER: Okay. Thank you, Candice.

21 All right. And as I scan the room, it looks
22 like everyone else is here. We have at least one
23 preliminary matter to address this morning, and that's
24 an informal offer of proof that was presented or offered
25 late yesterday.

1 And the offer of proof, Mr. Anderson, I
2 understand, is that you want to have at least what's
3 been marked as Exhibit 400 lodged in the record as an
4 offer.

5 And this, at least, purports to be a report by
6 Darryll Olsen regarding economic impacts surrounding
7 water right, water supply restrictions.

8 And so I guess before I rule on this offer of
9 proof, Surface Water Coalition, do you have any
10 objection to this document being lodged but not being
11 part of the record?

12 MR. FLETCHER: Well, it's my understanding
13 it's being lodged for the purposes of the -- I think the
14 term you used was "informal offer of proof"?

15 HEARING OFFICER: Yeah.

16 MR. FLETCHER: And for that purpose, I don't
17 think we really have grounds for objection, but we would
18 object to it being introduced as an exhibit.

19 HEARING OFFICER: So based on my review and
20 the request for this document to be lodged as an offer
21 of proof, I'll allow it to come in, not as an exhibit,
22 but just as an offer of proof so that at least the
23 document is there. And if there's -- the reviewing
24 courts determine in some subsequent appeal that it
25 should have been considered, then it won't have to come

1 back.

2 (Exhibit 400 received for offer of proof
3 purposes only.)

4 HEARING OFFICER: Now, as part of this ruling,
5 I guess, I think it's important to go back and just
6 excerpt some of the prior decisions by the --

7 COURT REPORTER: Can you hang on for one
8 second?

9 HEARING OFFICER: Sure.

10 COURT REPORTER: My machine just stopped.

11 HEARING OFFICER: I thought you were
12 struggling with my inarticulate delivery.

13 COURT REPORTER: No. But I might need -- can
14 we go off the record for one minute?

15 HEARING OFFICER: Sure. That would be fine.

16 (Break taken.)

17 HEARING OFFICER: Back on the record.

18 Thank you, Andrea.

19 Okay. Well, the court reporter has said that
20 at least some of what was said she didn't capture, so
21 let me see if I can rehabilitate.

22 So it's my understanding that there were
23 actually two matters in front of me: One was a motion
24 to reconsider my ruling that I would not accept evidence
25 regarding the economic impacts of possible curtailment

1 resulting from the -- a delivery call and associated
2 methodology order amendment and also an informal offer
3 of proof.

4 And probably in the proper order of discussing
5 in this matter, I ought to at least address the motion
6 for reconsideration. And I'd just excerpted a couple of
7 passages from the Clear Springs decision, Clear Springs
8 Foods versus Spackman, issued in 2011 by the Idaho
9 Supreme Court where the Court said that: "A delivery
10 call cannot be denied on the grounds that curtailment of
11 junior appropriators would result in substantial
12 economic harm."

13 And then, further: "'Full economic
14 development'" -- which was argued yesterday and
15 referenced in the constitutional provisions -- "'Full
16 economic development of underground water resources'
17 does not mean that the groundwater appropriator who is
18 producing the greater economic benefit or would suffer
19 the greater economic loss is entitled to use of the
20 groundwater when there is insufficient water for both
21 the senior and junior appropriators. If that were the
22 basis for allocating water in times of shortage, then
23 water would be allocated among farmers based upon market
24 prices and their respective crops and their expected
25 yields."

1 And so from my perspective, this particular
2 issue has been addressed by the courts previously. And,
3 furthermore, it's not an issue that is part of the
4 Methodology Order and the underlying facts that were
5 considered in amending the Methodology Order.

6 So as a result, I'll again verbally deny the
7 motion to reconsider, but I will allow the document to
8 be -- the document marked as Exhibit 400 to be lodged in
9 the -- or at least be lodged with the record but not
10 part of the record if some reviewing tribunal wants to
11 take this up and reverses my ruling on the presentation
12 of evidence regarding economic harm and respective
13 economic comparisons.

14 Okay.

15 MR. BAXTER: Director?

16 HEARING OFFICER: Yes?

17 MR. BAXTER: Could you turn your microphone
18 on, please.

19 HEARING OFFICER: Oh, I'm sorry. Thank you.
20 We've been on and off and on and off. Thank you.

21 Okay. Are there other matters we need to talk
22 about this morning?

23 All right. We have a witness slated to be
24 called. I think the next witness is Jay Barlogi.

25 Mr. Barlogi --

1 Is that correct, Mr. Thompson?

2 MR. THOMPSON: Yes.

3 HEARING OFFICER: Mr. Barlogi, if you'll come
4 forward, please. If you'll raise your right hand.

5

6 JAY BARLOGI,

7 called as a witness by the Surface Water Coalition,
8 having been first duly sworn to tell the truth relating
9 to said cause, testified as follows:

10

11 HEARING OFFICER: Thank you. You may assume
12 the seat of discomfort.

13 Mr. Thompson?

14 MR. THOMPSON: Thank you. Travis Thompson for
15 A&B Irrigation District, et al.

16

17 DIRECT EXAMINATION

18 QUESTIONS BY MR. THOMPSON:

19 Q. Mr. Barlogi, can you please state and spell
20 your name for the record.

21 A. Yeah, my name is Jay Barlogi. It's J-a-y, and
22 the last name is B-a-r-l-o-g-i.

23 Q. And when did you start working for the
24 Twin Falls Canal Company?

25 A. I started working in 1993.

1 Q. And what positions have you held since that
2 time?

3 A. I started out as a ditch rider. I moved up to
4 the East End watermaster, moved from there into the
5 field supervisor position, and then moved from there
6 into the general manager position.

7 Q. And if you could look behind you, I think
8 there should be a binder of Surface Water Coalition
9 exhibits.

10 A. Thank you.

11 Q. If I could have you look at Exhibit 1, please.
12 Can you generally describe that document for
13 the record?

14 A. Yes. This is a document that I put together
15 that is titled, "Direct Testimony of Jay Barlogi." It
16 just kind of explains, more or less, how we operate at
17 the Twin Falls Canal Company.

18 Q. And that's based upon your personal experience
19 and work history with the company; is that correct?

20 A. Yes, sir.

21 Q. If you could turn to page 27 on that exhibit,
22 please.

23 A. Okay. I'm there.

24 Q. And is there a graph that depicts Twin Falls
25 Canal Company diversions 1988 through 2002?

1 A. Yes, sir.

2 Q. 2022. I'm sorry.

3 A. Yes, sir.

4 Q. And did you prepare that graph?

5 A. Yes, sir.

6 Q. What was the source of the data for that
7 graph?

8 A. That source was Water District 1 accounting
9 data.

10 Q. Director, if I might approach. I've got --

11 HEARING OFFICER: Yes.

12 MR. THOMPSON: -- a better copy marked as
13 Exhibit 1A.

14 (Exhibit 1A marked.)

15 Q. (BY MR. THOMPSON) Jay, can you describe
16 what's been marked as Exhibit 1A for the record, please.

17 A. Yes. This is a bar graph that I put together.
18 This -- each bar represents an individual year from
19 1998 -- or from 1988, rather, through 2022. And these
20 are our annual diversions from April 1st through
21 October 31st of each of those years since 1988.

22 Q. And is that just a larger version of that
23 graph contained in your pretrial testimony at page 27?

24 A. Yes, sir.

25 Q. Jay, since 2010, can you just generally

1 describe how the company delivers water to its
2 shareholders?

3 A. Certainly. We do it pretty much the same way
4 we always have. We divert water out of Milner Dam. We
5 divert it through our Shoestring Canal down to
6 Murtaugh Lake, which is a recharge -- or not a recharge,
7 but a re-regulating reservoir within the system. It
8 flows out of there into our Main Line Canal around the
9 Hansen Butte, where it hits forks where it bifurcates
10 into the High Line and the Low Line Canal that run all
11 the way to the west end of our system and both expire at
12 Deep Creek.

13 Off of all of those canals, the Shoestring,
14 the Main Line, the High Line, and the Low Line, there
15 are over 1,000 miles of smaller canals that come off of
16 those larger waterways where we divert water to our
17 shareholders out of over 4,000 different headgates that
18 we measure. As those individuals call in-season and ask
19 for their water to be turned on, our ditch riders take
20 those calls every morning between 7:00 and 7:30, and
21 then they go out and start delivering that water. They
22 go to one meter at a time, measure the appropriate
23 amount out of the gate, lock it up, and go on to the
24 next gate.

25 Q. And how about your maintenance activities, can

1 you just generally describe what the company does to
2 maintain its system?

3 A. Sure. Maintenance activities have really kind
4 of got, I guess, two seasons. Certainly during the
5 irrigation season our maintenance activities are
6 different than they are during the nonirrigation season.

7 During the irrigation season we have crews out
8 right now with several different mowing tractors mowing
9 weeds along the edges of the canals. As you can
10 imagine, this time of year the weeds are beginning to
11 grow, the grass is beginning to grow. It's important
12 that we maintain that weed and grass growth, as it
13 occludes the channels, forces us to push harder to get
14 the water through to the end.

15 We also have multiple excavators that spend
16 much of their time this time of year cleaning canals and
17 cleaning sediment out of the bottoms of canals. As we
18 start irrigating -- preirrigating bean ground this time
19 of year, the sediment ponds at the ends of the fields
20 and many of our water quality projects are beginning to
21 fill up or starting to fill up. So those excavators are
22 out right now cleaning canals, making sure the water
23 flows freely through those canals.

24 As you can imagine, this time of year, it's
25 early in the season, as we bring the water level in the

1 canals up, there's a leak that shows up here and there,
2 and the excavators are out making those repairs.

3 Moss growth is beginning to accumulate in the
4 waterways now. Generally, in the middle of June we have
5 to treat the main canals. But certainly throughout the
6 month of June we're putting chemicals in, and we're
7 eradicating moss out of the system before the moss
8 chokes the system up to the point that we cannot shove
9 the water through to those water users at the end.

10 That's pretty much the extent of the -- well,
11 that's a lot of what we do, anyway, this time of year.

12 During the nonirrigation season -- we
13 typically have at least a large project or two during
14 the nonirrigation season that can be -- that could be
15 new lining projects, it could be new water quality
16 projects.

17 And then we also do a lot of work on the
18 bottoms of the canals throughout the year. As you go
19 through the course of the season, as you can imagine,
20 the channel ends up with silt berms here and there that
21 need to get cleaned out, and we need to make sure that
22 the water flows really well through those main canal
23 systems.

24 We also have an extensive concrete program.
25 We have over 10,000 concrete structures on our system,

1 so it's really, really important that we replace those
2 on a regular basis. We always say if we replace 100 of
3 those a year, I could overturn our inventory of concrete
4 structures once every 100 years. So we do in excess of
5 100 concrete structures a year and those concrete
6 structures are --

7 COURT REPORTER: Mr. Barlogi, can you slow
8 down just a little bit for me, please.

9 THE WITNESS: Sure.

10 Those concrete structures are typically
11 measuring devices that we rehab or replace.

12 Several new ones come in every now and again
13 as water deliveries have changed as the transition from
14 gravity to sprinkler irrigation continues to be ongoing
15 on the project.

16 Maintenance crews are also -- maintenance --
17 the maintenance foreman and the field supervisor are
18 also spending a lot of time during the offseason out
19 working with water users. As they put sprinkler systems
20 in, we make sure that the way those sprinkler systems
21 are installed works well with our system and doesn't
22 create adverse impacts.

23 Q. (BY MR. THOMPSON) So do you have dedicated
24 staff for both maintenance and then water delivery
25 operations?

1 A. Yes, sir.

2 Q. And it's fair to say that there really is no
3 offseason for what you do in the canal?

4 A. No. No, there's not. No.

5 Q. And can you generally describe any larger
6 projects since 2010 that have been implemented to help
7 canal operations?

8 A. Certainly. We have -- we have -- since 2010
9 and prior, we have an ongoing list of projects that we
10 continue to try to identify and implement.

11 We've put in several different lining
12 projects. We've done lining projects on the
13 Low Line Canal, on the High Line Canal, on the
14 Shoestring Canal.

15 We've done canal work in the bottom of the
16 Main Line Canal. We've put in multiple different water
17 quality facilities. We've put in several different new
18 automated structures at the heads of some of these
19 waterways, and a few of these have specific diversions
20 within the canal system.

21 Somewhere around 2010, 2011, we built the
22 Kinyon Pond on the far west end of the system. That's
23 somewhat of a re-regulating reservoir down on the far
24 end of the High Line Canal.

25 Q. And those projects, would you characterize as

1 just helping you provide a level of service and delivery
2 to your shareholders as you always have?

3 A. Absolutely. Yeah. It's all in the interest
4 of providing a high level of service to our water users
5 while operating the system prudently.

6 Bear in mind, most of these activities are all
7 centered around the total capacity of the canal system.
8 And if the capacity gets compromised, then we're
9 operating with more risk than we need to be operating
10 with.

11 So we manage the weeds, we manage the moss, we
12 manage the flow in these waterways so as not to put any
13 additional pressure on the banks and cause possible
14 seeps or possible canal breaks throughout the season.

15 So we do everything we can to provide a high
16 level of service to our water users while operating the
17 system prudently.

18 MR. THOMPSON: That's all the questions I
19 have, Director. I'll turn Mr. Barlogi over for
20 cross-examination.

21 Oh, yeah, those two exhibits I would offer,
22 Exhibits 1 and 1A, into the record.

23 HEARING OFFICER: Any objection to the
24 documents marked as Exhibits 1 and 1A?

25 The attorneys for the groundwater users have

1 had a chance to, apparently, review this written
2 testimony of Jay Barlogi and are comfortable with the
3 admission of this document?

4 MR. BROMLEY: Yes.

5 HEARING OFFICER: Mr. Budge?

6 MR. BUDGE: I'm comfortable with it generally,
7 but there's one item of hearsay that I would like to
8 have stricken from it. It's on page 22. And it's
9 lines 17 through 20. And it says, "Somewhere in the
10 archives of historical information about the Twin Falls
11 Canal Company a state engineer was quoted as saying,"
12 and then there's a quote. So that component of the
13 prefiled testimony I would move to be stricken; the rest
14 of it I'm okay.

15 HEARING OFFICER: Mr. Thompson?

16 MR. THOMPSON: That's fine. I can ask
17 Mr. Barlogi on redirect about that statement.

18 HEARING OFFICER: Okay. Well, normally, I'm
19 reluctant to accept written testimony because I like to
20 hear the testimony of the witness, but in the interest
21 of time and recognizing that this hearing has been
22 expedited and we're trying to finish as soon as
23 possible, I'll allow testimony into the record with the
24 qualification that the quoted material and the written
25 testimony is excerpted or deleted out of the testimony.

1 And so with that qualification, I'll accept
2 Exhibit 1 and Exhibit 1A into evidence.

3 (Exhibits 1 and 1A received.)

4 HEARING OFFICER: Mr. Budge.

5 MR. BUDGE: Just logistically, does that mean
6 the Department will take the action of redacting that
7 portion of the exhibit?

8 HEARING OFFICER: Well, at least right now,
9 I'm anticipating that there might be further questions
10 related to that language. So at least right now, I'll
11 leave it there, and let's see where it goes, Mr. Budge.
12 But please remind me as we go through their testimony,
13 though. Thank you.

14 Okay. Mr. Bromley.

15 MR. BROMLEY: Thank you, Director.
16 Chris Bromley on behalf of the Coalition of Cites.

17 Mr. Barlogi, I took your deposition in
18 Twin Falls. And thank you for being here.

19 And I do want to say I appreciate both what
20 the attorneys from Surface Water Coalition and
21 Mr. Barlogi, Director, that they prepared the prefiled
22 testimony. It's helped us speed this process up. I
23 know, ordinarily, it's not something we would do, but in
24 the interest of time, it is helpful. And Mr. Barlogi
25 and I discussed all of these topics, really, at his

1 deposition. So when I read the prefiled testimony, it
2 meshed with, you know, what we discussed at the
3 deposition. So I appreciate that we were able to
4 truncate that, so thank you.

5 HEARING OFFICER: Good. Thank you.

6

7

CROSS-EXAMINATION

8

QUESTIONS BY MR. BROMLEY:

9

10

11

12

Q. Okay. Mr. Barlogi, I'd like to talk first
about Twin Falls Canal Company's shares. So according
to your direct testimony, there are 202,690.93
outstanding shares; is that correct?

13

A. Yes, sir.

14

15

Q. Okay. But Twin Falls Canal Company delivers
to fewer than 200,000 acres; isn't that correct?

16

A. Yes, sir.

17

18

Q. Okay. What's the current assessment for the
company?

19

A. Current maintenance fees per share?

20

Q. Yes, sir.

21

A. It's \$27.

22

23

Q. And how often does the company increase its
assessments?

24

25

A. I would say as needed. I think this last
assessment increase was last year. I think -- I don't

1 know. I would tell you as needed. I don't think we'd
2 had an increase prior to that for four or five years.

3 Q. What was the prior assessment fee? Do you
4 recall?

5 A. 26.

6 Q. Okay. Is that generally what it goes up by, a
7 dollar or so?

8 A. Yes.

9 Q. Thank you.

10 You stated in your deposition that the company
11 operates on a continuous flow; is that correct?

12 A. Yes.

13 Q. And you'd agree, however, that every acre
14 within the project isn't irrigated every day; correct?

15 A. Yes.

16 Q. You also stated in your deposition that the
17 company doesn't require its farmers to rotate water with
18 one another; is that correct?

19 A. Yes.

20 Q. But if Twin Falls rotated, wouldn't you agree
21 that the supply would be extended?

22 A. No.

23 Q. Why is that?

24 A. Well, you suggested that they should be
25 rotating water between farmers.

1 Q. That's correct. And if I didn't ask that well
2 in the question, that is the question, that having
3 farmers rotate water with one another. So, you know,
4 Farmer A is on a Monday; Farmer B is on a Tuesday. They
5 rotate with one another. So water is moving from field
6 to field.

7 Do you follow that?

8 A. I do. And I think you need to understand our
9 project a little bit. One farmer has likely got a field
10 of hay and a field of grain and a field of corn and a
11 field of potatoes and sugar beets, and he rotates within
12 his farm. And that farmer is generally using his water
13 every day throughout the irrigation season. And he's
14 rotating within his own farm. The next farmer has a
15 very similar situation throughout the project.

16 So, no, they don't rotate between farm --
17 between farmers. They rotate within their farm.

18 Q. Correct. And you had said that farmers are
19 not rotating with one another; so, you know, one farm is
20 on, the next farm is off.

21 I'm asking you, wouldn't it extend the supply
22 of water if Twin Falls Canal Company farmers were to
23 rotate water with one another?

24 A. No.

25 Q. And why is that?

1 A. Well, I would say that on any given day, the
2 diversion is meeting the needs of the farmers every day.
3 So I don't know where there would be a place to rotate
4 that water to.

5 Q. But not every acre is irrigated every day;
6 correct?

7 A. Correct.

8 Q. So if demand is off on one field and demand is
9 on on another field and farmers are rotating with one
10 another, as we see in other parts of the state, it ought
11 to reduce demand; correct?

12 A. Yeah. I suppose if there was a need to do
13 that, but there is not a need to do that. Again, they
14 rotate within their own farm to do that.

15 Q. Okay. How does the company track share
16 ownership?

17 A. Well, it's tracked through the certificates.
18 We have a program in the office, they call it "Magic,"
19 who attracts -- who owns all of the shares within the
20 project. As land sells, folks come in, we change the
21 names on the certificates and transfer those shares to
22 the new owners. Water moves from one farm to another.
23 The certificate is changed to reflect the new point of
24 diversion, the new place of use.

25 Q. Is that important for the ditch riders to

1 know?

2 A. Absolutely. Of course.

3 Q. How does the company track changes in place of
4 use for shares?

5 A. Well, if the place of use changes, we call
6 that a transfer. There is a transfer policy, and those
7 folks will come in, and they will apply for the
8 transfer. That paperwork then goes to the watermasters
9 first who can look through the paperwork and identify if
10 that transfer and physically moving that water from one
11 place to another is feasible, or does it present a
12 capacity issue? Does it present a flooding issue? Does
13 it present a measurement issue at the headgate?

14 And if it does, of course, he will put his
15 suggestions in there that this is not a very good
16 transfer; and if it doesn't, then he will sign off on
17 it. And then it goes to the board of directors, who
18 reviews the application, compares it to the transfer
19 policy, and if it complies with all of the parameters of
20 the transfer policy, then they will approve it. If it
21 doesn't, then they do not approve it.

22 Q. Thank you.

23 At your deposition, we discussed the
24 percentage increase in sprinklers from 2008 to present.

25 Do you recall that discussion?

1 A. I do.

2 Q. I'll try and do a better job of finishing my
3 question, and look at you.

4 A. I'll do better as well.

5 Q. Thank you, Mr. Barlogi.

6 Okay. So when we were discussing on that
7 point, do you still agree that, in 2008, the percentage
8 of fields that were irrigated by sprinkler was about
9 25 percent?

10 A. Yeah. Yes, I do.

11 Q. Okay. And then in your deposition, we also
12 talked, and I see it as well in your direct testimony,
13 that you state the Twin Falls Canal Company is
14 approximately 50 to 60 percent sprinkler irrigated now?

15 A. Yes.

16 Q. So if -- the company's approximately doubled
17 the number of sprinklers on the project in the last
18 15 years; is that correct?

19 A. Certainly doubled the percentage, yes.

20 Q. Okay. And as for conversion to drip
21 irrigation, which we talked about in your deposition, we
22 were discussing a 400-acre field that's now lettuce; is
23 that correct?

24 A. Well, I think it's multiple different fields,
25 but I think there is about 400 acres of lettuce on the

1 project this year.

2 Q. Okay. So Mr. Barlogi, let's look at
3 Exhibit 332.

4 All right. Are you there, Mr. Barlogi?

5 A. Yes, sir.

6 Q. Do you recognize this exhibit?

7 A. I do.

8 Q. Okay. This was an exhibit we talked about at
9 your deposition. And my understanding of this exhibit
10 is that it explains what the deliveries are year by
11 year, month by month, and day by day; is that correct?

12 A. What the rate of deliveries are, yes.

13 Q. Thank you.

14 And I notice the way that this exhibit has now
15 been put together, it's kind of out of order in the
16 years, but we've got years from -- oh, let's see -- 1990
17 to, I think, about the present.

18 Is that what you see?

19 A. Yes.

20 Q. And so we can look at this -- and just to make
21 it easy, we'll be on the first page. In the 1990 -- and
22 I see -- and this was produced -- is yours produced in
23 color?

24 A. Yes.

25 Q. Okay. Great.

1 So the blue represents three-quarters of a
2 miner's inch -- is that correct? -- in 1990?

3 A. Yes, the .75 blue.

4 Q. Yes, sir.

5 And so in 1990, it was a delivery of .75, or
6 three-quarters of a miner's inch, from the beginning to
7 the end of the irrigation season; is that what that
8 shows?

9 A. Yes.

10 Q. Thank you.

11 And so then in a year like 1992, just to keep
12 it simple and we're on the same first page, the company
13 started with a delivery of three-quarters of a miner's
14 inch from April until May 3rd; correct?

15 A. Yes.

16 Q. And then shifted on May 4th to 0.625, which is
17 the equivalent of five-eighths of a miner's inch;
18 correct?

19 A. Yes.

20 Q. And then on May 18th through the rest of the
21 season, the company then reduced to .5, which is half a
22 miner's inch; correct?

23 A. Yes.

24 Q. Okay. And so we could go through that exhibit
25 and look at all of these different years, but I don't

1 see a reason to do that.

2 The benefit of the exhibit, as I understood
3 it, Mr. Barlogi, from the deposition, was this helps
4 explain what the company was delivering to its farmers;
5 true?

6 A. Yes.

7 Q. Thank you.

8 Okay. How much is the company delivering this
9 season, today?

10 A. Currently, we are currently delivering
11 three-quarters of an inch per share.

12 Q. Let's talk about cropping patterns.

13 Okay. What have you noticed, Mr. Barlogi,
14 with cropping patterns over the last 15 years?

15 A. I think the main thing that we've noticed over
16 the last 15 years has been related to the dairy
17 industry. The dairy industry has moved into our area in
18 a very big way, and so high-water-consumptive crops have
19 moved in as the dairies are looking, constantly, for
20 alfalfa and corn to feed the cows. So alfalfa and corn
21 acres have increased significantly.

22 I would also add that with the sprinklers and
23 the sprinkler ground continuing to convert from gravity
24 to sprinkler has brought the potato market, I think,
25 further into the project, historically.

1 I think currently there are significantly more
2 potatoes grown on the project than there were
3 historically.

4 Q. How many acres do you think are planted in
5 alfalfa this year?

6 A. I wouldn't have any idea.

7 Q. How about corn?

8 A. No idea.

9 Q. How about potatoes?

10 A. No idea.

11 Q. But they've gone up, in your estimation?

12 A. Certainly.

13 Q. Okay. We talked in your deposition -- you
14 were saying that there are farmers within Twin Falls
15 Canal Company who are now getting five cuttings of hay;
16 is that correct?

17 A. I think, again, they're trying to meet the
18 demands of the dairy industry. So if they can get it,
19 they will.

20 Q. And could you explain how that's possible?

21 A. Yeah, I can, to some extent. I'm not a
22 farmer. I know that very often times as we get into the
23 spring, the dairies have exhausted their supply of feed.
24 So quite often you'll see a hay crop go off when it's
25 not near as high as it used to be, but they'll move in

1 there with the green choppers, and they'll take off the
2 crop really quick and get it to the dairy industry.

3 And you'll see the same kind of thing with
4 that last cutting. So often the first and last cutting
5 of those five cuttings aren't real big cuttings.

6 But, absolutely, the needs of the dairy
7 industry drive the market.

8 Q. And what we talked about at your deposition
9 was something I believe you were calling a "green chop."

10 So the hay, it's being cut, and it's being
11 taken off the field almost immediately; is that correct?

12 A. Yes, sir.

13 Q. How long has that practice been going on?

14 A. Well, I would say that -- gosh, I don't know
15 how long. It came in kind of with the dairies.

16 Q. And the former practice was to cut hay, you'd
17 let it dry, you wouldn't irrigate the field.

18 Eventually, it would get baled, picked up in some way,
19 and then water would be put back on 7 to 10 to 14 days
20 later; is that right?

21 A. Yes.

22 Q. And that's changed now with the dairy
23 industry?

24 A. Yes.

25 Q. Okay. Do you know how many acres are getting

1 five cuttings of hay?

2 A. I do not.

3 Q. And I believe you understand that the Director
4 is now using the ESP model and what's referred to as
5 "transient" as opposed to "steady state"?

6 A. Yes.

7 Q. And that's changed the curtailment date. And
8 currently we have a 1953 curtailment date to produce
9 75,200 acre-feet to Twin Falls.

10 Do you understand that?

11 A. Yes.

12 Q. Do you think it's reasonable to curtail
13 groundwater rights junior to 1953 so some Twin Falls
14 Canal Company farmers can get five cuttings of hay?

15 A. I guess I wouldn't prospect to what is
16 reasonable.

17 Q. Do you think it's fair?

18 A. I guess I wouldn't argue fairness either.

19 Q. Let's talk about subdivisions, Mr. Barlogi.
20 And if you could turn to Exhibit 334.

21 All right. Do you recall this exhibit?

22 A. Yes, I do.

23 Q. We talked about it at your deposition, and you
24 agreed with me that, based on what's shown in the graph,
25 that Twin Falls County has grown by 19 percent since

1 2010. Correct?

2 A. Yes.

3 Q. Okay. And you also stated during your
4 deposition, Mr. Barlogi, that, in your opinion, most of
5 the growth has been in the cities; is that correct?

6 A. Yes.

7 Q. So as to subdivisions, wouldn't you agree that
8 rooftops, sidewalks, driveways, patios, and roads can't
9 be irrigated?

10 A. Yes.

11 Q. Let's look at Exhibit 171. So you'll need
12 another binder.

13 A. I'm sorry. Did you say 171?

14 Q. I did, yes.

15 Are you on Exhibit 171?

16 A. I am.

17 Q. And what's the title of that exhibit?

18 A. "Estimate of Non-Irrigated Acres Within
19 Twin Falls Canal Company Service Area."

20 Q. And I'll represent to you, Mr. Barlogi, this
21 was a document that was made an exhibit in the 2008
22 hearing. It was prepared by SPF Water Engineering on
23 behalf of the Idaho Ground Water Appropriators. And it
24 was looking at exactly what it says in the title;
25 nonirrigated acres.

1 MR. THOMPSON: Mr. Director, I'm just going to
2 lodge an objection, I guess, to prior exhibits contained
3 in the underlying record in this case. I think it's
4 unduly repetitious to have to go through this again. We
5 did this once, we don't need to go through every exhibit
6 that's already been part of the record and what the
7 Department has considered in developing the methodology.

8 MR. BROMLEY: If I may respond?

9 HEARING OFFICER: Sure.

10 MR. BROMLEY: Well, Director, you know, we
11 heard from the Court that this is an ongoing delivery
12 call. We have heard -- and I'll get to the point with
13 Mr. Barlogi with some foundation -- that he has a belief
14 that subdivisions require more water to be applied.

15 I'm not talking about specific acres, but we
16 can certainly get to there, Step 1 requires that. But
17 what I'm trying to get at is use of water within
18 subdivisions with an exhibit that's in the record in
19 this ongoing delivery call to establish foundation with
20 Mr. Barlogi about his opinions that subdivisions use as
21 much or more water than an irrigated field.

22 HEARING OFFICER: So let me understand,
23 Mr. Thompson. This document titled "Estimate of
24 Non-Irrigated Acres Within Twin Falls Canal Company
25 Service Area" is a document that was previously

1 submitted in a delivery call proceeding for the
2 Methodology Order?

3 MR. THOMPSON: It was submitted in the 2008
4 hearing considered by the hearing officer,
5 Justice Schroeder, at that time, part of the record for
6 that proceeding.

7 HEARING OFFICER: So your objection is that
8 this document shouldn't come into the record because
9 it's already previously been considered?

10 MR. THOMPSON: That would be my objection.

11 HEARING OFFICER: Okay. I'll overrule the
12 objection. I don't see harm in this document being in
13 the record again.

14 Mr. Bromley, go ahead.

15 MR. BROMLEY: Thank you, Director. It already
16 is part of the record, and we're trying to make it
17 easier by pulling documents that are, in our opinion,
18 helpful.

19 Q. (BY MR. BROMLEY) So, Mr. Barlogi, let's look
20 at page 36.

21 MR. THOMPSON: Chris, Bates stamp, please?

22 MR. BROMLEY: As far as I know, it's 36,
23 Travis. I don't see a Bates stamp on it. I see, at the
24 bottom of Exhibit 171, dash, page 36. And it's page 36
25 on the PDF, too.

1 Q. (BY MR. BROMLEY) Are you there, Mr. Barlogi?

2 A. I am.

3 Q. And when I look at this, I see what, you know,
4 I would call a typical subdivision with curbed streets
5 and cul-de-sacs and roads.

6 Is that what you see?

7 A. I do.

8 Q. I see at the bottom it's called out as
9 "Figure 6, Urban Subdivision 3 (North Pointe)"?

10 A. [Witness nods head.]

11 Q. Okay. So we're on the same page, then.

12 So in your deposition and in your direct
13 testimony you stated that subdivisions require the same
14 amount of water or more.

15 Do you recall that testimony?

16 A. I do.

17 Q. Is this your opinion as to subdivisions, or
18 has Twin Falls Canal Company done any studies to prove
19 this?

20 A. I would say currently this is not an opinion,
21 this is a fact. As I told you in the conversation we
22 had last week, if you develop land within the City of
23 Twin Falls, they require that you have a share per acre.

24 So what my company does is when a water user
25 calls and orders his water on, I'm obligated to turn on

1 the amount of water that he has, which is a share per
2 acre.

3 Q. Okay. So have you done any studies that show
4 that use of water in subdivisions -- so looking, again,
5 at this page 36 -- with many fewer acres that cannot be
6 irrigated, as you agreed with me previously, due to
7 rooftops, streets, sidewalks, and such -- what studies
8 do you have that show that use of water in a subdivision
9 is more intensive than on an irrigated farm?

10 A. I don't think canal company -- this canal
11 company doesn't do that kind of study, no.

12 Q. Okay. Thank you.

13 So on page 27 of your direct testimony -- and
14 then Mr. Thompson gave us -- I think it's now marked
15 1A --

16 MR. BROMLEY: Travis --

17 MR. THOMPSON: Yes.

18 MR. BROMLEY: -- is that right?

19 Q. (BY MR. BROMLEY) -- which is this graph that
20 Mr. Thompson had marked as Exhibit 1A.

21 It's now a loose -- yeah, we don't need to go
22 into the binder. Helpful to pull that out.

23 So looking at Exhibit 1A, it seems to be, in
24 what you were saying, that the company diverts at a
25 fairly consistent rate of 1.1 million acre-feet;

1 correct?

2 A. Yes.

3 Q. And so I'll just represent to you,
4 Mr. Barlogi, that if the company's diverting
5 1.1 million acre-feet for irrigation of 190,000 acres,
6 the volume of water that's available per acre -- just
7 simple math division -- is approximately 5.8 acre-feet.

8 Would you accept that as correct?

9 A. Yes.

10 Q. Thanks.

11 So if a subdivision reduces the irrigated area
12 by half and Twin Falls Canal Company farmers are using
13 up to 5.8 acre-feet -- that's what we were just
14 discussing -- you're saying subdivisions are using at
15 least 11.6 acre-feet?

16 A. I'm saying that they are entitled to the same
17 diversion rate.

18 No, they are not using that. No, that's not
19 what I'm saying.

20 Q. So if the irrigated area is half -- let's
21 start it this way, if a 40-acre field is taking
22 5.8 acre-feet of water, the subdivision has contracted
23 that space by half due to hardening of acres, only half
24 of those acres are receiving the same volume of water,
25 which would be 11.86 acre-feet; correct?

1 A. Yes.

2 Q. Let's talk about return flows, Mr. Barlogi.
3 So you stated in your direct testimony, and we also
4 discussed in your deposition, the Twin Falls Canal
5 Company tracks return flows; correct?

6 A. Yes.

7 Q. And I'd like to just talk about what that's
8 made up of. So when the company is tracking return
9 flows, does that include local runoff?

10 A. To some extent.

11 Q. How about coulees?

12 A. As they are a part of our system, yes.

13 Q. Okay. And what about the tributaries?

14 A. I assume you're talking about Rock Creek, and
15 we do not monitor those, no.

16 Q. But if those were monitored and water was
17 going into them off of the project, that would be
18 something that would be part of a return flow?

19 A. We monitor the location where the system
20 spills into the tributary, not the tributary.

21 Q. Great. Thank you.

22 So at your deposition, you said you spoke with
23 Matt Anders about the company's return flows to the
24 Snake River below Milner.

25 Do you recall that testimony?

1 A. Yes.

2 Q. And in your deposition, you stated that
3 Twin Falls was returning a significant percentage of
4 water.

5 Do you recall that testimony?

6 A. No, I'm going to argue your words. I don't
7 believe I stated that we were returning a significant
8 amount of water. I think I said in my testimony that a
9 pie chart that we had seen suggested that we were, off
10 of our return flows, spilling significantly more water
11 than we feel that we are.

12 Q. Okay. And thank you for correcting me on
13 that, Mr. Barlogi. That's what I also see in your
14 testimony, that you were having a discussion with
15 Mr. Anders about what, in your words, he was looking at
16 as a significant percentage, and you were having a
17 discussion with Mr. Anders about you didn't think it was
18 that much?

19 A. Yes.

20 Q. Whatever it was that Mr. Anders was showing
21 you?

22 A. [Witness nods head.]

23 Q. So is it true that Twin Falls is returning in
24 excess of 150,000 acre-feet per season?

25 A. I don't know. I don't know that I've totaled

1 it per season.

2 Q. Okay. And I'll represent to you -- and
3 testimony will come in later -- but would it surprise
4 you that Twin Falls Canal Company is returning in excess
5 of 300,000 acre-feet per irrigation season?

6 A. Yes, I don't believe that number.

7 Q. Okay. Do you know if the return flow
8 information that you discussed with Mr. Anders was
9 incorporated into the Methodology Order?

10 A. No, I don't believe it had anything to do with
11 it.

12 Q. And how many power plants are within
13 Twin Falls Canal Company's boundary?

14 A. I would -- I'm going to throw a number out
15 there and tell you ten.

16 Q. What was the most recent power plant that was
17 constructed?

18 A. The most recent one is the Midway Power Plant.

19 Q. Do you recall when that was built?

20 A. Yeah, I want to tell you 2005, '6, '7-ish.

21 Q. Okay. And let's turn to Exhibit 338.

22 MR. THOMPSON: Mr. Director, before we start,
23 I will object to this exhibit. I can explain why if
24 you'd like.

25 HEARING OFFICER: Okay. Well, it's a

1 preliminary objection. I'll allow counsel to try to lay
2 a foundation, and then I'll anticipate an objection
3 forthcoming.

4 Mr. Bromley?

5 MR. BROMLEY: It was a deposition exhibit.
6 I'll work through this.

7 Q. (BY MR. BROMLEY) Mr. Barlogi, you recall this
8 exhibit?

9 A. I do.

10 Q. And at your deposition, you discussed this
11 exhibit with Mr. Johnson [sic]; correct?

12 A. Yes.

13 Q. Okay. And you highlighted the power revenue
14 in yellow; correct?

15 A. Well, I highlighted what I understand to be
16 the power revenue. Typically, when I look through these
17 documents, I have my accountant beside me.

18 Q. So you're aware of what this document is? You
19 understand the document?

20 A. No, not thoroughly.

21 Q. So the yellow that you highlighted, what did
22 you highlight? We discussed this at your deposition
23 that you were highlighting revenue that the company was
24 realizing from hydropower generation; correct?

25 A. Yes, that was the attempt, but we struggled as

1 we went through it and as we highlighted, but that was
2 the attempt.

3 Q. So what were the struggles?

4 A. Well, for example, you can see Twin Falls
5 Energy Midway reimbursement. We're not certain that
6 that was revenue or whether that was expense that came
7 back as a result of costs incurred.

8 Q. And your counsel can clean this up, I suppose,
9 on redirect. We've produced this exhibit previously.

10 The more water the Twin Falls Canal Company
11 returns, the more power revenue the company will
12 realize; correct?

13 A. You know, our three big producers are
14 South Forks Hydro, Midway Power, and Lower Low Line.
15 Those are power plants that we own or are partners in.
16 Those are the meat of all the income.

17 As I told you, there are probably another
18 seven other projects in the system. We don't receive
19 royalties from all of them. Some of them we do. They
20 are privately owned. They are much smaller plants.
21 And, yes, they exist on the tail ends or the returns of
22 those drains. And so, absolutely, if there's more water
23 there, they produce more, which makes our -- I believe
24 we receive about half a percent from a base value as
25 royalty from those.

1 Q. Thank you.

2 MR. BROMLEY: I'll offer Exhibit 338.

3 HEARING OFFICER: Mr. Thompson?

4 MR. THOMPSON: Yeah, I'll just object to the
5 relevance, I guess. The economic issue has already been
6 addressed by the Director. You know, if we want to get
7 profit and loss statements from every water user, we can
8 certainly do that. It's beyond the scope of this
9 proceeding. Mr. Barlogi testified to the fact that they
10 do receive income from hydropower operations incidental
11 to the irrigation deliveries. Putting this type of
12 exhibit in the record is irrelevant.

13 HEARING OFFICER: Mr. Bromley?

14 MR. BROMLEY: It doesn't have anything to do
15 with the economic benefit between how much revenue a
16 groundwater user would realize if allowed to stay on
17 versus the economic benefit that a surface water user
18 realizes by being able to stay on. That's the economic
19 issue that's being discussed at Clear Springs. It's not
20 this.

21 HEARING OFFICER: Mr. Barlogi, is this
22 document a document from Twin Falls Canal Company
23 records?

24 THE WITNESS: This document is a document that
25 was created by our accountant; and yes, this is -- comes

1 from us.

2 HEARING OFFICER: Mr. Thompson, I agree with
3 Mr. Bromley. The purpose of this is not to compare
4 economic benefits or detriments from possible
5 curtailment. My understanding is the purpose of this
6 document is at least to show that there may be some
7 incentive for additional diversions of water not
8 necessary for irrigation, and, as a result, I'll receive
9 it into evidence.

10 So the document marked as Exhibit 338 is
11 received into evidence.

12 (Exhibit 338 received.)

13 MR. BROMLEY: Thank you, Director. And before
14 I go on to the next topic, let me go back and let's
15 offer and admit the exhibits that we've discussed.

16 So we had Exhibit 332, which were the headgate
17 deliveries. This was the colorful document that showed
18 three-quarters, five-eighths, half-inch. Offer that for
19 admission.

20 HEARING OFFICER: Any objection?

21 Hearing no objection, the document marked as
22 Document 332 is received into evidence.

23 (Exhibit 332 received.)

24 MR. BROMLEY: The next one that we talked
25 about was Exhibit 334, which was a population graph of

1 Twin Falls County, with Mr. Barlogi agreeing with what
2 the graph shows, which is the county has grown by
3 19 percent since 2020. I would offer that into
4 evidence.

5 HEARING OFFICER: Any objection?

6 MR. THOMPSON: Yeah, I'll object to this
7 exhibit. There's no foundation.

8 MR. BROMLEY: Well, Director, it's a document
9 that's sourced off the internet with what says census
10 data. That's kind of the best that we can do.
11 Mr. Barlogi didn't disagree with me that Twin Falls
12 County has grown.

13 THE WITNESS: Can I offer a comment?

14 MR. BROMLEY: No.

15 HEARING OFFICER: I'll receive the document
16 into evidence. So the document marked as Exhibit 334 is
17 received into evidence.

18 (Exhibit 334 received.)

19 MR. BROMLEY: Okay. That brings me up to
20 current, Director.

21 Q. (BY MR. BROMLEY) Mr. Barlogi, I'd like to
22 talk about irrigated area. So at your deposition, you
23 said you were familiar with government programs like CRP
24 and CREP that pay farmers money to fallow the fields.

25 Do you recall that testimony?

1 A. I do.

2 Q. And you stated that -- in your deposition
3 testimony -- that the company doesn't keep track of
4 acres that are enrolled in these programs; correct?

5 A. Yes.

6 Q. Wouldn't it be helpful for the company to know
7 which acres are enrolled in these programs?

8 A. I am somewhat of the opinion that there are no
9 acres enrolled in those programs on our tract or we
10 would be aware of them.

11 Q. Okay. But in your deposition, you said that
12 the company doesn't keep track of these acres. I
13 suppose that's a different question than: Are there
14 acres like that enrolled within the tract?

15 A. Yeah, I suppose it's relative. If there are
16 no acres enrolled, then, no, we don't keep track of
17 them.

18 Q. So your opinion is there are no acres enrolled
19 in CRP or CREP within your tract?

20 A. That is my opinion.

21 Q. Let's say, though, that there were acres
22 enrolled in those programs within the company's
23 irrigation boundary. Don't you think it would be worth
24 knowing that you have fallowed acres within the tract?

25 A. Certainly, if there were.

1 Q. And at your deposition, we talked about your
2 familiarity with farmers who irrigate a field for a year
3 or two, and then idle that field in order to rebuild
4 soil health.

5 Do you recall that testimony?

6 A. No, I do not. I do not recall talking about
7 fields that laid idle for a couple of years.

8 Q. You're not familiar with farmers who irrigate
9 a field for a number of years, take the crop off, and
10 let the field rehabilitate itself through nature by not
11 having a crop on it for a year?

12 A. I am not, no.

13 Q. Wouldn't it be helpful for the company to know
14 which fields are idled?

15 MR. THOMPSON: Objection; asked and answered.

16 MR. BROMLEY: The question I asked was as to
17 CRP and CREP. The question I'm asking now, Director, is
18 as to idling the fields.

19 HEARING OFFICER: I'll allow the question.

20 THE WITNESS: Assuming there were fields
21 idled, of course it would.

22 Q. (BY MR. BROMLEY) So an idled field or a field
23 enrolled in CRP or CREP has no water demand; true?

24 A. Again, I have no familiarity with lands that
25 are enrolled in CREP.

1 Q. But if a field is idled, it's not being
2 irrigated, it doesn't have a water demand; correct?

3 A. It certainly doesn't have a crop water need,
4 yes.

5 Q. Does Twin Falls Canal Company keep track of
6 strip malls, big-box stores, and industrial parks that
7 have been built within the project boundary?

8 A. We do not.

9 Q. And isn't it true that acres that are hardened
10 for commercial and industrial developments have no water
11 demand?

12 A. No, not completely.

13 Q. And what is the water demand?

14 A. Many and most of the commercial developments
15 still have some green space around them that has a water
16 demand.

17 Q. So a rooftop, a parking lot, sidewalks,
18 they're not receiving water; correct?

19 A. No.

20 Q. Mr. Barlogi, it was discussed during your
21 deposition that you're familiar with the Department's
22 requirement and the methodology, which is referred to as
23 "Step 1," that the company state annually how many acres
24 it's irrigating.

25 Do you recall that?

1 A. I do.

2 Q. And in your deposition you stated you didn't
3 know how many acres Twin Falls Canal Company's
4 irrigating; correct?

5 A. Yes.

6 Q. At your deposition, Mr. Budge, on behalf of
7 IGWA, provided you with copies of each letter that the
8 company has sent to the Department over the years
9 regarding the company's irrigated area for purposes of
10 the Methodology Order.

11 Do you recall that line of questioning?

12 A. Yes.

13 Q. And Exhibit 337 -- if you could turn to
14 that -- do you recognize those documents?

15 A. Yes.

16 Q. And those are the documents that you went
17 through with Mr. Budge; correct?

18 A. Yes.

19 Q. So if Twin Falls Canal Company doesn't keep
20 track of the number of acres that it's irrigating, how
21 is it that the company can provide the Department with
22 an accurate count of the number of acres that are being
23 irrigated each year?

24 A. We are required to represent whether or not
25 our acreage has changed by more than 5 percent every

1 year. 5 percent of 194,000 is nearly 10,000 acres.
2 It's very easily -- easy to know that we have not
3 changed anything to the tune of 10,000 acres. We very
4 carefully monitor transfers in water that moves within
5 the project.

6 There are changes, there is development there,
7 but 10,000 acres equates to about 15 square miles.
8 There's been development in our area, but there hasn't
9 been anywhere close to that kind of development in our
10 area.

11 Q. You told me, Mr. Barlogi, that you don't know
12 how many acres the company is irrigating; correct?

13 A. Yes.

14 Q. At your deposition, Mr. Barlogi, I asked you
15 what the company's goals are in the delivery call.

16 Do you recall that question?

17 A. Not that specifically, no.

18 Q. And your answer to my question, Mr. Barlogi,
19 was that the company has no goals.

20 Do you recall that answer?

21 A. So I don't specifically remember that specific
22 question.

23 Q. Okay. I'm going to hand you, Mr. Barlogi,
24 your deposition transcript.

25 MR. BROMLEY: If I may?

1 HEARING OFFICER: Yes.

2 MR. BROMLEY: Thank you.

3 Q. (BY MR. BROMLEY) Okay. Mr. Barlogi, that is
4 the unsealed -- now-unsealed copy of your deposition
5 transcript. I'd ask you to turn to page 57.

6 Are you on page 57?

7 A. I am.

8 Q. Line 7, I'm going to read.

9 "What are the surface water -- actually, let
10 me ask it this way: What are Twin Falls Canal Company's
11 goals in this methodology proceeding that we're in?"

12 That's lines 7 through 10.

13 MR. THOMPSON: I'll object to that.

14 Are you reading the deposition, or are you
15 making up the question as you go?

16 What does it say, Chris?

17 MR. BROMLEY: I'm reading the deposition,
18 Travis. Do you have the deposition transcript in front
19 of you?

20 MR. THOMPSON: You said "Surface Water
21 Coalition."

22 MR. BROMLEY: Travis, do you want to read it
23 with me right here?

24 MR. THOMPSON: You changed it. I'm just
25 curious --

1 MR. BROMLEY: No, Travis. I'm reading what
2 the deposition transcript says. Why don't you come here
3 and look at it with me.

4 MR. THOMPSON: No, that's fine.

5 HEARING OFFICER: All right.

6 MR. THOMPSON: I thought you said "Twin Falls
7 Canal Company."

8 HEARING OFFICER: So do we have --

9 MR. BROMLEY: Travis --

10 HEARING OFFICER: -- an objection?

11 COURT REPORTER: Hey, guys --

12 HEARING OFFICER: Do we have an objection?

13 MR. BROMLEY: Come read it.

14 Q. (BY MR. BROMLEY) Do you see, Mr. Barlogi --
15 Sorry, Director.

16 HEARING OFFICER: I'm assuming the purpose of
17 these questions are to either to refresh the memory of
18 the witness or to impeach the witness, one or the other.

19 MR. BROMLEY: One or the other.

20 HEARING OFFICER: So let's read directly from
21 the deposition.

22 MR. BROMLEY: That's what I'm doing, Director.

23 HEARING OFFICER: Okay. I don't have it in
24 front of me, so I'm just, again, reminding you.

25 Q. (BY MR. BROMLEY) So, Mr. Barlogi, let's look

1 at line 7, page 57. And let's read along.

2 "Question: Okay. That's fine. What are the
3 surface water -- actually, let me ask it this way: What
4 are Twin Falls Canal Company's goals in this methodology
5 proceeding that we're in?"

6 Would you please read your answer on line 14?

7 A. On line 14, I said: "I don't believe we have
8 any goals" --

9 Q. Thank you.

10 A. -- "I don't believe it's our work."

11 But that is not the question that you asked
12 me.

13 Q. So the question I asked you are what are the
14 goals of Twin Falls Canal Company, which is --

15 A. In the surface water delivery call, that's the
16 question you asked me here today.

17 Q. I'm asking you what Twin Falls Canal Company's
18 goals are in this proceeding.

19 You just stated to me that you did not recall
20 me asking you that question.

21 A. Because you didn't ask me -- you asked me what
22 are the Twin Falls Canal Company's goals in the Surface
23 Water Coalition call -- or in the -- you didn't ask me
24 the same question that's in my transcript.

25 Q. So let's ask you that same question again

1 that's in the transcript.

2 What are your goals?

3 A. We don't have any goals. The methodology is
4 not our product.

5 Q. Okay. So since Twin Falls Canal Company has
6 no goals in the delivery call and since Twin Falls Canal
7 Company doesn't know how many acres it's irrigating, how
8 is it reasonable for Twin Falls Canal Company to curtail
9 groundwater rights?

10 MR. THOMPSON: Objection; argumentative.

11 HEARING OFFICER: This is cross-examination.
12 I'll allow the question to stand.

13 THE WITNESS: Again, you said we don't have
14 any -- in the delivery call -- we do have goals in the
15 delivery call. This is the methodology. That's not the
16 question that I answered. The question is related to
17 the surface water delivery call.

18 Q. (BY MR. BROMLEY) I would say it's one and the
19 same.

20 Let's move on to the --

21 A. I would disagree.

22 MR. FLETCHER: I object. That's not a
23 question, that's a statement. This is getting
24 argumentative.

25 HEARING OFFICER: Okay. Well, let's move on.

1 MR. BROMLEY: I was moving on, Director.

2 HEARING OFFICER: Good.

3 Q. (BY MR. BROMLEY) Mr. Barlogi, I'd like to
4 talk about Murtaugh Lake. You had mentioned that in
5 your direct testimony again, with Counsel, this morning
6 about how the system works.

7 Do you recall talking about Murtaugh Lake in
8 your deposition?

9 A. I do.

10 Q. And you mentioned this morning -- you called
11 it a "re-regulating reservoir." You also mentioned
12 that -- some "recharge."

13 So when did Twin Falls Canal Company begin
14 recharging in Murtaugh Lake?

15 A. So I'm going to guess. I think -- I think
16 last year was, I want to tell you, maybe our eighth or
17 ninth year of recharge. So I would say somewhere
18 around, yeah, 2015-ish.

19 Q. Okay. So after we talked at your deposition,
20 I went back and looked at the water right records of the
21 Department just to see what the water right was that was
22 going to go along with this recharge project. And what
23 I found was a filing in 2020 that's numbered 45-14537.
24 And that's an application filed by the company for
25 recharge.

1 Does that sound about right?

2 A. Yeah. That's over my head. I don't --

3 Q. So let me hand you, Mr. Barlogi --

4 MR. BROMLEY: Director, if I might?

5 HEARING OFFICER: Yes.

6 MR. BROMLEY: So I think we're at Exhibit 363.

7 Andrea, is that --

8 MS. KLAHN: 362.

9 MR. BROMLEY: 362?

10 MS. KLAHN: I don't think that -- yeah.

11 MR. BROMLEY: Okay. That one was -- you
12 attempted to --

13 MS. KLAHN: Yeah, it wasn't in.

14 MR. BROMLEY: Okay. Should we mark this 362,
15 then?

16 Let me mark this as 363.

17 (Discussion off the record.)

18 (Exhibit 363 marked.)

19 Q. (BY MR. BROMLEY) Just take a moment to
20 familiarize yourself with that document, Mr. Barlogi.

21 A. Okay.

22 Q. All right. So I see when I look at this that
23 it's an application for groundwater recharge. I see
24 that in line 5.

25 Do you see that?

1 A. Yes.

2 Q. Okay. And it's from a source of Dry Creek, a
3 tributary to the Snake River, in line 3?

4 A. Yes.

5 Q. Okay. And is this what we were talking about?
6 This is likely the recharge right that you're using?

7 A. I think this recharge right came into play
8 with it. I think we used Idaho Water Resource Board
9 water right to recharge with.

10 Q. Okay. It's a document you filed with the
11 Department for recharge, though; correct?

12 A. Yes.

13 Q. And I see on page 2 that you signed it?

14 A. Yes.

15 Q. That's your signature?

16 Do you know how much water is lost to seepage
17 at Murtaugh?

18 A. I do not, off the top of my head, no. I mean,
19 it is -- it is accounted for every year with the Idaho
20 Water Resource Board recharge program.

21 Q. Okay. And I know, from experience with the
22 board, that they're pretty particular about where they
23 recharge. So I would assume it's probably a good amount
24 that's lost, do you think?

25 A. Yeah, I think it's significant or they

1 wouldn't support it.

2 Q. So I see Dry Creek is listed as the source for
3 this right; correct?

4 A. Yes.

5 Q. And I looked on a map, because I wasn't real
6 familiar with the area, but what I was seeming to see is
7 it looks like there's another source that comes in which
8 is called Big Cottonwood Creek?

9 A. News to me.

10 Q. Okay. Yeah, the map had something coming in
11 called Big Cottonwood Creek. If you don't know about
12 it, I don't either.

13 Okay. And at your deposition, Mr. Barlogi,
14 you said that since you've been recharging and when
15 Twin Falls turns on for the irrigation season, you
16 haven't had to fill Murtaugh in some years.

17 Do you recall that?

18 A. Yes.

19 Q. So Murtaugh, then, is -- it's filling with
20 water from Dry Creek, some of that water is for
21 irrigation, but then because Murtaugh Lake is filled
22 when the irrigation season is starting in some of those
23 years, that Dry Creek water is being used for
24 irrigation; correct?

25 A. Yeah, I suppose so.

1 Q. There isn't a bypass channel around
2 Murtaugh Lake from Dry Creek, is there?

3 A. No.

4 Q. So let's turn to page 2 of this document.

5 And I see in line 11, you say "see Attachment
6 A" in a few places; and line 12, you see "Attachment A"
7 in a few places.

8 Do you see that?

9 A. I do.

10 Q. Great.

11 So then when I go into Attachment A, and I go
12 to the page that has some -- it's the second page in, so
13 the first page of Attachment A looks like a legal
14 description table. And then the second page, I see
15 No. 10, "Supplemental Information," "11a & c,
16 Supplemental Information."

17 Do you see that?

18 It would be on page 4 of the paper.

19 Yeah, there you go.

20 A. Okay.

21 Q. So in "11a & c Supplemental Information,"
22 three lines down, I see that it stated, "Twin Falls
23 Canal Company as part of Carey Act filing 1900 that
24 allowed for construction of these facilities."

25 Do you see that?

1 A. Yes, 11a & c.

2 Q. And then the page after that, there's a map of
3 Murtaugh Lake; is that what that is?

4 A. Yes.

5 Q. And then the page after that, I see a document
6 that's called "Contract."

7 Do you see that?

8 A. Yes.

9 Q. Okay. And this was attached by you to this
10 document seeking a recharge water right at Dry Creek.

11 So on the -- and read to me what it says at
12 the top of that document.

13 A. Of the contract?

14 Q. Yes.

15 A. It says: "Between State Board of Land
16 Commissioners and Twin Falls Land & Water Company dated
17 January 2nd, 1903."

18 Q. Thank you.

19 So I see a few headings on this first page.
20 And then when I turn to the second page, I see some more
21 headings -- the "Price of Water Rights" is one, "Water
22 Right Dedicated" is another -- and I'd like to talk
23 about the "Water Right Dedicated" piece.

24 And because that's pretty small font -- my
25 eyes are getting worse the more of these that I do -- I

1 made a copy of -- trying to increase this so that people
2 can read it.

3 HEARING OFFICER: So, Mr. Bromley, I'm trying
4 to manage time a little closer today. How much longer
5 do you have with Mr. Barlogi?

6 MR. BROMLEY: This is my last set of
7 questions.

8 HEARING OFFICER: Okay. All right. Great.

9 MR. BROMLEY: Just five minutes, maybe.

10 HEARING OFFICER: Great.

11 (Exhibit 364 marked.)

12 Q. (BY MR. BROMLEY) Okay. Do you have
13 Exhibit 364, Mr. Barlogi?

14 A. I do.

15 Q. Is that easier to read?

16 A. Yes.

17 Q. It is for me, too.

18 So let's look at this "Water Right Dedicated,"
19 and let's break it into parts. So starting at the word
20 "Ninth."

21 Do you see that?

22 A. I do.

23 Q. And then from "Ninth" there's a colon, and
24 then there's another colon after the word "to-wit."

25 Do you see that?

1 A. Yes.

2 Q. Okay. So at that second colon right after
3 "to-wit," let's read from there. So starting with "One
4 eightieth."

5 A. Okay.

6 Q. And would you read starting at "One
7 eightieth"?

8 A. [As read] "One eightieth of a second foot
9 allotted to each acre represented thereby, and carrying
10 capacity of the canal sufficient thereof."

11 Q. Okay. So I'll represent to you that one
12 eightieth of a cfs is the equivalent of five-eighths of
13 a miner's inch.

14 So right after, then, you ended at "therefor."
15 That was a perfect place to stop. Would you read from
16 "the water to be delivered"?

17 A. "The water to be delivered from the canal
18 during each and every irrigation season, said amount to
19 be measured at or within one half-mile of the place of
20 intended use in such quantities and at such times as the
21 condition of the soil, crops and weather may determine
22 but according to such rules and regulations based upon a
23 system of distribution of water to the irrigators in
24 turn and by rotation as will be best" -- "as will best
25 protect and serve the interests of all users of water

1 from this canal system."

2 Q. Okay. And then read that last sentence, and
3 that's the last of it I'd like you to read.

4 A. "It is agreed that said system of distribution
5 by rotation shall be devised by the said party of the
6 second part and used by it during the period while it
7 retains the management of said system, and that it shall
8 meet the approval of the State Engineer."

9 Q. Okay. Thank you, Mr. Barlogi.

10 So is the company measuring from one half --
11 or I should say at or within a half-mile of the place of
12 intended use? Is that where you measure?

13 A. Yeah. Yeah. I would say by and large, yes,
14 almost exclusively, yes.

15 Q. Great.

16 And then as to this system of rotation that
17 you've stated and that you read in the last sentence,
18 the company is not rotating; correct?

19 A. Well, I believe we are rotating. I would say
20 this document was prepared in 1902. In 1902, a typical
21 farm was 40 or 80 acres. That's not the case anymore.
22 These farmers have all bought up the neighbors' farms
23 and bought up the neighbors' farms to where the typical
24 farm is now 800, 1,000 acres of those farms that,
25 historically, per this document, were 40-acre farms, and

1 they are now rotating amongst all of those 40-acre
2 farms. But it does all exist within one farm.

3 Q. And when we looked at -- well, let me say it
4 this way: When we started at the beginning, maybe a
5 little ways in, when I asked you how much water
6 Twin Falls Canal Company is delivering this season, you
7 said three-quarters of an inch; correct?

8 A. Yes.

9 Q. That's more than five-eighths?

10 A. Yes. I would also suggest that the time that
11 this document was prepared, the system was envisioned to
12 encompass 240,000 acres. That didn't come into
13 fruition, but that's what we were decreed for, was the
14 water for the 240,000. Since then we are down to 194;
15 so, arguably, there's some balance there between
16 five-eighths and three-quarters.

17 MR. BROMLEY: We could have some further
18 discussion about the contract, but I'm going to leave it
19 there, Director.

20 I would then move for the admission of these
21 last two exhibits that we've discussed --

22 363 and 364, Andrea?

23 HEARING OFFICER: Any objection to the
24 admission of these documents?

25 The documents marked as -- and, again, correct

1 me -- 363, is that correct, and 364, Mr. Bromley?

2 MR. BROMLEY: That is correct, Director.

3 HEARING OFFICER: -- are received into
4 evidence.

5 (Exhibits 363 and 364 received.)

6 MR. BROMLEY: And then the one other one that
7 I have on my list, just to clean up, is 337.

8 These were the letters, Mr. Barlogi, that we
9 looked at that your counsel has sent in to the
10 Department over the years as the irrigated area under
11 Step 1 of the Methodology Order.

12 Director, I would offer those at this time.

13 HEARING OFFICER: Any objection to the
14 admission of these documents?

15 Okay. The documents or document marked as
16 Exhibit 337 is received into evidence.

17 (Exhibit 337 received.)

18 MR. BROMLEY: I have nothing further. Thank
19 you.

20 HEARING OFFICER: Thank you, Mr. Bromley.

21 MR. BROMLEY: Thank you, Mr. Barlogi.

22 HEARING OFFICER: Let's break for 15 minutes.
23 Let's come back at five to the hour.

24 (Break taken.)

25 HEARING OFFICER: We're back recording.

1 Okay. Next examiner, Mr. Bricker. Go ahead.

2 MR. BRICKER: Thank you, Director.

3
4 CROSS-EXAMINATION

5 QUESTIONS BY MR. BRICKER:

6 Q. Hello, Mr. Barlogi.

7 A. Hello.

8 Q. Nice to meet you -- or to see you in person.

9 I want to begin with some return flows. So
10 does Twin Falls Canal Company track the entirety of its
11 diversions that return to the Snake River above ground
12 surface; in other words, spill back into the river?

13 A. Yes, in a manner of speaking.

14 Q. And the amount of the company's spills haven't
15 significantly changed since 2010, have they?

16 A. No.

17 Q. Now, if the company were to take measures to
18 reduce the amount of spills, thus, using that water
19 before it leaves the system, couldn't the company
20 thereby reduce its diversions?

21 A. Well, I think we do take measures to limit the
22 amount of water that goes over those spills to the best
23 extent possible. Operational spill is required at the
24 ends of all of those laterals.

25 Q. Are there further measures that could be taken

1 to reduce them further?

2 A. If there are and we haven't already undertaken
3 those measures, it's because we haven't identified them
4 yet, and we certainly would if we saw them. We do
5 everything we can to minimize the amount of spill.

6 Q. Fair enough.

7 All right. Does Twin Falls Canal Company want
8 the Fifth Methodology Order to accurately represent its
9 reasonable in-season demands?

10 A. Well, certainly, I would think so.

11 Q. Can we pull up Exhibit 1, that's your prefiled
12 testimony. And while we're at it, also Exhibit 300,
13 which is the Fifth Methodology Order.

14 So beginning with your prefiled testimony, can
15 you please turn to page 27 of Exhibit 1.

16 A. Okay.

17 Q. On lines 8 to 14 therein, you state that the
18 company's diversions have stayed around
19 1,100,000 acre-feet per year over the last 30 years;
20 right?

21 A. Yes.

22 Q. But that's not consistent with the data
23 presented in the Fifth Methodology Order on page 12, is
24 it?

25 MR. THOMPSON: I guess I'll object to the form

1 of the question as those two pieces of information
2 representing the same time periods. I don't think they
3 do.

4 HEARING OFFICER: Well, I'll at least sustain
5 the objection.

6 Mr. Bricker, just asking for more foundation,
7 looking at the information in the Methodology Order.

8 MR. BRICKER: Sure.

9 Q. (BY MR. BRICKER) So isn't it true that the
10 company's diversions from 2000 to 2021 averaged
11 1,062,098 acre-feet?

12 A. I assume so. I haven't done that math myself,
13 but that's what the document says.

14 Q. And that number is, roughly, 38,000 acre-feet
15 less than what you claim the company's annual diversions
16 to be around?

17 A. No, I don't believe that's accurate. I
18 believe I clearly state that it is right around
19 1.1 million. Some years a little less; some years a
20 little more.

21 Q. Okay. But the Fifth Methodology Order states
22 that the average diversions are 1,062,098 acre-feet?

23 A. Okay.

24 Q. Thank you.

25 Now, isn't it true that the Department uses

1 the company's 2018 diversions as the baseline in
2 predicting the company's reasonable in-season demands?

3 A. You've got to restate that. Say it again.

4 Q. Isn't it true that the Department uses the
5 company's 2018 diversions as the baseline for the
6 company's reasonable in-season demand?

7 A. I believe that's accurate.

8 Q. Isn't it true, on page 12, that the company's
9 baseline year demand under the Fifth Methodology is
10 1,121,717 acre-feet?

11 A. That's what it says in the book, yes.

12 MR. BRICKER: Can we pull up Exhibit 306,
13 please.

14 Q. (BY MR. BRICKER) Do you have it?

15 A. Yes, sir.

16 Q. Also on page 12, please.

17 Isn't it true that the company's baseline year
18 demands under the Fourth Methodology Order were
19 quantified as 1,060,011 acre-feet?

20 A. Yes, sir.

21 Q. Isn't it also true that the company's baseline
22 year demands under the Second Methodology Order were
23 quantified as 1,045,382 acre-feet?

24 MR. BRICKER: And I realize this is not in an
25 exhibit before us, but I would ask the Director to take

1 official notice of that Second Methodology Order.

2 HEARING OFFICER: I don't have it in front of
3 me, Mr. Bricker. It certainly is part of the record.
4 So whatever numbers are there, you know, I'll review if
5 there's a need to do it.

6 Q. (BY MR. BRICKER) Well, I will represent to
7 you that under the Second Methodology Order Twin Falls
8 Canal Company's baseline year demands were quantified as
9 1,045,382 acre-feet.

10 Do you have any reason to deny that?

11 A. No.

12 Q. So isn't it true that the Department has
13 increased Twin Falls Canal Company's baseline year
14 demand by over 76,000 acre-feet since the Second
15 Methodology Order?

16 I can read the numbers to you again if you'd
17 like.

18 A. Well, I mean, I'll agree. That is somewhere
19 around where the difference between those two numbers
20 is, yes.

21 Q. Great. And the Department -- excuse me.
22 Let's turn to Exhibit 301, page 3.

23 Isn't it true that the Department is
24 predicting a shortfall for Twin Falls Canal Company in
25 the magnitude of 75,200 acre-feet in 2023?

1 A. Yes.

2 Q. Isn't it also true that under the Second
3 Methodology Order there would not be a shortfall
4 predicted in this year, assuming that same baseline year
5 demand?

6 A. I assume so. I have not done that math, I
7 guess. I assume so.

8 Q. Great. Now, you've stated in your deposition
9 that everything Twin Falls Canal Company does is in the
10 interest of efficiency; is that correct?

11 A. Yes.

12 Q. And you've also stated that Twin Falls Canal
13 Company's operations have absolutely become more
14 efficient in the last two decades; correct?

15 A. Yes.

16 Q. And that's because the company has undertaken
17 many projects, including lining canals and implementing
18 automation into its operations; right?

19 A. Yes. Among other things.

20 Q. Turn back to Exhibit 300, please.

21 And I don't know if it's possible, but could
22 you also have Exhibit 306 side by side?

23 MR. WOOD: What is the one that you want?

24 MR. BRICKER: Exhibit 300 and Exhibit 306.

25 MR. WOOD: What page?

1 MR. BRICKER: Page 14 in both.

2 MR. WOOD: Page 14?

3 MR. BRICKER: Correct, in both.

4 MR. WOOD: So here will be 306.

5 Q. (BY MR. BRICKER) Have you got those,
6 Mr. Barlogi?

7 A. I do.

8 Q. Okay. So isn't it true that your assertion
9 that Twin Falls Canal Company's project efficiencies
10 have increased is not consistent with the difference
11 between Twin Falls Canal Company's project efficiencies
12 shown in the Fourth Methodology Order and the Fifth?

13 A. No, I don't, necessarily, believe that is
14 true.

15 Q. If you look at those two tables, is Twin Falls
16 Canal Company's project efficiency .35 in both?

17 A. Yes, it is.

18 Q. Thank you.

19 As we discussed a few minutes ago, the
20 Department has predicted that the canal company will
21 experience a shortfall in 2023; correct?

22 A. Yes.

23 Q. And the Department has predicted shortfalls in
24 past years as well; correct?

25 A. Yes.

1 Q. Now, in your deposition, isn't it true you
2 stated that it is not common for Twin Falls Canal
3 Company shareholders to forgo planting crops because of
4 a lack of water supply?

5 A. Yeah, I don't know if I said it quite that way
6 or not. I would say that, typically, we have -- in my
7 lifetime at the canal company, we have had more good
8 water years than bad ones.

9 So, yeah, certainly. Typically, they don't
10 forgo planting the crops that they would like to plant
11 because, typically, we have a decent water supply.

12 Q. And, similarly, you've stated that you are not
13 familiar with crops perishing within the canal company's
14 project area because of inadequate water supply;
15 correct?

16 A. No, I'm not.

17 Q. Could you turn to Exhibit 314, please. That's
18 going to be page 224.

19 A. Okay.

20 Q. Do you see line 18 says, "I'm not familiar
21 with crops perishing"?

22 A. Yes.

23 Q. Thank you. A few more questions.

24 You have stated that you haven't experienced
25 Twin Falls Canal Company shareholders idling their land;

1 correct?

2 A. Yes.

3 Q. You also stated that there's typically a
4 zero percent change in TFCC's irrigated acreage;
5 correct?

6 A. Yes.

7 Q. So that must mean that the company must be --
8 the project area of the company must be planted wall to
9 wall, then, each year; right?

10 A. No.

11 Q. Can the company ascertain when certain lands
12 are not irrigated in a given year?

13 A. Well, certainly, I think -- I think we would
14 know, yes.

15 MR. BRICKER: Thank you.

16 No further questions, Director.

17 HEARING OFFICER: Okay. Thank you,
18 Mr. Bricker.

19 Further questions, Mr. Budge?

20 MR. BUDGE: Thank you, Director.

21

22 CROSS-EXAMINATION

23 QUESTIONS BY MR. BUDGE:

24 Q. And thank you, Mr. Barlogi, for being here
25 today.

1 Do you mind if I call you "Jay"?

2 A. No, that's fine.

3 Q. Jay, I'm going to try to avoid duplicating
4 other questions you've been asked, but I do have a
5 little overlap just because I want to clarify a few
6 items.

7 First, you testified earlier about different
8 delivery rates of the company, three-quarters of an inch
9 per share and five-eighths-inch delivery.

10 I just want to clarify, that's per share of
11 stock?

12 A. Yes.

13 Q. Twin Falls Canal Company does not deliver
14 water on a per-acre basis; it's a per-share basis?

15 A. Yes.

16 Q. And I understand from your direct testimony,
17 there's 202,690 total outstanding shares in the company?

18 A. Yes.

19 Q. And if we've got somewhere between 180- and
20 194,000 irrigated acres, we end up with somewhere around
21 1.1 share per acre on average?

22 A. Okay.

23 Q. In your prefiled testimony, you discussed the
24 challenges that development is causing for your company,
25 specifically the changes of farmland from ag into

1 residential, commercial, and industrial use.

2 Do you remember that part of your testimony?

3 A. Yes.

4 Q. This is something I'm sure you've witnessed
5 firsthand during your time with the company?

6 A. Yes.

7 Q. And you're personally familiar with farmland
8 that used to be irrigated that now has got commercial or
9 industrial development on it?

10 A. Of course.

11 Q. Has this transition happened relatively
12 continuously during your time with the company?

13 A. No -- well, yes, at some level there's always
14 been something going on. Certainly, in the earlier
15 years very little. In the last couple of years, as the
16 economy has been so fluid, a lot more.

17 Q. Okay. So probably fair to say it's
18 accelerated in the last decade or so?

19 A. Fair.

20 Q. I understand Twin Falls Canal Company has
21 three irrigation water rights. The water right numbers
22 on file with the Department are 1-209, 1-4, and 1-10.

23 Are you familiar with those water right
24 numbers?

25 A. No, I'm not.

1 Q. Maybe what I'll have you do, Jay, is turn
2 briefly to Exhibit 184.

3 A. Okay.

4 Q. And you can take a moment just to briefly
5 review that document and the attachments.

6 Jay, have you had a chance to review that?

7 A. Yeah, briefly.

8 Q. That's a document filed in the Snake River
9 Basin Adjudication. There's a joint stipulation to
10 withdraw objections, and then there's some water right
11 recommendations for Water Right Nos. 1-4, 1-10, and
12 1-209.

13 A. Okay.

14 Q. Do you recognize those as Twin Falls Canal
15 Company's irrigation water rights from the Snake River?

16 A. These are our natural flow water rights from
17 the Snake River, yes.

18 Q. Okay. And you understand that, collectively,
19 those three water rights authorize the irrigation of
20 196,162 acres?

21 A. No, I don't know that, but...

22 Q. Okay. If you'll look at the second page of
23 the exhibit, which is part of the stipulation, there's
24 paragraph 3(a), and it reads, "Evidence relating to
25 water right use after November 19th, 1987, was not at

1 issue in the adjudication. These water rights are
2 decreed in the Snake River Basin Adjudication based on
3 the extent of beneficial use that existed prior to or at
4 the time of the commencement of the Adjudication on
5 November 19th, 1987.

6 Do you see that?

7 A. I do.

8 Q. Do you understand that the decrees issued by
9 the SRBA are based on the extent of irrigation in 1987?

10 A. Yes.

11 Q. And you would agree that there's been a
12 significant number of acres removed from irrigation
13 since that time?

14 A. No -- well, yes, significant is somewhat
15 relative, but I would say that certainly for some of
16 these industrial complexes, they retained 25 percent of
17 their water shares, and the other 25 -- or the other
18 75 percent were transferred to otherwise drylands.

19 Q. Okay. So as development has occurred, some
20 land has been taken out of production, and some shares
21 have been transferred to other farmers?

22 A. Yes.

23 Q. I understand.

24 I think you went over some of this with
25 Mr. Bromley, but I just wanted to make sure it's clear

1 for me in the record. Twin Falls Canal Company does not
2 maintain a record of the number of irrigated acres that
3 it delivers water to annually?

4 A. No.

5 Q. So when farmland is developed or removed from
6 production, there's not some book or other database that
7 the company maintains to, you know, reflect that land
8 being taken out of production?

9 A. Say that again, TJ.

10 Q. When farmland is developed and taken out of
11 production, the company doesn't maintain any type of
12 database where it keeps track of that land being taken
13 out of production?

14 A. You know, I would suggest that some of that is
15 likely in the Magic program that I talked about before.
16 I'm not intimately familiar with the Magic program, but
17 I do know that, you know, section-township-range
18 information is there. So if we transfer water from one
19 area to another, that certificate reflects that new
20 section, township, and range. I believe you will find
21 that in the Magic program as well.

22 Q. So you've got something that shows that -- if
23 shares move from one delivery point to another?

24 A. Certainly, we track the shares.

25 Q. But you're not tracking the acres being taken

1 out of production?

2 A. No.

3 Q. Some Surface Water Coalition members maintain
4 a GIS shapefile that they update annually with irrigated
5 acres. That's not something that Twin Falls Canal
6 Company does?

7 A. No.

8 Q. If you could turn to Exhibit 300 -- that's the
9 Fifth Methodology Order -- and when you get there, flip
10 to page 9.

11 A. Okay.

12 Q. Jay, have you read the Fifth Methodology Order
13 before?

14 A. Yes.

15 Q. On page 9, there's a heading near the bottom
16 titled "Irrigation Practices"?

17 A. Yes.

18 Q. And below that, there's a paragraph 19
19 referring to the baseline year, and it says, "A baseline
20 year must be recent enough to represent current
21 irrigation practices. Current conditions should be
22 represented by (a) the net area of irrigated crops," and
23 then I won't read the rest.

24 Do you understand that the methodology
25 utilizes irrigated acreage to calculate water demand for

1 Twin Falls Canal Company?

2 A. Yes.

3 Q. You understand that if Twin Falls Canal
4 Company reports to the Department more irrigated acres
5 than are actually irrigated, then the methodology will
6 calculate more water demand than if the correct number
7 of acres were used?

8 A. Yes.

9 Q. And that this will result, in turn, in
10 additional curtailment of groundwater users or
11 additional mitigation being required of groundwater
12 users?

13 A. Yes.

14 Q. So you understand that having -- the
15 Department having accurate acreage figures is very
16 important to ensure that the Department does not impose
17 excess curtailment?

18 A. Yes, I do.

19 Q. Okay. And you understand that groundwater
20 users don't have access to Twin Falls Canal Company's
21 water delivery database?

22 A. Yes.

23 Q. Okay. So you understand that groundwater
24 users have to trust that Twin Falls Canal Company will
25 provide accurate acreage data to the Department?

1 A. Yes.

2 Q. And I believe you testified earlier that you
3 don't think the irrigated acres within Twin Falls Canal
4 has varied by more than 5 percent since the 2013 figure?

5 A. Yes.

6 Q. But there's not a mechanism in place to track
7 total irrigated acres with the company?

8 A. No.

9 Q. So in the future if it exceeds that threshold,
10 the company won't really know when that happens?

11 A. Well, I disagree with that. I believe we
12 would know. It's a large enough number that we
13 certainly would know. The reason we haven't created
14 shapefiles in recent years is because we know for
15 certain that we are within the 5 percent very, very
16 easily.

17 Q. And how do you know that for certain?

18 A. Again, as I represented earlier, 5 percent of
19 194,000 is nearly 10,000 acres, nearly 15 square miles.
20 Nothing close to that has happened.

21 Q. Let me reference -- I'm going to switch gears
22 here and reference a portion of your prefiled testimony
23 that talks about crops grown within the company's
24 service area.

25 And you mentioned there's wheat, barley,

1 alfalfa, sugar beets, potatoes, dry beans, and corn.

2 I assume those are the primary crops?

3 A. Yes.

4 Q. Anything else would be on a small scale?

5 A. I'm sorry, I wasn't tracking everything that
6 you said.

7 Q. Yeah. There may be some other greenhouse-type
8 crops or something grown, but they would be very small?

9 A. Yes.

10 Q. What's your best estimate as to the percentage
11 of the company's service area, on average, that's used
12 to grow wheat and barley?

13 A. I don't have any idea.

14 Q. Is it a significant portion?

15 A. Yeah, yeah, I would say so.

16 Q. And I'm not a farmer, but I understand those
17 crops are typically harvested in early August?

18 A. Yeah, I'm not a farmer either, but, yeah, I
19 think you're right.

20 Q. And so when those crops are harvested, there
21 would be a drop in irrigating acreage within the
22 company's service area?

23 A. Not necessarily.

24 Q. Do those acres that were growing barley and
25 wheat continue to be irrigated after they're harvested?

1 A. To some extent they do. A lot of times, the
2 guys will irrigate the stubble to assist in the soil
3 health to help the stubble break down. In recent years,
4 we've seen some double cropping going on on the project.
5 Furthermore, those acres that were under barley, that
6 water has probably now been moved off of those acres and
7 rotated around to the sugar beet crop or to the alfalfa
8 crop or to the corn crop.

9 Q. Is it fair to say that the amount of
10 irrigation that was occurring -- that occurs on wheat
11 and barley acres declines on those acres collectively
12 after those crops are harvested?

13 A. Yeah, I would say after a period of time, you
14 know. Commonly during that time of year, every crop out
15 there is needing water. So when the grain crops are
16 done, it's very, very common for two or three weeks to
17 see water users attempt to get caught up in areas where
18 they were behind.

19 Once they begin to get caught up, if they had
20 enough grain on their farm, you will see them reduce
21 their delivery.

22 Q. And you explained earlier that the company
23 doesn't do rotations, but individual stockholders can
24 rotate their water supplies among their different fields
25 on their farm?

1 A. Yes.

2 Q. Do most farmers take their diversion rate
3 continuously through the irrigation system but have that
4 type of rotating you discussed earlier?

5 A. Yes, more or less.

6 Q. And I understood from your deposition that the
7 company, typically, delivers water from mid-April to
8 mid-October?

9 A. We, typically, have water available for
10 delivery from mid-April through mid-October, yes.

11 Q. And I understood from your deposition
12 testimony that stockholders tell you in the spring when
13 they're ready to turn on, and they tell you in the fall
14 when they're ready to turn off?

15 A. Yes.

16 Q. I understand that Twin Falls Canal's water
17 supply depends primarily on natural flow?

18 A. Yes.

19 Q. And when natural flow is sufficient to divert
20 the full authorized diversion rate, I assume the
21 company's going to take its full rate?

22 A. Well, likely. Likely -- I say that because,
23 you know, 170 -- 170 cfs of our water right is a 1939
24 water right. And that water right is never available
25 when you get into July, which leaves us at 3,600 cfs

1 with a 1915 of 600 and a 1900 of 3,000. So, typically,
2 our system maxes out at 3,650. So throughout the June,
3 July, and August period, you can expect to see those
4 kinds of numbers with our diversion; and if the natural
5 flow will sustain that, absolutely, we will divert it
6 and need it.

7 Q. Yeah. Okay.

8 I assume from a canal management standpoint,
9 it's easier to manage the system and get water to
10 everybody with the full 3,600 cfs diversion than if you
11 had to cut back to 3,000 or something like that?

12 A. Yeah, certainly. Yes.

13 Q. You testified a little bit today and in your
14 deposition about all the work Twin Falls Canal Company
15 has done to make its system more efficient.

16 A. Yes.

17 Q. In your deposition, you explained that you've
18 installed a lot of automation. I think you mentioned
19 there were 60 automated sites now within the company?

20 A. Yes, ballpark.

21 Q. You explained that the Kinyon Pond was
22 constructed in 2012 or '13, which enables you to manage
23 the water supply more efficiently?

24 A. Yes.

25 Q. You described a large canal lining project on

1 the High Line Canal in 2019?

2 A. Yes.

3 Q. And two large-scale projects -- lining
4 projects planned for 2023 and 2024?

5 A. I think we have one planned, not two.

6 Q. Oh, one planned. Okay. I may have
7 misunderstood that.

8 And you also explained that if funding were
9 available, Twin Falls Canal would develop additional
10 project efficiencies?

11 A. We are always looking for opportunities.

12 Q. And so if groundwater users were willing to
13 fund an engineering study to identify additional
14 efficiencies available to the company, is that something
15 you would welcome?

16 A. I wouldn't say we would at this point, no.

17 Q. If groundwater users were to fund actual
18 improvements that had been identified, would you welcome
19 their support?

20 MR. THOMPSON: I'm going to object to this
21 line of questioning going beyond the scope of this
22 proceeding, relevance.

23 HEARING OFFICER: Mr. Budge?

24 MR. BUDGE: I think it's well within the scope
25 of the proceeding.

1 HEARING OFFICER: Well, I'm torn, but I think
2 I'll sustain the objection, Mr. Budge.

3 Q. (BY MR. BUDGE) Let me ask just a few
4 follow-up questions about sprinkler efficiencies.

5 I think we covered some of this, but if I
6 understood correctly, the company's gone from about
7 25 percent sprinkler to 50 to 60 percent sprinklers in
8 the last 10 or 20 years?

9 A. That's our current estimate, yes.

10 Q. And when shareholders irrigate with
11 sprinklers, they divert less water from the canal?

12 A. No.

13 Q. They apply just as much water per acre with
14 sprinklers as they did with flood irrigation?

15 A. As I mentioned earlier, I'm not a farmer, I
16 don't really know how they apply at all. I know that we
17 continue to deliver the same amount.

18 I think on-farm efficiencies are certainly
19 there. I think they have the ability to water their
20 crops more efficiently, make better use of the water on
21 the farm, and then move that water around to other
22 crops.

23 Bear in mind, on our system one farmer is not
24 growing just one great big hayfield. He's got
25 hayfields. He's got cornfields. He's got grainfields.

1 So he may be able to more efficiently move his water
2 around on his farm, but he still has a right, and we
3 still deliver the same amount.

4 Q. You testified at your deposition that with the
5 conversion from flood to sprinkler, there's less water
6 that's accruing to waste ditches throughout the company?

7 A. Yes. Actually, I -- yeah, you know, the
8 on-farm improved efficiencies, I believe, are there.
9 The on-system efficiencies suffer.

10 Q. So when you say you deliver the same amount,
11 what you're saying is you're making available to the
12 stockholder the same amount of water, the three-quarters
13 of an inch or five-eighths of an inch?

14 A. Yes.

15 Q. Does the company maintain meters at each
16 delivery point to regulate how much water is diverted at
17 each diversion point?

18 A. Yes, sir.

19 Q. And do those have totalizers on them?

20 A. Our meters are in the form of a concrete
21 headgate that's measurable. They're not -- they're not
22 electronic meters.

23 Q. You've got measuring devices, but not
24 something that's keeping track of the total volume
25 delivered --

1 A. No.

2 Q. -- each year?

3 Okay. But -- well, let me ask you this: In
4 your prefiled testimony, you have a statement that
5 there's less return flow into the system from flood
6 irrigation, and as a result -- and here's a quote -- "We
7 simply have to bring more water into the system to
8 supply those needs."

9 Do you remember this part of your testimony?

10 A. Yeah, I remember that conversation and
11 multiple parts of my testimony.

12 Q. And I'm referring to your prefiled testimony
13 that's been admitted as Exhibit 1, I believe. And
14 that's page 22, line 20.

15 A. So I would say that following that I believe
16 there's a sentence that says that's simply not possible
17 to just go get more water. We look at efficiencies and
18 canal capacities as virtually synonyms. Our canal
19 capacity doesn't allow us to just continually go to the
20 head and get more and more water.

21 So we've had to become more and more efficient
22 in order to meet with those needs and meet with the
23 deficit that we now experience because we don't receive
24 that wastewater to redeliver time and time again.

25 Q. Now, your testimony is that when somebody

1 converts from flood to sprinkler that wastewater
2 diminishes, but they're diverting just as much onto the
3 fields as they did with flood irrigation?

4 A. Yes.

5 Q. Okay. So with flood irrigation there's water
6 that would discharge into waste ditches. Some of those
7 waste ditches return to the company's system, and others
8 just discharge out of the system; correct?

9 A. Yes.

10 Q. So when somebody converts from flood to
11 sprinkler, and there's less wastewater discharging out
12 of the system, there's no water savings there for the
13 company?

14 A. No. There's a water shortage that exists as a
15 result of that.

16 Q. So converting to sprinkler -- what you're
17 saying is it actually takes Twin Falls Canal Company
18 more water for its patrons to irrigate their crops with
19 sprinkler than with flood?

20 A. No. I'm saying it takes the company a higher
21 level of efficiency to operate with sprinklers versus
22 flood.

23 Q. So less water?

24 A. The same.

25 Q. The same water? No difference?

1 A. Right. 1.1 million.

2 Q. Diverts the same at the head, is what you're
3 saying?

4 A. Yes.

5 Q. So if the whole company was in sprinkler, you
6 would still want to divert the full 1.1 million
7 acre-feet at the head?

8 A. We will strive to improve our efficiencies so
9 that we can do that. As we lose that wastewater, it
10 becomes a challenge.

11 Q. Let me ask you a few questions about
12 subdivisions.

13 You mentioned that subdivisions use as much
14 water as the farmer used before the subdivision went in?

15 A. Yes.

16 Q. In your testimony, your prefiled testimony,
17 you reported that most subdivisions divert most or all
18 of their water between 5:00 and 10:00 a.m.?

19 A. No. I think they use most of their water
20 between that. They divert it constantly.

21 Q. Where does it go when they're diverting it but
22 not using it?

23 A. Back into our system or back into its
24 historical waste path.

25 Q. Okay. So they divert it, they just don't use

1 it to grow landscaping and sod and stuff like that?

2 A. Right.

3 Q. So when you say subdivisions continue to
4 divert just as much as before, the diversion hasn't
5 changed, but the amount of crops grown -- considering
6 sod a crop, that goes down. The amount of -- I'll do it
7 this way: The amount of acres irrigated goes down, but
8 the diversion stays the same?

9 A. Yes. There's hard-surface areas in there that
10 aren't growing a crop.

11 Q. And then additional water comes back into the
12 system through a waste ditch or whatever?

13 A. Yeah, it either comes back into the system or
14 it goes back into a historical waste path and wastes
15 beyond our system into the Snake River Canyon, the
16 Rock Creek Canyon. Or in many cases they have built
17 large storage ponds to store that capacity so that when
18 the sprinklers all fire up at 5:00 o'clock tomorrow
19 morning, there's been capacity built in order to sustain
20 that need.

21 Q. Okay. Very good.

22 I've just got a few more questions, and it's
23 about the hydropower facilities, and you covered some of
24 this with Mr. Bromley.

25 I understand there's three facilities that

1 Twin Falls Canal Company is an owner and part-owner.
2 It's Midway Power, Lower Low Line, and Twin Falls
3 Energy.

4 Are those the three?

5 A. No. It's Midway Power and Lower Low Line we
6 fully own, and we're partners in the South Forks Hydro.

7 Q. That's right. You explained that in your
8 deposition, and I didn't get it straight. I apologize.

9 And then there's another seven plants that are
10 owned by third parties?

11 A. Yes.

12 Q. You testified earlier today that most of these
13 are at the tail end of drains?

14 A. Yes.

15 Q. And on some of the plants that Twin Falls
16 doesn't own, they receive royalties from the third-party
17 owner?

18 A. Yes.

19 Q. And I believe in your deposition you testified
20 that Twin Falls has budgeted \$1.8 million from
21 hydropower revenue in 2023?

22 A. There is that kind of revenue expected, and
23 there are expenses associated with that as well.

24 Q. Okay. And that's just for the three plants
25 that the company has ownership interest in?

1 A. No, I believe that's all of it.

2 Q. That includes the other plants as well?

3 A. I believe so.

4 MR. BUDGE: That's all the questions I've got.

5 Thanks.

6 HEARING OFFICER: Thank you, Mr. Budge.

7 Further questions from the groundwater group?

8 Redirect, Mr. Thompson.

9 MR. ANDERSON: Director, may I ask just one
10 quick question? I'm sorry.

11 HEARING OFFICER: Of whom?

12 MR. ANDERSON: Of Jay. Sorry.

13 HEARING OFFICER: Sure.

14 MR. ANDERSON: Just real quick.

15 HEARING OFFICER: Yep. Come forward.

16 MR. ANDERSON: And I just will be quick.

17

18 CROSS-EXAMINATION

19 QUESTIONS BY MR. ANDERSON:

20 Q. I understand the objection and the sustaining
21 of relevance on the question that was asked about
22 technologies and efficiencies.

23 So my question is not what you would do or
24 what you would allow groundwater districts to do, but I
25 want to ask the question this way: Is there currently

1 factors or barriers to putting in new technologies into
2 your system if those technologies existed?

3 A. No. We explore and entertain any new
4 technology that comes along.

5 That being said, it's not all based -- all
6 that it's cracked up to be.

7 Q. So other than the limitations of the
8 technology itself, probably, there's no other factors,
9 that you can think of, that would limit those
10 technologies going in?

11 A. No.

12 MR. ANDERSON: Thank you. No further
13 questions.

14 HEARING OFFICER: Thank you. Mr. Thompson.

15

16 REDIRECT EXAMINATION

17 QUESTIONS BY MR. THOMPSON:

18 Q. Mr. Barlogi, just a couple of questions on
19 redirect here.

20 Can you turn to Exhibit 1. It should be in
21 our small binder there in front of you.

22 A. Okay.

23 Q. Can you turn to page 22, please.

24 A. Okay. I am there.

25 Q. It's -- in lines 18 to 20 we have an objection

1 from the groundwater users as hearsay.

2 Can you just describe what you're discussing
3 there?

4 A. Yes. I was just discussing the situation that
5 we're talking about. As Twin Falls Canal Company has
6 the opportunity to reuse each drop of water time after
7 time after time as much of our -- all of our High Line
8 ground, about 73,000 acres, wastes back into the
9 Low Line. So all of that wastewater we get to recapture
10 and reuse again. And then we deliver it, then, again,
11 onto Low Line grounds that typically waste off of one
12 farm back into our system. And we get to use it again
13 and again and again.

14 It's part of our efficiency number within the
15 company. And I was just citing a historical statement
16 in one of the old documents of the canal company where a
17 state engineer had made the comment that a drop of water
18 is thoroughly exhausted by the Twin Falls Canal Company
19 by the time they are done with it.

20 Q. So I guess you wouldn't have to rely upon that
21 engineer's statement to know how that operation works?

22 A. No. Of course not, no.

23 Q. And do you also receive water from seeps and
24 drain tiles?

25 A. Yes, sir.

1 Q. And what have you witnessed in regards to
2 those flows, over time?

3 A. Well, seeps and drain tiles were installed
4 originally between, I want to tell you, 1915 and 1930.
5 We captured a huge amount of subsurface water and
6 redirected it back into our system.

7 In recent years, certainly, that water supply
8 has gone down, down, down. And the trajectory is still
9 currently downward. We've seen a reduced amount of that
10 water coming out of those seep tiles and tunnels.

11 Q. You heard some questions this morning about
12 the hydropower projects within the canal company.

13 Does the canal company divert water from the
14 Snake River only for hydropower purposes?

15 A. No. It's explicitly understood amongst all of
16 our stockholders and amongst all of the power folks that
17 those facilities exist incidental to irrigation demand.

18 Q. Can you turn to Exhibit 338.

19 A. I'm there.

20 Q. It's your testimony that these are annual
21 income statements prepared by your accountant?

22 A. Yes.

23 Q. And would you agree that these statements do
24 not show the company's annual expenses?

25 A. Yes, I would agree.

1 Q. And what are the company's annual expenses as
2 far as an amount?

3 A. An amount?

4 Q. Yes.

5 A. Oh, for our total annual budget?

6 Q. Correct.

7 A. It is right between 7 and \$8 million this
8 year.

9 Q. Mr. Bromley went through the attachment to the
10 company's groundwater recharge water right application;
11 it was a 1903 contract.

12 Do you remember that testimony?

13 A. Yes.

14 Q. You talked with Mr. Budge about the water
15 rights the company has decreed, 1900 right for
16 3,000 cfs.

17 So if that contract identified a water right
18 for 3,400 cfs, what did the company actually get decreed
19 over time?

20 I guess if there's a difference between your
21 decree and that contract, what do you understand is your
22 water right today?

23 A. Well, I understand my water right to be
24 3,780 cfs of natural flow in the river with various
25 states with my 245,000 acre-foot of storage water

1 stacked on top of that.

2 Q. And I'll just focus on the 1900 water right.
3 Is it your understanding that the 1900 priority right is
4 for 3,000 cfs; is that correct?

5 A. Yes.

6 Q. So if that contract identified 3,400, that
7 would be inconsistent with your water right; is that
8 true?

9 A. Yes.

10 Q. Can you turn to page Exhibit 314. I think
11 that's your deposition transcript.

12 A. Okay.

13 Q. Page 224.

14 A. Okay.

15 Q. I think Mr. Bricker asked you about crops
16 perishing, and you read, I think, that answer on line
17 18; is that correct?

18 A. Yes.

19 Q. Can you read the rest of that answer, please.

20 A. From line 18: "Answer: I'm not familiar with
21 crops perishing. I am familiar with complaints of
22 reduced yields. Again, an inability to plant the crops
23 that they would like to plant because they know it's
24 going to be a short water year, so they go heavy on the
25 grain, heavy on the wheat, heavy on the barley, and

1 forgo the corn and the high-priced alfalfa."

2 Q. I guess one last question, Mr. Barlogi. In
3 terms of canal operations and efficiency, would you
4 agree that the irrigated acreage within your project is
5 not the only variable that affects that efficiency?

6 A. Absolutely.

7 MR. THOMPSON: That's all the questions I
8 have. Thank you.

9 HEARING OFFICER: Thank you, Mr. Thompson.
10 Recross by anybody in the groundwater users
11 group?

12 Mr. Budge?

13

14 RECCROSS-EXAMINATION

15 QUESTIONS BY MR. BUDGE:

16 Q. Mr. Barlogi, Mr. Thompson was just talking to
17 you about how farmers utilize their water. You
18 testified earlier that you're not a farmer and not
19 intimately familiar with their irrigation practices?

20 A. [Witness nods head.]

21 Q. And your testimony just given a moment ago was
22 that the farmers go heavy on the wheat and barley until
23 they're harvested and then move that water to the corn
24 and the sugar beets and things like that?

25 Was that your testimony?

1 A. Just now?

2 Q. Yeah.

3 A. No, I don't think that was the intent of that
4 conversation. Are you talking about the conversation I
5 just had with Mr. Thompson?

6 Q. Yes.

7 A. No, I don't think -- I think that's out of
8 context.

9 Q. Okay. I must have misunderstood.

10 Is it your testimony that while a farmer is
11 growing their barley and wheat, they irrigate their corn
12 and sugar beets and potatoes less, and then once the
13 grain and wheat is -- the barley and wheat is off, then
14 they irrigate them more at that point?

15 A. That is not the -- that is not the
16 conversation that Travis and I just had, no.

17 Q. Okay. So just so I understand -- and you
18 would agree that the cash crops are the corn and the hay
19 and the sugar beets, things like that?

20 A. [Witness nods head.]

21 Q. And so it's not your testimony that the
22 farmers are, you know, shorting those crops' water until
23 the wheat and barley is off; you're just saying once the
24 wheat and barley's off, there's just that much more
25 water that they can put on their other crops?

1 A. My testimony was that farmers forgo the
2 planting of corn and potato acres because they know it's
3 a short water supply year, and they plant more grain and
4 more barley and forgo those acres of going into the more
5 valuable crops of alfalfa and corn.

6 Q. You don't really know what the individual
7 farmer's rotations are on Twin Falls Canal's system
8 because you're not involved in their farming practices?

9 A. I know from a general perspective, but not
10 intimately with each farmer, no.

11 Q. You know from hearsay?

12 A. Well, from hearsay and from -- I mean, you can
13 see it from the road. When it's a big grain year
14 because it's a short water year, you can see noticeably
15 more grain on the project, noticeably less corn and
16 alfalfa.

17 MR. BUDGE: Yeah, Director, I would move to
18 strike the testimony about farmers' crop rotation
19 practices. This witness is not qualified to testify why
20 farmers grow one crop versus another.

21 HEARING OFFICER: I'll deny the motion to
22 strike. My impression is that Mr. Barlogi man ages and
23 observes what's happening out there. He may not know
24 exactly field to field because he's not a farmer, but,
25 nonetheless, he has sufficient exposure that his

1 testimony should be considered. Thank you.

2 Q. (BY MR. BUDGE) Mr. Barlogi, you understand
3 that commodity prices vary from year to year?

4 A. Certainly.

5 Q. And that commodity prices may drive farmers'
6 decisions to grow one crop versus another?

7 A. Certainly.

8 Q. Do you understand that certain types of crops
9 must be rotated with other crops to maintain soil
10 health?

11 A. Certainly.

12 Q. And certain crops are grown based on
13 contractual obligations to food producers?

14 A. Certainly.

15 Q. And you don't know why a given farmer may grow
16 one crop versus another crop from year to year?

17 A. Not from those perspectives that you just
18 mentioned, no.

19 Q. Okay. And then just one follow-up question
20 about the conversion from flood to sprinkler, which I'm
21 still struggling to wrap my mind around.

22 Do you understand when somebody irrigates with
23 flood irrigation, there's excess water on the field and
24 that excess water either sinks into the aquifer or it
25 drains off into a waste ditch?

1 A. Yes.

2 Q. And when somebody irrigates with sprinkler,
3 there's much less or maybe no excess water that runs off
4 or sinks into the ground?

5 A. Yes.

6 Q. But your testimony is that the sprinkler
7 farmers in your company's service area divert just as
8 much water from the canal as happened under flood
9 irrigation?

10 A. Yes.

11 MR. BUDGE: Okay. Nothing further.

12 HEARING OFFICER: Further questions by the
13 groundwater group?

14 All right. Our timing seems to be very good
15 again today. It's noon. Are we finished with
16 Mr. Barlogi, then?

17 Mr. Barlogi, you can go back to --

18 MR. THOMPSON: Yeah, just a quick question on
19 that. I'd like to release him. We did have certain
20 parties identify him as a witness. I assume all of his
21 testimony has been taken this morning; he can go home?

22 THE WITNESS: Okay. Thank you.

23 HEARING OFFICER: So the question is whether
24 Mr. Barlogi can be excused?

25 MR. THOMPSON: Yes.

1 HEARING OFFICER: So you're excused,
2 Mr. Barlogi, to go back to managing and delivering
3 water, an important thing to the patrons of Twin Falls
4 Canal Company.

5 I think we have one matter pending.
6 Mr. Budge, you asked if the Department would redact a
7 portion of Mr. Barlogi's written testimony.

8 MR. BUDGE: Yeah. And then I didn't object
9 when he quoted it, so we're going to let it slide.

10 HEARING OFFICER: So you want to let it go?

11 MR. BUDGE: I think the objection is still
12 appropriate, that it's based on hearsay, but --

13 MR. FLETCHER: It's in the record.

14 MR. BUDGE: It's not that critical at this
15 point.

16 HEARING OFFICER: All right. That simplifies
17 the operation of a black pen.

18 Okay. We'll come back at 1:00. Thanks,
19 everybody.

20 (Lunch break taken.)

21 HEARING OFFICER: We are back on the record
22 after a lunch break.

23 Mr. Sullivan, you're next. Will you stand and
24 raise your right hand, please.

25 ///

1 GREGORY K. SULLIVAN, P.E.,
2 called as a witness by the City of Pocatello, having
3 been first duly sworn to tell the truth relating to said
4 cause, testified as follows:

5
6 MS. TSCHOHL: Can you guys make sure the
7 microphones are on?

8 (Discussion held off the record.)

9 HEARING OFFICER: Now, is that better, I hope?

10 MS. TSCHOHL: Yes, we can hear you loud and
11 clear.

12 HEARING OFFICER: Okay. Good. Thank you,
13 Sarah.

14 All right. Mr. Sullivan has been sworn in.

15 Ms. Klahn?

16 MS. KLAHN: Thank you.

17

18 DIRECT EXAMINATION

19 QUESTIONS BY MS. KLAHN:

20 Q. Good afternoon, Mr. Sullivan.

21 A. Good afternoon.

22 Q. I'm Sarah Klahn. I represent the City of
23 Pocatello, and we're here to put on your expert report
24 in this matter.

25 Could you start by stating your name and

1 spelling it for the record, please.

2 A. Gregory K. Sullivan, G-r-e-g-o-r-y,
3 S-u-l-l-i-v-a-n.

4 Q. And are you a consultant engaged by the Cities
5 to present opinions in this matter?

6 A. Yes.

7 Q. What's your present professional position?

8 A. I'm the president of Spronk Water Engineers.

9 Q. And do you have any professional
10 registrations?

11 A. Yeah, I'm a licensed professional engineer in
12 Colorado, New Mexico, and Idaho.

13 Q. And I believe the parties have stipulated to
14 your admission as an expert in this matter, so I don't
15 want to go over all the things we normally would go over
16 in that context.

17 But can you describe, in just a couple
18 sentences, your general work experience?

19 A. For my entire career I've been working in
20 water rights and water resources engineering; for my
21 present company since 1990, and then for a different
22 company for the five years prior to that.

23 So I've been working in this area of water
24 resources, water rights, modeling groundwater for my
25 whole career.

1 Q. And have you participated in the -- in prior
2 delivery calls?

3 A. Yes, I have.

4 Q. Which ones?

5 A. I was -- I've been involved in the Surface
6 Water Coalition delivery call since its beginning. And
7 then I was also heavily involved in the A&B delivery
8 call and the Rangen delivery call.

9 Q. And you have experience with the SRBA as well?

10 A. Yes. I've assisted numerous clients in filing
11 for their claims and reviewing the claims, helping them
12 get them adjudicated.

13 Q. Can tell us about your modeling experience in
14 Idaho.

15 A. I've been a member of the Eastern Snake
16 Hydrologic Modeling Committee since its inception and,
17 actually, prior to that, the Idaho -- ITCH, the Idaho
18 Technical Committee on Hydrology, that was the
19 predecessor group.

20 And both of those -- one of the major tasks of
21 both of those groups has been to sort of oversee and
22 provide peer review on the development of the Eastern
23 Snake Plain Aquifer model over the years.

24 Q. Thank you.

25 Who exactly are you representing in this

1 matter?

2 A. The City of Pocatello, the City of
3 Idaho Falls, and the Coalition of Cities, which is 15
4 smaller ESPA cities.

5 Q. And you mentioned that you've been working on
6 the Surface Water delivery call for a number of years.

7 Were you involved in the original 2005 Surface
8 Water delivery call?

9 A. Yes.

10 Q. Can you describe, in a general way, the
11 investigations you conducted at that time?

12 A. Well, we compiled data, reviewed the
13 voluminous data that was submitted by the parties, and
14 then, importantly, we conducted a pretty thorough
15 investigation of all of the Surface Water Coalition
16 members. And that included reviewing, you know, a lot
17 of their historical information, historical records.

18 We spent, like, three weeks in the field, you
19 know, going through all of their systems, observing them
20 and observing their water conveyance and delivery
21 facilities involved, looking at their irrigation
22 practices. It was quite extensive.

23 And that culminated in an analysis that was
24 summarized in my original expert report of their
25 operations during the period from -- I think it was 1990

1 to 2006.

2 Q. Okay. And have you produced an expert report
3 in this matter?

4 A. Yes, I have.

5 Q. Okay. And that would -- is that Exhibit 347?
6 Could you find that?

7 Now, Mr. Sullivan, I understand that you were
8 out of the country immediately before the start of this
9 hearing; is that right?

10 A. Yeah. I was in Spain and Morocco.

11 Q. And I believe that when you returned, you had
12 a chance to review the report, which you had largely
13 completed before you left; is that right?

14 A. Yes. I had a little bit of opportunity to
15 work on it while I was away, but spotty internet
16 connections and stuff like that. And so, yeah, I
17 looked -- I was able to look at it in some more detail
18 when I got back.

19 Q. And when you got back, did you discover that
20 there were some errors -- editorial errors, primarily,
21 in the report.

22 A. Yes, there's some things I would like to
23 correct.

24 Q. Okay. And are you looking at Exhibit 347 that
25 has the pages of errata? I just want to make sure we

1 have the current version in the exhibit binder.

2 MR. FLETCHER: Is this 347?

3 MS. KLAHN: 347A. Sorry.

4 THE WITNESS: I don't think it is.

5 MS. KLAHN: 347A, is there such a thing up
6 there?

7 No, I know, but did we make a copy of it?

8 THE WITNESS: My copy has that.

9 MS. KLAHN: I know yours does.

10 MR. BROMLEY: I can get it printed.

11 MS. KLAHN: Let's just go off the record for a
12 minute.

13 (Discussion held off the record.)

14 MS. KLAHN: Back on the record.

15 Q. (BY MS. KLAHN) So the conversation we just
16 had off the record was about replacing 347 with 347A at
17 the conclusion of your testimony.

18 However, Mr. Sullivan, did you have something
19 to explain about the -- some of the errors maybe not
20 being completely editorial?

21 A. There was a handful that were -- you know, I
22 just missed a word. And, like, for example, the word
23 "not" was in there and something -- in one of the
24 statements; and that "not" should not have been there.

25 So that's substantive.

1 Q. Well, do you want to take a minute now and
2 identify where that is so people can get in, if they
3 have a paper copy of the old version, and change that?

4 A. I don't think I can do it thoroughly with what
5 I have right here. I have, like, a redline on my
6 computer.

7 Q. Well, we'll just keep going, then.

8 A. I'll try to remember if I see something.

9 MR. FLETCHER: Just to clarify this issue, the
10 page numbers changed when you changed exhibit numbers.
11 So it's going to be very -- is there anybody that has an
12 extra copy or a copy of 347A that the witness can --

13 MR. WOOD: I can print one off if somebody
14 emails it to me.

15 MR. BROMLEY: Yeah. So Max has it right here.
16 Can he send it to you, Pete?

17 MR. WOOD: Okay. Email it to me, and I'll go
18 print it.

19 MR. FLETCHER: Because otherwise this is going
20 to be confusing.

21 MR. WOOD: Yeah, it's fine.

22 MR. BRICKER: What's your email?

23 MR. WOOD: pete.wood@idwr.

24 MS. KLAHN: Shall we take a five-minute recess
25 maybe?

1 HEARING OFFICER: That would be fine.

2 (Break taken.)

3 (Exhibit 347A marked.)

4 HEARING OFFICER: All right. Back on the
5 record.

6 Ms. Klahn.

7 MS. KLAHN: Thank you, Pete, for your help
8 with that.

9 MR. WOOD: No problem.

10 Q. (BY MS. KLAHN) We're back on the record.

11 And, Mr. Sullivan, you've been presented with
12 Exhibit 347A. And in that report, could you identify --
13 we were just talking before we broke to get a copy of
14 this, we were talking about your involvement in the
15 other delivery call matters.

16 Does this 347A -- Exhibit 347A show the --
17 have a list of the reports you've prepared in prior
18 delivery call matters?

19 A. It does.

20 Q. Could you identify where that is?

21 A. It's on page 4. This isn't all the other
22 delivery call matters, it's just the reports, like,
23 related to this delivery call -- or the Surface Water
24 Coalition.

25 Q. Yes, that's what I meant, in the Surface Water

1 Coalition delivery call. Okay. Thank you.

2 Do you still stand by the opinions in the
3 prior reports?

4 A. I do.

5 Q. Do you still stand by the methods you used in
6 the prior reports?

7 A. Yes.

8 Q. Have you updated any of those analyses?

9 A. I would have liked to, but there wasn't time.

10 Q. And then as far as your work in this case, you
11 said you haven't updated your work from the last case,
12 but have you identified changed conditions since you
13 prepared the prior reports?

14 A. Yes.

15 Q. And what page is that on in your report?

16 A. It's the series of bullets near the bottom of
17 page 2.

18 Q. And then one more sort of foundational
19 question.

20 Were you involved in the 2022 technical work
21 group process?

22 A. I was.

23 Q. How were you involved?

24 A. I received an invitation to that. And there
25 was a series of meetings -- half a dozen meetings, I

1 think, that the Department hosted that I attended
2 remotely. And then I presented some information at a
3 couple of the meetings on a couple of the subjects. And
4 then, ultimately, when the staff recommendation was
5 issued, I reviewed that and submitted written comments
6 to that.

7 Q. Okay. And just for the record, I'd ask you to
8 take a look at Exhibit 316.

9 Is this the staff recommendation that you
10 referred to?

11 A. Yes.

12 Q. And Exhibit 326, could you take a look at
13 that? Is that the comments that you submitted in
14 response to the staff recommendation?

15 A. 326, it looks like Sophia's comments.

16 Q. How about 327?

17 MR. BRICKER: I think it's 322.

18 MS. KLAHN: 322. Sorry.

19 THE WITNESS: Yes.

20 Q. (BY MS. KLAHN) So 322 are the comments that
21 you and your colleagues at Spronk Water Engineers
22 submitted in response to the technical work group?

23 A. Yeah, in response to the staff recommendation
24 memo.

25 Q. I apologize. Yes, that's right. In response

1 to the staff memo.

2 Did you receive any feedback on your written
3 comments from anybody at IDWR?

4 A. I did not.

5 Q. Now, let's take a look at Exhibit 300, which
6 is the Fifth Methodology Order, and Exhibit 301, which
7 is the As-Applied Order.

8 A. Okay.

9 Q. Have you previously reviewed Exhibit 300?

10 A. Yes.

11 Q. Were your comments submitted to the technical
12 work group incorporated into the Fifth Methodology
13 Order?

14 A. Not that I could tell.

15 Q. And as far as the hearing today on the two
16 orders reflected in Exhibit 300 and 301, in your
17 professional estimation, did you have adequate time to
18 review the Fifth Methodology Order and the As-Applied
19 Order to prepare for the hearing?

20 A. No. I mean, I did what I could, but there
21 wasn't time to do all I would have liked to have done.

22 Q. So let's just -- for a high-level summary,
23 let's talk about what work you were able to do.

24 And I believe if you turn to the table of
25 contents in Exhibit 347A, that might be a guide for

1 your -- if you can give us an overview of what work you
2 were able to do.

3 A. Yeah. So in addition to just reviewing the
4 order and the Fifth Methodology and the As-Applied
5 Order, then there was a number of issues that I
6 identified that I ended up focusing on. And they're,
7 basically, the subject of my expert report.

8 So that was looking at the new baseline year;
9 looking at the updated project efficiencies for the
10 Surface Water Coalition members; looking at the
11 irrigated area that is used in the methodology;
12 considering the supplemental groundwater as a potential
13 source to the Surface Water Coalition members, which is
14 a provision of the methodology; looked at the change
15 from steady state to transient groundwater modeling for
16 determination of the priority date of curtailment. So
17 those are the main things I focused on.

18 Q. Okay. Could you identify the work you would
19 have done if you'd had more time?

20 A. Well, I would have liked to have, you know,
21 looked at the -- taken another -- a relook at the
22 operations of the Surface Water Coalition members
23 because there's been 15 years, roughly, since -- have
24 elapsed since I last looked at them, and I know,
25 anecdotally, there's been continued conversions to

1 sprinkler and canal lining and other automation, those
2 things that we heard Jay Barlogi talk about today.

3 So I'd like to understand the extent of those
4 things that have gone on. And then, you know, that
5 would give me a good -- a better context, I guess, to
6 then look at the records of what they've been using over
7 that time and consider the sort of the reasonableness of
8 their operations given what their efficiencies are. So
9 that's one thing I would have liked to have done.

10 Q. Okay. The -- it has been 15 years since the
11 2008 hearing, exactly 15 years almost.

12 How does the changes during that time -- how
13 would the changes during that time inform your, I guess,
14 opinions if you'd had the time to look at those changes,
15 potentially?

16 A. Well, you know, for example, these updated
17 project efficiencies, you know, I think by analyzing the
18 Surface Water Coalition numbers, it would give me --
19 operations over the last 15 years, that would give me a
20 better ability to judge the reasonableness of those
21 efficiencies and whether they're -- the revised
22 efficiencies are consistent with the kind of facilities
23 that they have and if the general, you know, industry
24 standard of large -- of the operation of large
25 irrigation systems.

1 MS. KLAHN: Now, I'd like to offer
2 Exhibit 347A at this point just so I don't forget to do
3 it.

4 HEARING OFFICER: Any objection?

5 MR. FLETCHER: I have an objection just to a
6 couple of comments made by Mr. Sullivan where he's
7 delving into the realm of judicial review. And,
8 basically, I'm asking that certain portions of the
9 report be stricken. They're very small, but one is on
10 the bottom of page 6 and continues to page 7 where he
11 talks about the findings of the Director to be arbitrary
12 and no clear and convincing evidence.

13 On page 7, paragraph 2, he talks about the
14 actions of the Director being arbitrary and capricious.

15 And in page 27, bullet point 3, he makes
16 reference to Director's actions being arbitrary.

17 And those are standards for judicial review.
18 They're really not an expert's standard dealing with
19 data and data interpretation.

20 HEARING OFFICER: Ms. Klahn?

21 MS. KLAHN: Well, I would say what's sauce for
22 the goose is sauce for the gander, and Mr. Brockway has
23 similar statements in his report. I think that expert
24 s, especially in the water realm, routinely make those
25 kinds of statements. And I'm assuming the Director has

1 seen that before and will take it for what it's worth
2 and that it's certainly not going to control any appeal
3 that might be filed and heard by Judge Wildman. So I
4 would say they're not the sort of thing that should be
5 stricken, but if they are, then the same thing should
6 come out of Dr. Brockway's report.

7 HEARING OFFICER: Well, and of course, I don't
8 know what Dr. Brockway's report even says.

9 MS. KLAHN: Oh, I think all I'm asking for is
10 a global rule, not just a groundwater-specific rule.

11 HEARING OFFICER: I'll overrule the objection.
12 I don't think these references will affect my
13 decision-making in any way. Overruled.

14 MS. KLAHN: So is the exhibit accepted, then?

15 MR. FLETCHER: I don't have an objection.

16 HEARING OFFICER: So the document marked as
17 Exhibit 347A is received into evidence. Thank you,
18 Ms. Klahn.

19 (Exhibit 347A received.)

20 MS. KLAHN: Thank you.

21 Q. (BY MS. KLAHN) Mr. Sullivan, let's start with
22 baseline year investigations that you had time to do.

23 Could you describe your review of the baseline
24 year that was selected for the Fifth Methodology Order?

25 A. While there was some discussion of that at the

1 technical working group, it was one of the things that
2 was brought to us. And the basic proposal was -- or the
3 information that they submitted to us and is described
4 in their -- I think in the Fifth Methodology Order was
5 that the previous baseline year, which was an average of
6 diversions during 2006, 2008, and 2012, was no longer
7 representative of a year of above-average diversions,
8 and that's because there had been -- they recomputed the
9 average with an additional six or eight years, so the
10 average changed, and now that baseline year, which --
11 '06, '08, '12 -- which was above average before now is
12 just a tiny, tiny bit below average.

13 And so I endeavored, then, to just review that
14 pretty simple data of the diversion data in relation to
15 the new baseline year that was selected and just kind of
16 verify or understand the math that went involved -- that
17 was involved.

18 Q. Do you have a recollection of how much below
19 average the post -- I'm going to call it '06/'08/'12
20 baseline year was?

21 A. Yeah. Well, based on the information that was
22 provided by the Department, the '06 -- I'll call it
23 '6/'8/'12.

24 Q. Okay.

25 A. The '6/'8/'12 baseline year was

1 5,666 acre-feet per year less now than the average. So
2 that's, you know, 5,600 acre-feet out of 3.2 million.
3 So just a very, very small amount, .18 percent less.

4 Q. So was there a problem with the backup
5 spreadsheet for the '6/'8/'12 change that IDWR provided?

6 A. Well, I did note that when I looked at the
7 information that was provided where they computed the
8 new long-term average, which was now using data from
9 2000 to 2021, looking at the data within that
10 spreadsheet, it looked like some of the numbers during
11 the earlier part of the period had changed from what was
12 used to compute the original '6/'8/'12 baseline, and I
13 don't know why. Maybe that was provisional data that
14 they updated, and it wasn't extensive, but there was
15 some changes.

16 But, curiously, the Department was still using
17 the original '6/'8/'12 value as the benchmark for
18 comparison of the new average. That '6/'8/'12 benchmark
19 was still from the old data, the uncorrected data, and I
20 thought that was kind of -- I don't know if it was an
21 oversight or intentional. But, anyways, when I plugged
22 it -- I tried to recompute the '6/'8/'12 baseline with
23 the new data, new diversion data, and it changed a
24 little bit.

25 And now with the new '6/'8/'12 baseline -- or

1 with the updated diversion data, you know, is only now
2 40 acre-feet less than the 2000 to 2021 average. So
3 just a tiny -- the tiniest bit less.

4 Q. So is 40 acre-feet pretty small in comparison
5 to the total diversions?

6 A. Yeah, very small. I mean, it represents -- I
7 put this calculation -- it represents about five minutes
8 of diversion of the Surface Water Coalition members'
9 total diversions on average. So it's a tiny, tiny
10 amount. But to be sure, it's still below average.

11 Q. So the -- did IDWR include 2022 data when they
12 were calculating the comparison for the '6/'8/'12
13 baseline year?

14 A. No, they didn't. And so that -- so that was
15 something I thought might be interesting to look at, so
16 I added on the data -- diversion data from 2022 and
17 recomputed that long-term average, 2000 to 2022 now,
18 instead of 2000 to 2021. And then when you compare that
19 average to the updated '6/'8/'12 baseline year, then it
20 turns out that '6/'8/'12 is still above average now.

21 Q. So based on your understanding of the
22 Department's methodology for selecting a baseline year,
23 if the average that's being compared to the old baseline
24 year is greater, would it be appropriate to pick a new
25 baseline year based on your understanding?

1 A. Well, I'm not sure if you -- maybe I
2 misunderstood your question.

3 Q. Did I turn it around?

4 A. You might have turned it around. But I think
5 if you include 2022 and then do that comparison,
6 '6/'8/'12 will still qualify as a baseline year.

7 Q. That's what I was trying to get at. Thank
8 you. Well, but a new baseline year was selected as
9 2018.

10 Do you recall what the total diversions were
11 associated with 2018?

12 A. Yeah, it's 3,341,939 acre-feet.

13 Q. And what kind of increase is that over
14 '6/'8/'12?

15 A. It's roughly 142,000 acre-feet more. So that
16 tiny amount, you know, either 40 acre-feet or
17 5,000 acre-feet, that the old baseline year fell below
18 the average, resulted in this huge increase in the
19 baseline year, 142,000 acre-feet. And that was kind of
20 eye-opening.

21 Q. Did you analyze whether the surface water --
22 well, let me ask you first: What was the diversion
23 averaging period used in the Fourth Methodology Order?

24 A. I think it was 2000 to 20 --

25 Q. '14 sound right?

1 A. 2014, yes.

2 Q. Did you look at whether Surface Water
3 Coalition member diversions increased since 2015?

4 A. I did, yes.

5 Q. And what was that amount?

6 A. Yeah, their diversions have increased on
7 average by about 143,000 acre-feet.

8 Q. Which is --

9 A. So the diversions during the later period were
10 143,000 acre-feet greater than the 2000-to-2014 period.

11 Q. And the 143,000 is pretty close to the 142,000
12 increase in the baseline year from '06 -- '6/'8/'12 to
13 2018; correct?

14 A. Yes, uh-huh.

15 Q. Did you find any analysis in the materials
16 provided by IDWR or Exhibit 300 that suggested that IDWR
17 had analyzed why Surface Water Coalition member
18 diversions increased?

19 A. I haven't seen anything like that.

20 Q. Okay. Were you surprised that the diversions
21 increased from 2015 forward?

22 A. Yes, I was.

23 Q. Why?

24 A. Well, I mean, just my -- as I mentioned
25 earlier, you know, the continued sprinkler conversions,

1 these efficiency improvements, those kinds of things
2 would suggest that, if anything, the diversions should
3 have gone down, anything -- that they should have been
4 able to get by with less, but they've been diverting
5 more.

6 Q. Do you have any concerns about the process
7 that's used to develop the baseline year given these
8 findings?

9 A. Yes. It seems like there's this positive
10 feedback loop, I will call it, that exists in the
11 process, whereby, essentially, the more they divert, the
12 higher the baseline year needs to be to keep the
13 baseline year as a year above average, and so there's
14 really a disincentive to become more efficient because,
15 you know, the more they divert, the higher the baseline
16 year, the more the groundwater users have to come up
17 with mitigation water.

18 Q. Thank you.

19 Let's move to project efficiencies. Were you
20 here yesterday when Mr. Anders testified?

21 A. I was, uh-huh.

22 Q. Did you hear his testimony about the
23 calculation used in the Methodology Order to calculate
24 project efficiencies -- I'm sorry, to calculate -- about
25 the use of project efficiencies to determine monthly

1 crop water demand?

2 A. Yes.

3 Q. Do you agree with how IDWR uses the project
4 efficiencies in that calculation Methodology Order?

5 A. No.

6 Q. Why not?

7 MR. THOMPSON: I'd like to lodge an objection
8 here. Just briefly, I think the methodology itself,
9 these calculations Ms. Klahn is talking about, have been
10 established, have been subject to judicial review. I
11 don't think they've changed in the Fifth Order to the
12 extent that we're opening up the methodology to redo it.
13 So to the extent that she's asking for testimony about a
14 separate methodology, I think it's beyond the scope.

15 HEARING OFFICER: Ms. Klahn.

16 MS. KLAHN: Mr. Director, our intention is to
17 offer some suggestions about how to use the existing
18 process that the Department has to make it more
19 reliable. And the ground that was plowed in 2007 --
20 Mr. Sullivan will spend a little bit of time talking
21 about why that was a good idea, but understanding, also,
22 that that's not the direction the Department chose to
23 go.

24 So when I ask if he agrees with how IDWR uses
25 project efficiencies, it's to set up the testimony about

1 the improvements that he's proposing for the current
2 approaches.

3 HEARING OFFICER: I think consistent in all of
4 the discussions has been a theme that the Methodology
5 Order was and is intended to be a dynamic document that
6 would be subject to change and would change with better
7 information, better data, and better analysis. And so
8 as a result, I'll overrule the objection.

9 MS. KLAHN: Thank you.

10 HEARING OFFICER: Ms. Klahn -- or
11 Mr. Sullivan, you may answer the question, if you
12 remember it.

13 Q. (BY MS. KLAHN) I think the question was: Why
14 don't you agree with how IDWR uses project efficiencies
15 in the Methodology Order, generally?

16 A. Well, generally, it -- this is another one of
17 these kind of feedback-loop things, that the historical
18 diversions are used in determining the project
19 efficiencies, and then the project efficiencies are used
20 to determine the demand.

21 So it's kind of a self-fulfilling prophecy
22 that the methodology that -- that the method will
23 predict a demand that's equal to what they've been
24 diverting. And so there's really no opportunity to
25 interject and look at: Is what they're diverting

1 reasonable and consistent with industry standards, or do
2 you never get to look at -- behind the curtain at the
3 efficiency and the operation of the members?

4 So that's generally my concern.

5 And then, also, as I'll get into a little bit
6 later, it presumes that crop water need is a good
7 predictor of what they need to divert. And while, in
8 theory, that is -- that would be true, and it's true of
9 most systems, it doesn't seem to be true in this
10 situation a lot of times, as we'll see, that they -- a
11 lot of times these Surface Water Coalition members kind
12 of divert what they divert no matter what the crop water
13 need is.

14 So their diversions are kind of flat in
15 relation to -- instead of going up with the crop water
16 need.

17 So we'll get into that a little later.

18 Q. Okay. Well, I'm going to ask you to get into
19 some of it a little bit right now.

20 First of all, when you talk about the IDWR
21 calculation for project efficiency -- which, as
22 Mr. Anders talked about yesterday, is crop water need
23 times acres divided by diversions -- what kind of an
24 efficiency is that, in your professional understanding?

25 A. Well, I've always called that an actual

1 efficiency.

2 Q. What's the result of an actual efficiency when
3 you try and use it for administration?

4 A. Well, it does what I just talked about
5 earlier. If you use the actual efficiencies, divide it
6 into the crop water need, you're just going to get what
7 they historically divert, more or less.

8 Q. And if you divert more, what happens to the
9 efficiency number?

10 A. Then the efficiency goes lower, and then --
11 and then you get back to the same diversion.

12 Q. How did you analyze Surface Water Coalition
13 member efficiencies in your first expert report in 2007?

14 A. Well, I applied what I would characterize as
15 an industry standard approach for assessment of
16 irrigation systems -- that I've done myself in a lot of
17 situations and I've seen done in a lot of other
18 situations -- in terms of both analysis of the
19 historical use of irrigation systems for purposes of
20 water rights transfers.

21 You know, I've done a bunch of those. And the
22 procedure for doing that -- well, let me back up.

23 There's been hundreds or thousands of those
24 kind of transfer analyses -- historical use analyses
25 done for transfers in Colorado where I've done a lot of

1 my work, and that is the basis. Analyzing the systems
2 in that way and the way that I did here for the Surface
3 Water Coalition is what is done for those transfers.

4 And so those are very, you know, high -- you
5 know, high-value or involving, you know, very important
6 decisions about historical use. And a lot of money is
7 at stake and all that.

8 And these are the methodologies that are used
9 to do that -- you know, figure out how much water is
10 being consumed and how efficient, you know, these
11 systems are.

12 And then also in modeling, too, I've used
13 these kinds of methods to evaluate the operations of
14 irrigation systems.

15 Q. So in those calculations that you've done in
16 those other situations, did you calculate a monthly or a
17 seasonal efficiency?

18 A. So when I do those kinds of analyses -- and
19 the standard is typically to calculate a seasonal
20 efficiency. And the reason for that is that if you're
21 trying to vary the efficiencies monthly, then it brings
22 into question some other things that may be going on,
23 particularly -- which is water moving in and out of soil
24 moisture to help meet the crop demands. And if you
25 don't accurately account for that, then you can get some

1 kind of misleading or monthly efficiencies.

2 And so, typically, to overcome that we will
3 use a seasonal efficiency. Even when we're doing a
4 monthly calculation, the input to that will still be a
5 seasonal efficiency. And it helps to round out some of
6 those curious-looking results that you get.

7 And we've seen in the methodology here where
8 you've got, like, these very, very low efficiencies in
9 some of the shoulder months that make the method real
10 sensitive to -- you know, a small change in a crop water
11 need divided by a low efficiency all of a sudden results
12 in a large change in the diversion demand.

13 Q. Is the method you're describing one that's
14 been used by IDWR in any prior delivery calls?

15 A. Yes. You know, the method that I used in my
16 original analysis of the Surface Water Coalition ended
17 up being, essentially, what the Department used in
18 evaluating the delivery call of the -- for the B unit of
19 the A&B system. And, in that, they were looking at, you
20 know, whether -- the supplies of water that they were
21 able to pump from the wells in the B unit and deliver to
22 the farms, whether that was a supply that was adequate
23 to meet the demands for those lands.

24 And so in that situation, the Department
25 determined what the conveyance losses were in getting

1 water to the farms. And those are all real short
2 conveyance systems because they're only delivering water
3 down some laterals from a well. So in that situation I
4 think the conveyance losses were on the order of
5 3 percent, say.

6 And then they looked at the on -- what the
7 on-farm application efficiencies should be under a
8 reasonable operation, and I think in total they ended up
9 using a system efficiency -- or a project efficiency in
10 A&B of about 75 percent. And that was, basically, the
11 combination of the on-farm and the conveyance
12 efficiency.

13 And that was used, then, to determine whether
14 what they were able to deliver to the farm was enough to
15 meet the crop water demand. And based on -- I think
16 that was part of the reason that delivery call was
17 denied was because there was a determination that they
18 did have enough water.

19 Q. And the determination you're talking about, is
20 that contained in an Idaho Department of Water Resources
21 order dated January 29th, 2008?

22 A. That sounds right.

23 MS. KLAHN: Mr. Director, we'd ask you to take
24 judicial notice of that Department document.

25 HEARING OFFICER: Any objection?

1 It is an order of the Department, so I'm
2 willing to look at it. I'll take notice.

3 Q. (BY MS. KLAHN) Mr. Sullivan, let's go to
4 figure -- let's go to your figures in Exhibit 347A. I'd
5 like to start with Figure 3-1.

6 First of all, just let me just ask you: Does
7 Figure 3-1 illustrate some of the testimony you've been
8 giving about the concerns you have with the Department's
9 use of the project efficiency crop water need
10 determination?

11 HEARING OFFICER: What page are you on,
12 Ms. Klahn?

13 MS. KLAHN: There's no page numbers at that
14 point. If you go all the way through the report, it's
15 right after the map. It's the first page of figures.

16 HEARING OFFICER: I found it. Thank you.

17 Q. (BY MS. KLAHN) Are you there?

18 A. Yes, I'm there.

19 Q. Do you remember my question?

20 A. You should read it again, if you wouldn't
21 mind.

22 Q. Does Figure 3-1 illustrate some of the
23 testimony you've been giving about your concerns with
24 the Department's incorporation of project efficiency --
25 the Department's methods of incorporating project

1 efficiency into the Methodology Order?

2 A. Yes.

3 Q. Could you talk about what we're -- what
4 Figure 3-1 shows?

5 A. Okay. So this is just showing a -- project
6 efficiency information that was provided by the
7 Department and that was used as the basis for the --
8 developing the monthly efficiencies -- project
9 efficiencies that are used in the Methodology Order.

10 So on this page there's a -- several graphs.
11 There's one graph for each of the Surface Water
12 Coalition members. And the graphs depict project
13 efficiency. That's the y-axis on each of these graphs.
14 And it depicts monthly project efficiencies, at least
15 for some of the data on here. So that's the months
16 along the bottom.

17 And then the solid black line with the
18 connecting -- the open white-and-black dots represents
19 the monthly project efficiencies for each of the members
20 that are used in the Methodology Order.

21 And then I also put on here, for reference
22 purposes or comparison purposes, the dotted black line,
23 which is the average of the monthly efficiencies used in
24 the Methodology Order. And it's the same average number
25 that I think is at the bottom of the table of monthly

1 efficiencies in the Fifth Methodology Order.

2 And then one more comparison I put in here is
3 the blue line, and that's the -- what I term the
4 "reasonable annual efficiency" or -- that I had
5 previously determined for the Surface Water Coalition
6 members based on my earlier work in my 2007 expert
7 report.

8 Q. And what do you conclude from the figures we
9 see -- the graphs we see on Figure 3-1?

10 A. Well, there's -- one thing is that, you
11 know -- you can see the shape of these monthly
12 efficiency curves are, you know -- with some exceptions,
13 the efficiencies start out relatively low in the spring
14 and then peak up in the middle of the irrigation season
15 and then fall off quite a lot in some cases, in
16 September and October.

17 The other thing I would note and just -- and
18 compare in looking at -- comparing the dotted black line
19 to the blue line is that in some cases the actual -- the
20 actual efficiencies -- the actual project efficiencies
21 represented by the average of the monthlies for some of
22 the members it's pretty close to the number that I came
23 up with previously.

24 So -- like for A&B, for example, they are
25 operating at the level that -- near the level that I

1 thought they should be able to operate.

2 And -- but others -- you know, in cases where
3 the dotted black line is quite a bit below what I had
4 previously determined, then I think there's some room
5 for improvement in some of those systems.

6 Q. Okay. Thank you.

7 Let's turn now to the next page, which is
8 Figure 3-2. And would you talk about what we're seeing
9 in Figure 3-2, please.

10 A. So this is just a depiction of some of the
11 same information that was on Figure 3-1, and,
12 specifically, the monthly project efficiencies for each
13 of the members. And I just plotted them all on one
14 graph here so that we could kind of see them next to --
15 or on top of each other.

16 Q. So would some of these differences in project
17 efficiency be related to the nature of the -- nature and
18 size of the canal system?

19 A. Yeah, it would. Because, you know, as I
20 talked about earlier, this project efficiency is,
21 basically, the -- has two components, there's a
22 conveyance loss component, or a conveyance efficiency,
23 and then there's an on-farm efficiency. And the product
24 of those is the project efficiency.

25 And so for the conveyance efficiency piece of

1 that, you know, it's -- it makes sense, and it's true,
2 that for long -- for very long and large conveyance
3 systems that have more miles of canal, they're going to
4 have more seepage loss in delivering water. So you'd
5 expect them -- those kind of systems -- like an AFRD2,
6 for example, they're going to have a lot larger
7 conveyance efficiency -- oh, wait, conveyance loss than
8 would be a smaller system like A&B, for example.

9 So you would expect that these monthly
10 efficiencies wouldn't be the same, necessarily, but I
11 don't think all of the differences between these are due
12 to conveyance efficiency. I think that some of -- and
13 we'll get into this, I think, a little bit later -- but
14 some of this difference is due to some of these systems
15 in pulling up, basically, a higher level of management
16 and so that they're able to just generally be operating
17 more efficiently both, you know, in delivering water to
18 the farms with less waste and then also the farmers
19 taking -- you know, having to operate more carefully,
20 you know, to meet their crop water needs.

21 For example, because some of these -- some of
22 the Surface Water Coalition member systems set an annual
23 allotment so the user has to operate within that
24 allotment, and so there's kind of a built-in incentive
25 to only take the water and use it when you need it.

1 But other systems that are more on demand,
2 like Twin Falls, for example, they don't have an annual
3 allotment, so, you know, they can take up to a rate of
4 flow whenever they want to order it. So in those
5 systems, there's not as much incentive to conserve
6 water, and I think that kind of thing plays into the
7 reason why some of these efficiencies are different.

8 Q. Thank you.

9 Let's look at Figure 3-3, please.

10 This is titled, "Reasonable and Actual Project
11 Efficiencies 2008 Hearing vs. Fifth Methodology Order."

12 What is this showing us?

13 A. This is some more of that information that I
14 had on the previous page with some additional
15 information as well.

16 So in this graph now, and then this graph at
17 the top, and then the numbers in the table below,
18 it's -- you know, they're both the same information.
19 I'm graphing the numbers. And what the graph shows is
20 the annual project efficiencies or seasonal project
21 efficiencies for each of the members and different
22 depictions of that.

23 And then along the bottom, I just have --
24 there are the members called out themselves.

25 And so the Fifth Methodology efficiency -- or

1 average -- the average efficiencies in the Fifth
2 Methodology Order are the black dots joined by the black
3 line.

4 And then the efficiencies that the average
5 project -- actual project efficiency, so the comparable
6 number that I determined for the Surface Water Coalition
7 members for the 1990-to-2006 period that I analyzed
8 earlier for the -- my 2007 expert report is shown with
9 the red line.

10 And then I've also -- related to the red line
11 is this pink area, and that pink area represents the
12 range of annual efficiencies that I determined for each
13 of the Surface Water Coalition members for that
14 1990-to-2006. So they vary from year to year, so I've
15 got the range reflects the minimum and the maximum, and
16 I've shaded the area in between.

17 And then, finally, I have shown on here what
18 I've termed the reasonable efficiency, and that's
19 that -- the reasonable project efficiency that I had
20 previously determined from that -- from my work in the
21 original Surface Water Coalition delivery call.

22 Q. What conclusions do you draw from Figure 3-3?

23 A. Well, one, is when I compare that -- the red
24 line to the black line, that shows that for -- you know,
25 most of the Surface Water Coalition members, that black

1 line is less than the red line, and so that indicates
2 their actual efficiencies have gone down since 1990 to
3 2006. So I thought that was interesting.

4 That's going the opposite direction from what
5 I would expect given these continued conversions to
6 sprinkler, canal lining, better irrigation system
7 operation technology, and that sort of thing.

8 The other thing that I would note from this is
9 that my blue line, the reasonable efficiency line, is --
10 you can see that the -- that red-shaded area, which is
11 the range of efficiencies, kind of butts up to that blue
12 line for most of the users. And so that -- that
13 indicates that during 1990 to 2006, most of the -- or at
14 least, roughly -- well, five of the seven members were
15 shown an ability to operate at a reasonable level that I
16 had determined previously and determined independently.

17 And so this is kind of a validation, I think,
18 of the method that I used previously. But then, you
19 know, the exceptions here are over here for North Side
20 and Twin Falls, whose operations -- you know, historical
21 operations during 1990 to 2006 fell well below what I
22 thought they should be operating at.

23 Q. Have there been -- I think you've already
24 answered this question, but just to close the loop here:
25 Had there been time, would you have updated the

1 reasonable project efficiencies for the Surface Water
2 Coalitions based on your -- based on their operations
3 during the last 15 years?

4 A. Yes, I would have liked to have updated that
5 blue line.

6 Q. And if you had updated it, what would you have
7 done with that?

8 A. Well, I would have -- I would expect that, you
9 know, with -- just for the simple issue of the continued
10 conversions to sprinklers, they should have a higher
11 on-farm efficiency. So just for that reason alone, I
12 think the blue line should be going -- ticking up a
13 little bit, and there may be other reasons that the --
14 you know, for other efficiency improvements that the
15 blue line ought to tick up a little.

16 Q. Now, in 2007 you were recommending that the
17 Department incorporate efficiencies -- the reasonable
18 project efficiencies as a way to -- as part of the
19 administration of the Surface Water Coalition delivery
20 call; correct?

21 A. That's right.

22 Q. And I want to just talk about that for just a
23 second because, as I recall, there's a lot of hostility
24 to that idea, and I wonder about whether you could
25 explain how would you operationalize something like

1 that?

2 Are you talking about an army of Department of
3 Water Resources employees going out and checking on
4 Jay Barlogi when he decides to open a headgate, or are
5 you talking about something different?

6 How would -- whether your old efficiency
7 approach is used or whether the Department's current one
8 is used, how would you operationalize that in context of
9 the delivery call?

10 A. Well, you know, by -- back then and now, I'm
11 not suggesting that the Surface Water Coalition members
12 must operate at these levels. What I'm proposing under
13 this methodology that the project efficiencies be
14 evaluated as to whether they're reasonable and adjusted,
15 if necessary -- or I think it would be necessary to
16 adjust them. But even if you did that, it just becomes
17 part of the analysis to determine whether they're short
18 or not and then whether that shortage requires
19 mitigation.

20 So if they want to continue to operate at a
21 lower efficiency level because it's easier to operate
22 their systems and they want to continue their customary
23 ways, I have no objection with that. But it does bother
24 me when junior groundwater users are forced to curtail
25 in order to maintain that continued less-than-efficient

1 operation.

2 Q. Well, in your report, did you prepare an
3 alternate approach to propose to the Department to
4 determine project efficiencies for the Fifth Methodology
5 Order?

6 A. I did. And so I developed an alternate
7 approach. My preference would still be to -- my number
8 one preference would be to use the -- you know, use
9 these reasonable efficiencies or approach the problem in
10 that way and consider the reasonableness of efficiencies
11 and apply some industry standard techniques to determine
12 efficiencies that are potentially more reasonable.

13 But if the Department doesn't want to go
14 there, then I've developed an alternative that would
15 kind of work within the current framework but apply some
16 additional sort of analysis and checks for how those
17 monthly efficiencies are used.

18 Q. Is that described on -- or does that start --
19 that discussion start on page 14 of Exhibit 347A?

20 A. I think it's on 13.

21 Q. Page 13. Okay. I just wanted to note that
22 for the record.

23 And then do you have some illustrations of the
24 discussion that you have starting at page 13, maybe
25 starting at Figure 3-4 in the back?

1 A. Yes. I prepared a series of graphs, so
2 there's -- it's all the way from 3-4 to 3-18, 3-19. But
3 within those, there's basically two sets of graphs. So
4 in this first set of graphs that we're going to talk
5 about, I've plotted the annual diversions of the Surface
6 Water Coalition members during 2007 to 2021 against the
7 annual crop water need.

8 Q. So this is -- we're looking at Figure 3-4
9 right now; is that correct?

10 A. Yes.

11 Q. So what do you conclude from the plots that
12 you created in Figure 3-4?

13 A. Well, so what I'm showing in Figure 3-4 is
14 these are annual -- so it's the annual diversions
15 plotted against the annual crop water need in a -- what
16 I call a scatter plot, XY plot. And those are the dots
17 that are shown for each of the Surface Water Coalition
18 members.

19 And then I've also drawn a trendline, best fit
20 line, through the points, and that's the colored, dotted
21 line that's the same color as the dots.

22 And then for just comparison purposes, I also
23 plotted this black line. What the black line is is
24 taking the annual crop water need divided by the average
25 annual efficiency in the Methodology Order.

1 So this depicts on an annual basis what you
2 would compute as an annual diversion demand from the
3 annual crop water need and the annual efficiency. And
4 you can see, even -- we'll look at this on a monthly
5 basis, too, in a minute -- but even on an annual basis,
6 you can see that the black line for -- is, in all cases,
7 steeper than the trendline, and in some cases much
8 more -- some cases much more steep.

9 And so what that indicates is that this
10 calculation involving crop water need and efficiency is,
11 basically, predicting a diversion demand, and it's
12 predicting a relationship between the diversion demand
13 and the crop water need that is different than what is
14 actually present in the data.

15 So the data shows -- you know, you can see
16 this in an extreme way, you know, under AFRD2, for
17 example, that their diversion -- and that's with the
18 purple dots in the upper right -- that those purple dots
19 and the line drawn through them are relatively flat.
20 And so, you know, even when the crop water need is
21 changing, they're just diverting, more or less, the
22 same -- a similar amount every year; whereas, the black
23 line would -- you know, and the Methodology Order
24 suggests that it ought to be going up and down, and
25 that's sort of an implied part of the Methodology Order.

1 Q. Okay. Do we need to look at each of the
2 individual companies, Figures 3-5 through 3-11, or can
3 you kind of maybe highlight a couple of them that are --

4 A. Yeah, we might do that, you know, flip through
5 some of them.

6 One thing I would also say about Figure 3-4
7 and point out is the amount of scatter in those dots.
8 And so, you know, that as the crop water -- for the same
9 crop water need there might be a diversion, you know,
10 even for just using -- like, I don't know, what's a good
11 one? -- Milner, for example, you know, with a crop water
12 need of 30,000 acre-feet, we see that they diverted
13 50,000 acre-feet in one year and then as much as
14 65,000 acre-feet in another year. So you just have a
15 lot of scatter in this data.

16 So then moving on --

17 Q. Why don't you pick out a company or a canal
18 and let's --

19 A. Well, I think like A&B, for example, that's
20 the next one, there's a -- you know, you can see that --
21 and this is the same information on these next set of
22 charts as I was just talking about, only in this case,
23 it's annual -- I mean, it's monthly data for each of the
24 users.

25 Q. And so you're starting with Figure 3-5?

1 A. Figure 3-5. So this is A&B. So here I'm
2 plotting the monthly crop water need versus the monthly
3 diversions, and I've got a graph for each month. So the
4 graph in the upper-left is April, and then to the right
5 is May, and then going down to the left is June, July,
6 August, September, and October, finally, at the bottom.
7 And each of those, again, I'm plotting, with the dots,
8 the crop water need -- monthly crop water need versus
9 monthly diversion and plotting a trendline through it.

10 And for A&B, you know, which is a user that I
11 think operates pretty efficiently, you can see that
12 there is a pretty good correlation between what they
13 divert and the crop water need. And those trendlines
14 are, you know, not too far off the theoretical line,
15 which is the black line, you know, the crop water need
16 divided by the project efficiency.

17 Q. Basically, the black line shows what is being
18 administered --

19 A. Yes.

20 Q. -- correct?

21 Okay.

22 A. But for other of the users it's not -- it's
23 different. And it can vary by month. And some months
24 it line s up pretty good, and other months it could be
25 way off.

1 So, like, for example, on the next one, the
2 next graph, 3-6, when you look at May for AFRD2, you've
3 got those orange dots, and the trendline through them
4 has a much flatter slope than the black line would
5 suggest.

6 And then just flipping through the rest of
7 these BID, Milner, you see a similar looking situation
8 where you've got -- sometimes the trendline lines up
9 with the black line, but at other times it doesn't. And
10 in a lot of cases you still have a lot of scatter, too.

11 Q. So does this -- what does this tell us about
12 the crop water need divided by project efficiency term
13 as a predictor of diversion demand? Or does it tell us
14 anything?

15 A. Well, it doesn't -- it tells me that it's not
16 a great predictor. It's not the -- you know, the crop
17 water need divided by efficiency is not the only thing
18 that's going into what they're diverting.

19 Q. So can we move now to Figure 3-12?

20 A. Well, I would just note, then, with the last
21 couple of them, North Side and Twin Falls, you can
22 see --

23 Q. And those are Figures 3-10 and 3-11? I
24 apologize --

25 A. Yes, 3-10 and 3-11 where -- you know, and for

1 these users, you know, you see that -- quite a lot of
2 mismatch in many or most of the months where what they
3 divert is -- seems to be a lot less -- what they divert
4 is a lot less sensitive to the crop water need than the
5 relationship in the Methodology Order would suggest it
6 ought to be, a black line.

7 Q. Now, I do have a question for you.

8 At the top of each of these graphs from 3-5 to
9 3-11 there's some blue text that says: "Exclude Project
10 Efficiency Outlier Months (>+/-2 Standard Deviations)."

11 What does that refer to?

12 A. Well, that's a filter that the Department had
13 put on when they were -- when it was evaluating these
14 monthly efficiencies, that it was excluding the
15 outliers. So I follow that same procedure to also
16 exclude those.

17 But that's a good point, in that there's
18 values that are straying even further -- historical
19 values that are straying even further from the data that
20 I have plotted on here that aren't plotted.

21 Q. Okay. So can we move on to this next group of
22 graphs starting at Figure 3-12?

23 A. Yes.

24 Q. So this is titled -- these are a series, I
25 think, by company -- or member, rather, titled, "Annual

1 Project Efficiency v. Annual Crop Water Need."

2 What are we seeing in Figure 3-12 through
3 3-19?

4 A. So this is a comparable set of graphs. So
5 this first graph, 3-12, is one where I'm plotting the
6 annual project efficiency versus the annual crop water
7 need for -- and this is back on a graph where I've --
8 this graph where I've got a separate graph on this
9 figure for each of the Surface Water Coalition members,
10 the seven members.

11 So I'm plotting their annual project
12 efficiency computed from the data against the annual
13 crop water need.

14 Q. Okay.

15 A. And then similar to the last discussion or the
16 last set of figures I was discussing, then I have some
17 additional figures where I show the monthly values for
18 each of the Surface Water Coalition members on separate
19 pages.

20 Q. So can we pick out some of the monthly graphs
21 that have strong correlations between project efficiency
22 and crop water need?

23 A. Yes, I can do that.

24 And then also I would note that for each of
25 these trendlines drawn through the data, I've got the

1 equation for the trendline and also the R-squared value
2 for how good of a fit that trendline is through the
3 data.

4 And so when I -- I considered a good
5 relationship is when the R-squared was at least -- was
6 above .5.

7 Q. Okay.

8 A. And so you can go through these and --

9 Q. Why don't you pick one or two, based on your
10 professional understanding, then, of which ones would be
11 significant. And then --

12 A. Well, there's, you know -- like, on A&B you
13 can see that, you know, there's -- like, April and June
14 there doesn't seem to be much relationship.

15 Q. Tell us which figures you're looking at.

16 Sorry.

17 A. Oh, sorry. Figure 3-13.

18 Q. Okay.

19 A. Like, when you have a lot of spread in here,
20 and there's not a good relationship, that suggests to me
21 that they're operating probably at a higher level of
22 efficiencies. And actually some of them vary -- the
23 scatter that you're seeing in this plot, it reflects
24 water that's going either into or coming out of soil
25 moisture to meet the crop water need. And that's not

1 part of the calculated efficiency, and that would be a
2 reason you'd get more scatter. If you could build that
3 into the analysis, I think some of this would tighten
4 up.

5 Q. So, actually, a poor R-squared in these
6 graphs, 3-12 through 3-19, is an indicator of,
7 potentially, good operational efficiency?

8 A. Probably operating at higher -- closer to the
9 higher end.

10 Q. Okay.

11 A. Or at a more reasonable level.

12 Q. So if we go through these and find the graphs
13 that have low R-squared, that would be an indication, in
14 your professional opinion, that the operations are what?

15 A. Tend to be more efficient than not.

16 Q. So then if we go, for example, to 3-14, and we
17 see AFRD No. 2 in July, R-squared .86, what does that
18 tell you?

19 A. Well, so that tells me that their project
20 efficiency is changing with the crop water need, which
21 that, just by itself, doesn't make a whole lot of sense
22 to me, that -- if you're operating at a reasonably high
23 level of efficiency, your efficiency should be roughly
24 the same or near the same regardless of what the crop --
25 the variation in the crop water need has been in that

1 month.

2 And if the crop -- if the efficiency is going
3 up as the crop water need or the crop consumptive use
4 increases, that suggests to me that they're diverting an
5 excess of what they need. And the reason the efficiency
6 is going up is because the enumerator is just getting
7 larger and larger with the higher crop water use.

8 Q. Okay. Well, before we tie a bow on this, what
9 else -- is there anything else that you would like to
10 mention about these tables, 3-12 through 3-19 -- I'm
11 sorry, Figures 3-12 through 3-19?

12 A. Well, just -- I mean, just because -- you
13 know, I did note, like, for some of the users like
14 North Side and Twin Falls, who we've been talking a lot
15 about, you know, turning to the Twin Falls page,
16 Figure 3-19, you can see that there's a pretty strong
17 relationship now for them -- for Twin Falls and an
18 R-squared much greater than .5 in all of the months but
19 April. That -- that suggests to me that Twin Falls is
20 probably, you know, operating at -- diverting more water
21 than they need, and the only reason their efficiency is
22 changing is because that numerator is changing.

23 Q. And remind us what the numerator is again?

24 A. When you're computing the efficiency, it's
25 the -- the crop irrigation requirement, the CIR, times

1 the acres, and that's the crop water need.

2 And so as -- you know, in a hotter, drier
3 year, that -- the crop water need will be greater, so
4 that numerator becomes greater.

5 But you can imagine -- just for a simple
6 example, then, if they divert the same amount of water
7 every year, just in a hypothetical, and the crop water
8 need is different every year, and you're always
9 diverting enough water that the numerator stays the same
10 and -- no, wait -- the denominator stays the same and
11 the numerator, the crop water need, is changing from
12 year to year, then you'll get that perfect relationship;
13 that the computed efficiency will go up in lockstep with
14 the crop water need.

15 And that's a reflection of the actual
16 efficiency, but it's also a reflection that they're not
17 operating at a reasonably high efficiency level, at
18 least in those years where the efficiency -- the
19 computed efficiency is lower.

20 Q. Okay. Well, what would you propose that --
21 what would you propose for the Department to do with all
22 of this information?

23 A. Well, I guess, for one, I wish they would just
24 consider it, you know, and apply some sort of -- take
25 this information and think about what it reflects and

1 whether the efficiencies that are used in the
2 methodology are reasonable or can be modified to
3 consider this information.

4 And I have -- I've proposed a couple of
5 alternatives as a couple of many potential things that
6 you could do.

7 So what I propose, then, is based on this
8 information that I was just talking about. It appears
9 that at least for -- you know, for many of the members
10 and in some or many of the months, there is a good
11 relationship between the monthly project efficiency and
12 the crop water need and -- even though I think it would
13 be better to use that relationship just as a small fix
14 than to just use a fixed average value in the
15 Methodology Order.

16 And so what I propose, then, as one small fix
17 would be that for the situations where we have an
18 R-squared that's more than .5, that you would use that
19 regression equation to compute the project efficiency.

20 Q. And what regression equation is that?

21 A. It's the regression equation that's shown on
22 each of these -- in figures --

23 Q. So give us an example.

24 A. Yeah.

25 Q. Let's look at Figure 3-19, for example.

1 A. Okay. So let's go -- let's say for June --
2 this is Twin Falls. So for June we have a -- that's the
3 second graph down on the left. It's with the green
4 dots.

5 So that -- the trendline, that's the
6 regression line I'm talking about. It has -- the
7 equation for that line is over on the left with the
8 R-squared of .781. So I would propose that you would
9 use that line -- or that regression equation to compute
10 the Twin Falls efficiency in June and for all of the
11 other months that the R-squared is greater than .5.

12 But I would also propose that in addition to
13 that, that you would establish a floor, and you would
14 allow -- the efficiency that you would compute would be
15 no lower than the average. And so that would prevent,
16 then, you from using, in the methodology, these very,
17 very low efficiencies on the lower end.

18 Q. So give us an example of one that you think is
19 too low?

20 A. Well, let's go to, like, September, for
21 example. September has efficiencies that are ranging
22 from -- you know, that's the -- with the purple dots
23 ranging from, you know, roughly, 12 percent up to
24 40 percent.

25 So I would propose that you would use that

1 regression line, but you would have the floor for what
2 you would compute, from that regression line, be the
3 average, or at about 25 percent.

4 Q. Oh, the average of the purple dots in
5 September --

6 A. Yeah.

7 Q. -- would be the floor?

8 A. Would be the floor.

9 And then you would go up on that line from
10 there.

11 Q. Okay. And so if you use -- and the regression
12 business is beyond me, I'll admit.

13 So if you're using the regression to compute
14 the efficiency, what are you not using?

15 A. Well, you're not using just a fixed monthly
16 value, average value, all the time.

17 Q. Which is what IDWR does now?

18 A. Yes. And so this would result in -- in months
19 with a higher crop water need, you would use a higher
20 efficiency. And that is -- you know, that's actually
21 reflected in the historical data. So in that case, I'm
22 not applying any of my reasonableness test or anything,
23 I'm just working within the historical data.

24 Because what happens in the methodology now is
25 that if you get -- if you use the average efficiency and

1 it's a year with a -- or a month with a relatively high
2 crop water need, you compute that average efficiency
3 into the crop water need, and you end up with a
4 diversion that's actually greater -- a diversion demand
5 that's greater than what they actually diverted in that
6 year.

7 Q. Oh, I see.

8 A. So it inflates it to more than what they
9 historically diverted.

10 Q. Okay. I see.

11 Now, did you prepare any kind of -- I'm going
12 to call it a hindcast to evaluate this proposal?

13 A. Yeah. Well, there's one more piece that we
14 didn't talk about, and that's what to do when the
15 R-squared is less than .5.

16 Q. Oh, right. I'm sorry.

17 A. So when the R-squared is less than .5, then
18 I'm proposing that -- well, let's not use a regression
19 equation, but we can just use a fixed value -- but I
20 would propose that we would -- rather than using the
21 average value, we should use like a -- and I'm proposing
22 the 75th percentile value. So it's a value on the, you
23 know -- well, at the 75th percentile, so it's not the
24 highest they've shown they can operate at, stepping back
25 down, right in between the average and the highest

1 values.

2 Q. So could we look at Figure 3-16 for a minute,
3 that's Milner. Milner has a mixture of months that are
4 -- for which the R-squared is below .5 and above .5.

5 So using Milner as an example, would it be --
6 would that mean that, for example, April where the
7 R-squared is .13, what would you do in that month for
8 purposes of an efficiency for the Methodology Order?

9 A. Well, in all of these when the R-squared is
10 less than .5, you would just pick a value that's at the
11 75th percentile level; so in other words, excludes the
12 upper one-quarter of the highest efficiencies.

13 Q. So pick one of the blue dots that's between
14 the 50 percent and the 100 percent?

15 A. Yeah. I mean, April is not -- April is sort
16 of -- let's not talk about April. April is kind of a
17 weird month, and particularly for some of these users,
18 where the reason we get these efficiencies that are
19 greater than 100 percent is in -- some of the -- in the
20 early months is that you can have a situation where
21 they're only diverting for part of the month. So you've
22 got a partial month diversion compared to a full month
23 crop demand, so when you do that division, you can end
24 up more than 100 percent.

25 Q. Oh, I see.

1 A. And that's because, you know, some of the crop
2 demand is being met by soil moisture that's stored over
3 the winter or from the previous season. So that's
4 why --

5 Q. Well, can we talk about June, then?

6 A. Yeah, June. So, you know, just eyeballing
7 what the 75th percentile here might be through those
8 points would be, you know, maybe 60 percent, 65 percent
9 or something like that. So higher than the average but
10 not as high as, you know, the 75 or 80 percent that
11 they've shown they have operated at in the past.

12 Q. So the 75th percentile not the 75th percent?

13 A. Yeah, the 75th percentile.

14 Q. Okay. Can we move to Tables 3-1 and 3-2 to
15 talk about the hindcast?

16 A. Yes.

17 Q. Okay.

18 A. So --

19 Q. Let's start with 3-1.

20 A. So I did a -- I did this hindcast analysis,
21 but I just picked out -- I did it for two examples. I
22 didn't have time to do it for all of the Surface Water
23 Coalition members. So Table 3-1 is a summary of the
24 results of the hindcast analysis that I did for the
25 Twin Falls Canal Company.

1 Q. And let me just stop you and ask you to go
2 through the columns, but when you get to Column 5, talk
3 about how this matches up with past orders.

4 A. Okay. So what -- this table represents an
5 annual summary of the analysis that I did. But the
6 analysis is done on a monthly basis, so this is just
7 adding up the monthly results into annual values.

8 Excuse me. So this was done for -- this
9 analysis was done -- the hindcast analysis for 2007 to
10 2021.

11 So in the first column is the annual, the sum
12 of the monthly crop water need values or the annual crop
13 water need, so that's the acres that the Surface Water
14 Coalition members have reported times the CIR, crop
15 irrigation requirement, for that month based on the
16 crops that were grown and the like. So that's the same
17 value that that reflected. These are the values being
18 used by the Department.

19 The next column, which I guess is also
20 Column 1, "Adjusted Historical Diversions." So these
21 are the historical diversions that the Department used
22 in their analysis. It says "adjusted" because they've
23 been adjusted for the rentals and things for water that
24 was diverted but not actually used for irrigation.

25 And then there's the -- this is the -- I have

1 the November 1 forecast supply so that -- the other
2 thing that you should understand, and this reflects the
3 hindcast analysis that would be done in November. So
4 it's -- you're looking -- the forecast supply -- I mean,
5 the supply is based not -- this is -- sorry.

6 Q. It's actual for the year?

7 A. It's actual for the year. And I'm using the
8 term -- the column headings that the Department uses, so
9 it's not really a November 1 forecast. Earlier in the
10 year, it's partially a forecast. In the beginning of
11 the year, it's wholly a forecast. But at November 1,
12 you're using what they actually -- their actual natural
13 flow diversions plus what their storage allocation was
14 for that year, and that's their supply.

15 Q. So just to make sure it's clear, this 3-1 is
16 based on an analysis that the Department does?

17 A. In part --

18 Q. Yeah.

19 A. -- and these first three columns I'm talking
20 about is the Department's data.

21 Q. Okay. Thank you.

22 A. So then the next set of columns is titled --
23 it's under the combined heading of "Annual RISD," or
24 reasonable in-season demand, and so I computed that
25 three different ways. So the first column, it's -- it's

1 the column with the "2" above it -- "CWN Divided By
2 Methodology Order 5 Project Efficiencies." That's where
3 I've computed the -- you know, on a monthly basis, I
4 computed the diversion demand based on the crop water
5 need divided by the Department's average monthly project
6 efficiencies, and I did that for each month and then
7 added them up in this table.

8 And importantly, though -- and I'll talk about
9 this more in a little bit -- I'm using the current
10 15-year average monthly project efficiencies that are in
11 the Methodology Order in every year.

12 Q. Okay.

13 A. And that's a little different than what the
14 Department did in its hindcast analysis, so keep that in
15 mind.

16 And then under Column 3, this is one of the
17 two alternative formulations that I had -- that I had
18 proposed. So in this Column 3-1 is where I computed the
19 monthly diversion demands based on the crop water need
20 divided by the efficiency, and the efficiency was
21 computed using that reference -- I'm sorry -- that
22 regression equation. And then when the R-squared was
23 less than .5, I used the Department's average monthly
24 project efficiency.

25 Q. So Column 3 implements part of the discussion

1 we just had about the R-squared values on the
2 Tables 3-12 to 19?

3 A. Yeah.

4 Q. Okay. Thanks.

5 A. And then Column 4 is the same except rather
6 than -- in the months where the R-squared is less than
7 .5, then I used the 75th percentile.

8 Q. More than .5, you mean?

9 A. No, when the R-squared is less than .5, I used
10 the 75th percentile project efficiency instead of the
11 average project efficiency. That's just the little
12 difference between those two.

13 Q. Okay.

14 A. So then when you get -- the results, then, are
15 shown over in the next set of columns. It's the
16 "November 1 Reasonable in-Season Demand Shortfall." And
17 here I've just calculated the shortage, which is based
18 on Columns 2, 3, or 4 minus the forecast supply, which
19 is the November 1 forecast supply column.

20 Q. I see. Okay.

21 A. And so in Column 5, this is what I get from
22 the Methodology Order, and this is -- if you compare
23 these numbers to the numbers that were in the
24 Department's hindcast analysis, you'll see that they're
25 the same, actually, in 2021 -- that shortage, the

1 179,066 -- but the Department has some different numbers
2 in the above rows, and that's because the Department
3 was -- used -- rather than -- the Department in their
4 hindcast analysis didn't use the current methodology
5 average efficiencies in every year.

6 They computed a new rolling average in some of
7 the years, and then in the earlier years, they were
8 using a fixed number that was based on a -- some prior
9 number, prior average. So suffice it to say, anyways,
10 that that's the reason why so many shortages -- the
11 shortages that I have here are a little different than
12 what the Department had computed.

13 Q. Okay. And --

14 A. And then just for -- then, for comparison
15 purposes, then I've got the shortage for those two
16 alternatives that I picked out -- that I had identified.
17 And you can see that, in these cases when there's a
18 shortage, by implementing just those very, like, modest
19 changes to how you compute the efficiencies and, you
20 know -- and those modest changes are still working
21 within the efficiencies that the Surface Water Coalition
22 members have been operating at. But just making some
23 small changes, you can see that you get some, you know,
24 fairly big swings or changes in some cases in what the
25 shortage is.

1 And that's -- you know, that's indicative of
2 just an overall observation that I have, is that this
3 method is very sensitive to what you use for the project
4 efficiencies just as a general matter because we're
5 operating on the margin here when computing these -- you
6 know, comparing this forecast supply to what their
7 diversion demand is. So, you know, at that margin small
8 changes in the efficiencies can make or break whether
9 you have a shortage or not.

10 Q. Let's go on and look at Table 3-2. This is
11 titled, "Summary of Annual Reasonable in-Season Demands
12 and Shortages for AFRD2."

13 What is this showing us, Table 3-2?

14 A. It's the same thing that I was -- for AFRD2
15 that I was just talking about for Twin Falls. I went
16 through the same analysis only this is for AFRD2.

17 And, again, it shows that by implementing
18 these modest changes that you can have some effect on
19 the computed shortages.

20 Q. So do you have a summary opinion here about
21 the modifications you've offered for the Department's
22 use of the project efficiency values in the Methodology
23 Order?

24 A. Well, you know, again, as I said earlier, my
25 preference would be to apply a reasonableness test, as I

1 talked about, but maybe we're -- maybe we take baby
2 steps. So at least it's just a small step in the right
3 direction. I think the methodology would be improved by
4 using -- employing the proposal that I have regarding
5 the progression equation and 75th percentile
6 efficiencies, to use those in the methodology rather
7 than the averages that are currently being used.

8 Q. Let's switch gears and talk a little bit about
9 irrigated area.

10 This probably is old news by now, but just
11 remind us what are the irrigated acreage values used for
12 in the Methodology Order?

13 A. Well, they're used in two different ways
14 actually. They're used to compute the crop water need,
15 like I was just talking about. So in each month in the
16 methodology, you take the irrigated area times the CIR
17 for that month, you know, based on the actual climate
18 conditions, weather conditions in that month, to compute
19 what the crop needs for each of the members. And
20 that's -- that's part of determining the demand for the
21 members.

22 And then the irrigated area is also used in
23 the derivation of those project efficiencies because the
24 historical project efficiencies are based on crop water
25 need divided by -- historical crop water need divided by

1 historical diversions.

2 Q. So we've heard testimony from several
3 witnesses about the irrigated acres numbers that are
4 used by IDWR.

5 Is it your understanding that IDWR scrutinizes
6 the acreage figures that are provided by the companies?

7 A. No. Based on what we heard, they really don't
8 provide any scrutiny.

9 Q. And we've heard testimony that the acreage
10 numbers are based on either a permanent place of use or
11 shapefiles that were created some time ago; correct?

12 A. Yes.

13 Q. At the technical work group, did IDWR present
14 their own analyses of irrigated areas?

15 A. They did. As kind of incidental to some of
16 the information they were showing us, they had provided
17 some analysis of irrigated area for each of the Surface
18 Water Coalition members based on aerial imagery and
19 remote sensing analysis of the members.

20 Q. Do you remember what years they were --
21 presented their own data for?

22 A. It was 2011, 2017, and 2021.

23 Q. Okay. And do you recall how the Fifth
24 Methodology Order acres compare with what IDWR's
25 irrigated land set determined for 2011, 2017, and 2021?

1 A. Well, for some of them, they were -- you know,
2 the methodology acres were, you know, close to or even
3 less than the remote sense data. And I think that's
4 because some of the remote sensing includes some
5 additional areas or double-counted areas and all.

6 But for three of the users in particular, the
7 methodology acres were significantly greater than the
8 acreages that the Department had presented in their
9 analysis. And those users are Burley, Minidoka, and
10 Twin Falls.

11 Q. So -- and let's take Twin Falls as an example
12 because we've talked a lot about Twin Falls the last few
13 days.

14 What would be the effect if the Methodology
15 Order incorporated IDWR's irrigated lands set acreage
16 instead of the shapefile Twin Falls provides?

17 A. Well, it depends. Because if you -- if you
18 insert the revised acres, keep everything else the same,
19 then you can easily see that you compute a lower crop
20 water need. Take CIR times the lower acres divided by
21 the same efficiency, you get a lower demand.

22 And I say "it depends" because if you
23 actually -- if you took the lower acres and then
24 multiplied it by the CIR divided by the historical
25 diversions and go recompute your efficiencies, then

1 you'd end up in the same place. Because if you took
2 your lower acres, computed the lower efficiencies, and
3 then stuck those lower efficiencies back in order, you'd
4 end up with a diversion demand that's exactly the same.

5 Q. So it's kind of a feedback loop?

6 A. Yeah. And so that's why I say it depends.

7 And, to me, I mean, to put in lower acres and
8 then to suggest, well, we'll just lower the efficiencies
9 and move on, that doesn't make any sense to me.

10 Q. That's what the Surface Water Coalition
11 expert, Chuck Brockway, suggests, though; right?

12 A. Yes.

13 Q. As the fix for all of this?

14 A. Yes.

15 Q. Just reduce the acres, but also recalculate
16 the project efficiency.

17 But then they end up with the same demand --

18 A. Yeah.

19 Q. -- correct?

20 A. Yeah.

21 Q. Do you -- despite that problem, which you've
22 talked about, I think, at some length related to your
23 recommendations on how the Department could use project
24 efficiencies differently, what would be -- would it be
25 preferable for the Department to use its irrigated lands

1 dataset?

2 A. Yes. I mean, I think that data is far more
3 reliable than what they're getting from the -- from the
4 Surface Water Coalition members based on those old
5 shapefiles with no scrutiny applied to it.

6 And I'd be reasonably certain that the acres
7 that are determined by the Department are acceptable
8 for -- to use in the methodology.

9 Q. So if there was to be a -- I mean, in the
10 context of a challenge to the reliance on the shapefile,
11 as an expert, then, you'd be comfortable relying on the
12 IDWR dataset rather than the shapefile file dataset as
13 far as showing acres that are actually irrigated?

14 A. Yes. And we heard some discussion that, well,
15 maybe there's some examples in IDWR analysis that
16 there'd been some acres that were misclassified or --
17 well, I mean, you could fix those. Right?

18 I mean -- and if you were going to use the
19 IDWR analysis, well, then provide it to everyone, and
20 everyone can look at it and suggest where it be fixed,
21 and we end up with a much, much better irrigated acres
22 dataset to use in the analysis.

23 Q. So the Department runs the Methodology Order
24 every year. Would they need to update the irrigated
25 area dataset every year?

1 A. No, I don't think so.

2 Q. Why not?

3 A. Well, I mean, acres do change a little bit
4 from -- can change from year to year. But, I mean, in
5 my experience, and particularly for these and for large
6 irrigation systems, there may be some long-term trends
7 in acreage because of urbanization and things like that.

8 But for these particular members that all have
9 excellent water supplies that they generally are
10 irrigating, you know, largely as much as they can and --
11 but not -- in all systems there's some lands that get
12 fallowed for various reasons, but in my experience,
13 while it's different lands that are going in and out of
14 the fallowing, the overall amount of fallowing is
15 roughly consistent from year to year.

16 Q. And, in fact, isn't that what we see in the
17 20 -- comparing 2011, 2017, and 2021 irrigated lands
18 datasets? They're pretty similar, aren't they?
19 179,000, 187,000 for Twin Falls?

20 A. Yeah, they're all kind of in that same range,
21 plus or minus a thousand acres or so. So that suggests
22 to me that what the Department's doing is reliable and
23 repeatable and should be used.

24 Q. Okay.

25 MS. KLAHN: Mr. Director, it's 3:00 o'clock,

1 and I have probably 30 minutes more. We can push
2 through or we could take our afternoon break.

3 HEARING OFFICER: Thanks for the suggestion.
4 I think we should break. We've been at it two hours.
5 Let's break for 15 minutes. Come back at quarter after.

6 (Break taken.)

7 HEARING OFFICER: Back on the record. We're
8 recording again after afternoon recess.

9 Ms. Klahn.

10 MS. KLAHN: Thank you.

11 Q. (BY MS. KLAHN) All right. Mr. Sullivan,
12 let's switch gears and talk about your opinions related
13 to the incorporation of supplemental groundwater
14 considerations into the methodology.

15 How does the Fifth Methodology Order -- how
16 does the Fifth Methodology Order consider supplemental
17 groundwater?

18 A. Well, I think it's one of the -- supplemental
19 groundwater uses is one of the things that can be
20 considered in the methodology in terms of a supplemental
21 supply or in the acres that are irrigated with
22 supplemental groundwater.

23 So there's a framework to allow that to be --
24 that sort of information to be utilized, but, to my
25 knowledge, it never has.

1 Q. And supplemental groundwater is one of those
2 things that the district court has said could be
3 incorporated if the standard is clear and convincing
4 evidence; correct? Is that your understanding?

5 A. Yes.

6 Q. Okay. Do you have an understanding of why
7 IDWR hasn't attempted to incorporate supplemental
8 groundwater use into the demand determinations?

9 A. Well, I think they've said that they just --
10 they don't have an ability to do that or good enough
11 information to do that. And I mean -- and they've been
12 saying that for 15 years. And, you know, we've been,
13 you know, asking about it and suggesting that it ought
14 to be incorporated.

15 In fact, in a -- that was one of my specific
16 comments that I gave in the 2015 technical working
17 group, is that they consider that. And I suggested that
18 again in the latest one, the 2021 technical working
19 group.

20 And they keep saying they don't have enough
21 information. And I think -- I mean, we've heard some
22 testimony earlier that -- or based on some questioning
23 earlier suggesting that -- I mean -- and I agree with
24 this, the Department has water rights information --
25 detailed water rights information, they have pumping

1 information. They have an ability to use that
2 information to come up with reasonable estimates of
3 supplemental groundwater use.

4 And, you know, it's not going to be perfect,
5 but in this business nothing's ever perfect. And you
6 can make reasonable estimates. And there's -- the
7 problem is, now, by completely ignoring the supplemental
8 irrigation we know there's a bias one way. We're not
9 even attempting to correct that bias by considering the
10 supplemental groundwater use that we know is occurring.

11 Q. And during the original Surface Water
12 Coalition delivery call hearing in 2008, did the Surface
13 Water Coalition members submit supplemental pumping
14 information in relation to a request from the Director?

15 A. Yes. Director Gray requested a bunch of
16 information from the Surface Water Coalition members;
17 one piece of which was how much supplemental groundwater
18 acreage they had or within their boundaries. And so
19 the -- most of the members or all of the members did
20 submit that information.

21 And I had tabulated that in my expert -- my
22 original expert report. And that was information from
23 them, so it seems like that would have been easy to use
24 the information they submitted, but it wasn't used.

25 Q. Let's move on to talk a little bit about --

1 well, let me just close the loop on that.

2 Did you have time to do an evaluation of the
3 supplemental groundwater use from the Surface Water
4 Coalition?

5 A. No, I did not.

6 Q. Okay. So let's talk a little bit about the
7 change in the Fifth Methodology Order from steady state
8 to transient modeling.

9 How would you characterize the shift from
10 steady state to transient groundwater modeling in the
11 Fifth Methodology Order?

12 A. Well, it's a sea change in procedure, and it
13 results in a drastic change in the priority date for
14 curtailment compared to what was being done previously.

15 Q. Do you have an understanding of why IDWR made
16 the shift in 2023 from steady state to transient?

17 A. Well, I think they gave three reasons. There
18 were at least three reasons. One of which was that they
19 had a better understanding of transient and steady state
20 modeling and how they could be used in the methodology.

21 That struck me as kind of curious because --
22 and I didn't quite understand that reasoning, because
23 everyone is well aware of the difference between
24 transient and steady state modeling and the use of the
25 modeling and -- in the methodology. So it didn't seem

1 like there's anything new there.

2 I mean, so -- and then a second reason they
3 gave is that now we have -- the ESPAM model is a monthly
4 model, it has monthly stress periods, and so now it can
5 be used in a transient way. But we've had a monthly
6 model for a long time, and -- so why all of a sudden it
7 should be now used for transient instead of steady
8 state, that didn't -- I didn't quite understand that.

9 And then the last one was also one I
10 questioned, I guess. And that was that they needed to
11 determine curtailment dates with the steady state -- or
12 the transient model so that curtailment would provide a
13 backstop in providing wet water to the seniors in the
14 event that the juniors don't mitigate -- don't mitigate
15 enough -- and don't mitigate enough to meet the
16 shortage.

17 And, I mean, to me, I didn't -- I don't
18 know -- that doesn't make a -- well, I don't agree with
19 that, I mean, for a number of reasons. I guess one is
20 that I think if there's -- I mean -- and I'm not a
21 lawyer, obviously, but if there's a mitigation order,
22 there should be an expectation that the juniors will
23 comply with it, and if they don't, there should be
24 penalties for not complying with it, or curtailment.
25 And that's the way it works where I come from in

1 Colorado.

2 And then, further, it's -- curtailment as the
3 mechanism for conjunctive administration is horribly
4 inefficient. You know, especially for an aquifer as
5 vast as this, you have to curtail so much pumping to
6 produce relatively little amounts to the seniors, you
7 know, where they divert it, so...

8 Q. So in the Fifth Methodology Order, which I'm
9 sorry -- I'm sorry, in Exhibit 301, which is the
10 April 1st As-Applied Order, the curtailment date, I
11 believe, is sometime in 1953; correct?

12 A. Yes.

13 Q. And so how much -- if curtailment was the
14 reason for imposing the transient model approach, how
15 much curtailment would it require to produce the
16 75,000 -- approximately 75,000 acre-feet of shortage by
17 curtailing to 1953 priority date?

18 A. Well, if I'm --

19 Q. Approximately?

20 A. Yeah. What I recall is that for that -- the
21 curtailment run that Jennifer made to determine the 1953
22 curtailment date, she was curtailing, roughly,
23 700,000 acres of groundwater use and 1.7 million
24 acre-feet of groundwater consumptive use. So curtailing
25 1.7 million acre-feet of consumptive use to produce

1 75,000 acre-feet to the near Blackfoot to Minidoka
2 reach. So I didn't do that math, but that's a very,
3 very small percentage of the water that's curtailed
4 that's going to reach that reach this year.

5 Q. So if you curtailed 700,000 acre-feet in order
6 to achieve 75,000 acre-feet in the Blackfoot to Minidoka
7 reach and the total CU curtailed is 1.4 million
8 acre-feet, what happens to the other 1.325 million
9 acre-feet of curtailed consumptive use? Where does that
10 show up?

11 A. I think those numbers -- those are -- the
12 numbers we talked about, that's not the right numbers.
13 They're actually curtailing 1.7 million acre-feet.

14 Q. Okay. So 1.7 acre-feet, sorry.

15 A. So they're curtailing 1.7 million acre-feet,
16 so 75,000 acre-feet will show up in the reach this year,
17 and the other -- was it 1.625 million acre-feet? -- will
18 either come back to different reaches this year,
19 different reaches of the Snake River, or it will come
20 back this winter, or the majority of it is just going to
21 come back in future years.

22 So that 1.7 million acre-feet will come back
23 to the river, and so -- you know, just -- then it sort
24 of begs the question, well, what's going to happen with
25 that water? And it seems to me that that, potentially,

1 just provides a windfall to all these other reaches and
2 users and later in time, and so you -- and that doesn't
3 seem a very good use of the resource. And that's why
4 curtailment as a mechanism of conjunctive administration
5 is not done.

6 Q. So what is the alternative? Is steady state
7 the alternative to curtailment -- I'm sorry -- is
8 curtailment based on steady state the alternative to
9 curtailment based on transient modeling?

10 A. Well, I think you can use the steady state
11 model to get there, but ultimately the solution is, you
12 know, what is done routinely in Colorado and some other
13 places, too, is you allow the juniors to keep pumping
14 and then you require them to mitigate for their impacts.

15 And, you know, to be -- and, like, in places
16 like Colorado when they come up with those replacement
17 plans that are either judicially or administratively
18 approved, those replacement plans need to be, you know,
19 tested and proven that they can operate in wet years and
20 dry years and all in order to be approved.

21 And if they don't -- if they can't function
22 that way or don't have a way to get them -- reliably get
23 the mitigation water they need, then they're not
24 approved and those water users don't get to pump. So
25 that's the safety net. You know, that prevents the

1 seniors from being injured and is way more efficient of
2 the resource.

3 Q. Is the impact from curtailment under a
4 transient model run disproportionate because of the
5 moratorium on new wells in the ESPA?

6 A. Well, I think the moratorium provides -- the
7 fact that there's been a moratorium in the ESPA since
8 the early '90s presents some additional facts that
9 make -- that are compelling to the use of the --
10 continued use of the steady state modeling to determine
11 the curtailment date. And that's because since that --
12 because of the moratorium, you know, there's been,
13 essentially, no new wells approved that -- since that
14 time that -- and if they have been, then they have to
15 mitigate for their impacts.

16 So, essentially, all of the wells that, you
17 know -- prior to the moratorium order have been
18 operating for at least 30 years and most of those wells
19 for much longer than 30 years. So you have a situation
20 where the current and prior pumping of virtually all of
21 the wells in the Snake River Basin has reached a near
22 steady state; and so, therefore, we can use steady
23 state modeling to evaluate the current -- the impact of
24 the current and prior pumping from the wells on the
25 Snake River. And that, to me, is a -- would be a better

1 way to establish or determine the curtailment date, is
2 going back to using the steady state modeling, because I
3 think that is the correct way to do it.

4 Q. Can I ask you to turn to page 24 in your
5 report, please.

6 A. Okay.

7 Q. And I believe this is a graph that Jennifer
8 Sukow produced but that you incorporated; is that right?

9 A. Yes. I just cut and pasted this from one of
10 her presentations that she gave to the -- during the
11 November 28th, 2022, meeting in the technical working
12 group.

13 Q. And this was actually something that was
14 discussed in Jennifer's testimony, too, wasn't it?

15 A. Yes.

16 Q. Let's see here.

17 A. Is there a question about this?

18 Q. Yes, there is.

19 A. Oh.

20 Q. I'm just trying to find it in my notes.

21 A. Oh.

22 MR. FLETCHER: No pressure.

23 MS. KLAHN: Yeah, right.

24 Q. (BY MS. KLAHN) So based on this graph, the
25 curtailment of pumping from wells junior to sometime in

1 the mid-1980s for steady state would produce
2 75,200 acre-feet of water in the --

3 A. Which graph are we looking at? Sorry, I might
4 be looking at the wrong one.

5 Q. I thought it was on the graph on page 24 of
6 your report. I'll withdraw that question.

7 A. I think that question you were asking me was
8 about --

9 Q. Page 26?

10 A. Yeah.

11 Q. All right. Let's go to page 26 of your
12 report. Explain what's shown here on the graph on
13 page 26 related to how you could produce -- how one
14 could produce 75,200 acre-feet of water in the river
15 from curtailment under the steady state approach.

16 A. Well, okay, so what this graph shows -- and
17 when I talk about this graph, I'll be talking mainly
18 about the yellow line and the orange line. So the
19 yellow line represents the results of the steady state
20 runs that Jennifer made. And so what this graph shows
21 is that along the bottom -- the axis is labeled "Water
22 Right Priority Date," and that's basically the
23 curtailment date that she simulates, and each one of
24 these dots is a separate run that she made.

25 And then the -- so -- and then on the y-axis,

1 that's the amount of water that's produced at the near
2 Blackfoot to Minidoka reach resulting from curtailment.

3 And so the orange line is -- for the transient
4 run -- represents the amount of water that's represented
5 in the first year, I think May 1 to September 30 from
6 curtailment in the first year. And so that's when --
7 kind of squint a little bit. If you go to around 1953,
8 and that -- the dot there is at about 75,000 acre-feet,
9 and so that's where you go and you can figure out how
10 much -- you curtail back to 1953, and in the first year,
11 you'll get 75,000 acre-feet at the key reach.

12 And then -- and when you look at the steady
13 state line, the yellow line, you can see that you only
14 need to curtail back to sometime in the mid-'80s to get
15 75,000 acre-feet. And that -- that will be -- that
16 would produce 75,000 acre-feet at steady state, so after
17 30, 40, 50 years it would take to get that much.

18 But that also represents -- that 75,000 --
19 another way you can look at that is that the current
20 and -- the current effect or the current depletion to
21 the near Blackfoot to Minidoka reach today caused by
22 wells junior to the mid-1980s is about 75,000 acre-feet.
23 That's their -- the impact of those wells' current and
24 prior pumping. And so had those wells not pumped, there
25 would be 75,000 acre-feet more in the river.

1 So I think that's sort of an easy way --
2 that's why I think the steady state modeling should be
3 used, because with that way of thinking, you can say
4 that, well, the -- that last 75,000 acre-feet of
5 depletion is what created the shortage, and the users
6 that are, you know, junior to the mid-'80s are the ones
7 responsible or the ones that caused that and they should
8 be the ones responsible for the mitigation. And, again,
9 that's why I think steady state modeling is the right
10 way, particularly in this situation, for determining the
11 curtailment date.

12 Q. Okay. Thank you.

13 Let me switch gears and let's cover some
14 responses you might have to testimony we've heard.

15 MS. KLAHN: Mr. Director, we're assuming that
16 you prefer we put on rebuttal testimony to the extent we
17 can in the case in chief, and so I just have a couple
18 questions to him to react to other witnesses.

19 HEARING OFFICER: That's great. I think it
20 will contribute to efficiency.

21 MS. KLAHN: Well, efficiency is what we're
22 after.

23 Q. (BY MS. KLAHN) One of the discussions we had
24 at some length yesterday, I believe it was, was the
25 nature and extent of Twin Falls Canal Company return

1 flows.

2 Do you recall that?

3 A. Yes.

4 Q. And I think we talked to both Department
5 witnesses about whether they were aware of the
6 Twin Falls Canal Company return flows and how much they
7 were, and there was not really anything conclusive, I
8 think, from that questioning. But the Department
9 maintains a database of return flows for Twin Falls
10 Canal Company?

11 A. Yeah, I mean, for all of the return flows to
12 the river that's -- you know, they've -- over the years,
13 they've -- they or other agencies have instrumented some
14 of these return places to the river, draws or places
15 where water collects and gets back in the river, because
16 that information has been used in the groundwater
17 modeling. It's good data. It helps you differentiate
18 how much of the reach gains are due to water coming on,
19 you know -- reaching the water -- river from the surface
20 versus water that's coming through the underground and
21 back to the river. And that's helpful information for
22 the modeling.

23 Q. For purposes of determining what's
24 attributable to reach gains from the aquifer versus
25 other sources?

1 A. Yeah, for calibration particularly, yeah.

2 Q. I want to hand you this and ask you to
3 identify it. Mr. Sullivan, would you identify this.

4 First of all, have you seen this before?

5 A. Yes, it was prepared under my direction.

6 Q. Okay. And what are -- what's the source of
7 the information on here?

8 A. It's listed in footnote 5 there. It's daily
9 data that's downloaded from IDWR's Aqua Info database.
10 There's the URL code there. And so we had heard
11 testimony from Jennifer Sukow --

12 Q. Well, wait. Let me just lay the foundation
13 here so we can offer it.

14 So the data on here was from IDWR's database.
15 This document was prepared at your direction.

16 MS. KLAHN: Mr. Director, I'd like to offer
17 this as a demonstrative exhibit showing the --
18 summarizing the data in IDWR's database related to
19 Twin Falls Canal Company return flows since we've had so
20 much testimony about that for purposes of clarifying the
21 record.

22 HEARING OFFICER: You want to mark the
23 document?

24 MS. KLAHN: Yes, please.

25 MR. FLETCHER 365?

1 MS. KLAHN: 365.

2 HEARING OFFICER: We'll mark the post exhibit.

3 COURT REPORTER: I'm sorry, what?

4 MS. KLAHN: Can we mark this as exhibit --

5 HEARING OFFICER: Mark it with an exhibit
6 sticker.

7 (Exhibit 365 marked.)

8 MS. KLAHN: So I'd like to offer Exhibit 365.

9 HEARING OFFICER: Any objections?

10 Hearing none, the document marked as
11 Exhibit 365 is received into evidence.

12 (Exhibit 365 received.)

13 Q. (BY MS. KLAHN) All right. Mr. Sullivan, you
14 started to describe what 365 shows.

15 Could you do that now, please.

16 A. Yeah, so these are the annual summaries of the
17 daily data that we downloaded from the IDWR database for
18 the places where return flows are measured, you know,
19 all along the Twin Falls service area from top to
20 bottom. So they're all measurement points that are at
21 or near the river at the bottom -- the lower end of
22 Twin Falls near the river.

23 And they're color-coded, just for
24 informational purposes, as the blue represents gauges
25 that are on the coulees, or the kind of gullies that

1 intersect or go through or depressions that bisect -- or
2 intersect a bunch of the canal service area for
3 Twin Falls.

4 And then there's also -- the orange represents
5 measurements that are actually on some of the
6 tributaries that come through the Twin Falls area.

7 And then the gray is some other lines that are
8 identified.

9 And then -- and for each of those in the
10 footnotes there, we've identified specifically which
11 gauges are in each of those different categories.

12 Q. So what's the difference between a coulee and
13 a tributary gauge?

14 A. The tributary is, like, a known -- mainly a --
15 what I identify as a tributary.

16 Q. Like a live stream?

17 A. Well, yeah. Or a creek or something that
18 actually comes through.

19 And so there are return flows that improve to
20 these creeks that go into the river. And then there's
21 other of these coulees that are really not, like, a main
22 tributary, but just a low spot in the Twin Falls area
23 where water collects and comes out.

24 Q. Okay. And then one more question.

25 This morning Mr. Barlogi testified that the

1 conversions to sprinklers in the Twin Falls Canal
2 Company had not changed demand, I believe. And he had
3 some testimony about how losses couldn't be reused, and
4 that's why the conversion to sprinklers didn't change
5 demand.

6 Do you have a professional reaction to that?

7 A. Yeah. I disagree with that characterization.
8 Because, in my experience, anytime you can improve the
9 on-farm efficiency, you can make due with less water.

10 Now, it is true that with less efficient use
11 you can have more runoff that can be reused in lower
12 parts of the system. And there is some of that that
13 does happen in Twin Falls.

14 But the issue is: I've never seen a system
15 where you can reuse everything. So inevitably some of
16 that -- you know, the return flow from the first use
17 gets away from you, you know, through the groundwater or
18 otherwise, and it can't be reused.

19 So in that process, yes, there's use and reuse
20 and maybe a third use, but you're losing water every
21 time that cycle happens.

22 And you're always going to be much better off
23 making more efficient use and basically -- than
24 delivering more first-use water and less reuse water.
25 That will always be more efficient.

1 And, yeah, there will be less overall delivery
2 to the users, but that's the way it should be. They
3 don't need as much water if they're more efficient.

4 And so, you know, from a consumptive use
5 basis, you can meet the same consumptive use with more
6 efficient on-farm operations and, therefore, less water
7 being diverted at the river heading.

8 Q. Okay. I think that's all the questions I have
9 for you right now.

10 HEARING OFFICER: Thank you, Ms. Klahn.

11 Cross-examination?

12 MR. FLETCHER: Yeah, I guess. I hadn't
13 thought of that.

14 Would it be better to see if there's any other
15 groundwater questions first before I cross-examine?

16 HEARING OFFICER: Well, I was assuming that
17 Ms. Klahn's -- this was Ms. Klahn's witness, and there
18 wouldn't be follow-up, but I'm willing to ask that
19 question.

20 Are there any of the groundwater user groups
21 that want to question Mr. Sullivan further?

22 I see heads shaking no.

23 Mr. Fletcher, are you examining?

24 MR. FLETCHER: Yes. Thank you.

25 ///

1 CROSS-EXAMINATION

2 QUESTIONS BY MR. FLETCHER:

3 Q. Good afternoon, Mr. Sullivan.

4 A. Good afternoon, Mr. Fletcher.

5 Q. Nice seeing you again.

6 A. Likewise.

7 Q. We have participated in several of these
8 hearings over the years.9 You mentioned in your direct examination that
10 you've been involved in this water call since 2005, I
11 guess; right?

12 A. Yes.

13 Q. And in 2007's hearing before the hearing
14 officer, you rendered several opinions in your expert
15 report; isn't that correct?

16 A. I did.

17 Q. And one of those opinions was that there was
18 no injury occurring to the senior users; isn't that
19 correct?20 A. Not quite. I think I'd identified some
21 limited instances where there was some shortages.22 Q. You gave written direct testimony in that
23 proceeding; is that correct?

24 A. Yeah, I think we did that.

25 Q. What's that?

1 A. Yes.

2 Q. And I believe the very last question you were
3 asked -- I'll read it to you and see if you remember
4 this -- was: "Did the Surface Water Coalition suffer
5 injury during the 2005 and 2006 irrigation seasons?"

6 And your answer was: "No. The water budget
7 analyses that are summarized in Exhibit 3023, together
8 with the deposition testimony of the SWC managers, shows
9 that the SWC members were not short of water in 2003 and
10 did not suffer injury" -- or excuse me -- "2005 and did
11 not suffer injury in 2005."

12 Do you recall that opinion?

13 A. Not specifically, but I'll take your word for
14 it.

15 What I was referring to, I think, was I did an
16 analysis over that longer period, and there were a
17 handful of small shortages during that time.

18 Q. So your opinion in that case, ultimately, was
19 not accepted by the hearing officer; is that correct?
20 Your opinion concerning injury.

21 A. I don't recall.

22 Q. Well, did the hearing officer find that there
23 was no injury?

24 A. No. No, he didn't. He didn't find any --

25 Q. He found there was injury; correct?

1 A. Right. Well, he found -- I don't remember the
2 details, but he found that they needed to institute a
3 methodology to address impacts and shortages.

4 Q. And you also rendered an opinion that the
5 Department should use some sort of achievable farm
6 efficiency formula; isn't that correct?

7 A. Yes.

8 Q. And that was rejected as well; correct?

9 A. At that time, yes.

10 Q. And you rendered an opinion that there should
11 be no minimum carryover requirement in the Methodology
12 Order; isn't that correct?

13 A. I think for purposes of -- well, in fact, yes.
14 Yep.

15 Q. And that was rejected as well; correct?

16 A. Yes.

17 Q. And you also -- in your opinion, Twin Falls
18 Canal Company's diversion rate should have been
19 five-eighths of an inch per share; correct?

20 A. I think that's what it was at the time.
21 Right?

22 Q. Well, the hearing officer accepted that.
23 Do you recall this?

24 A. Yes.

25 Q. So if you don't remember this, I'm not trying

1 to stump you here.

2 A. I know.

3 Q. But that was overruled by Judge Melanson in
4 July 24, 2009; correct?

5 A. I'll take your word for it.

6 MR. FLETCHER: I'll just direct the Director
7 toward the July 24th, 2009, order on petition for
8 judicial review issued by Judge Melanson, page 31.

9 Q. (BY MR. FLETCHER) You also advocated for an
10 industry standard when it came to determining whether
11 the projects were being efficient; correct?

12 A. Yes.

13 Q. And that was rejected as well; correct?

14 A. Is that the same question you just asked me
15 before?

16 I was advocating for using industry standard
17 efficiencies and the -- as I recall, the hearing officer
18 decided he didn't have the ability to differentiate that
19 information.

20 Q. So you agree that that was rejected by the
21 hearing officer?

22 A. Ultimately, it was, yes.

23 Q. So in all of these call proceedings, you have
24 been representing groundwater pumpers, correct, the
25 cities?

1 A. Yes.

2 Q. And you feel that it's your position to
3 minimize the amount of mitigation that's required by a
4 groundwater pumper?

5 A. No. My -- I feel like I have a role here to
6 help assist the Department in determining that if
7 mitigation is required, that it's required in amounts
8 that are really needed to alleviate real shortages.

9 Q. Well, let's talk about that for a minute.

10 One of the things you talked to your counsel
11 about was the change by the Fifth Methodology Order
12 As-Applied Order using transient analysis to determine a
13 curtailment date versus steady state; correct?

14 A. Yes, we talked about that.

15 Q. Right. And you agree, I mean, in principle,
16 that all groundwater rights on the Eastern Snake River
17 Plain are junior -- or substantially all of the
18 groundwater rights on the plain are junior to all of the
19 surface water users; is that correct? Junior and prior?

20 A. Well, with that -- with that "substantially"
21 qualifier.

22 Q. Okay. So your opinion is that steady state
23 modeling should be used to determine the priority date
24 of curtailment?

25 A. Yeah.

1 Q. Does steady state modeling for a curtailment
2 date mitigate in-season demand shortfall?

3 A. Yes, if -- I mean, the modeling itself
4 doesn't, but the modeling identifies the user -- the
5 groundwater users that are responsible for causing the
6 shortage, and it's those users that should mitigate the
7 shortage.

8 Q. Well, let me ask my question a different way:
9 If steady state is used in the modeling to determine a
10 curtailment date, will the amount of shortfall
11 determined by the order be fulfilled in that year?

12 A. If you are using curtailment for the mechanism
13 for conjunctive administration, it would not.

14 But that is not the way you conjunctively
15 administer groundwater. The use of the model to
16 determine the curtailment date should be determining --
17 the purpose of that should be determining the pool of
18 users that are responsible for mitigating the impact.
19 And the mitigation is what should be alleviating the
20 shortage, not curtailment. Because, for the reasons I
21 just talked about, curtailment is a very inefficient way
22 of administering groundwater, and that's why it's not
23 done in the West.

24 Q. That's a long answer to a "yes" or "no"
25 question.

1 But the real point here is that steady state
2 use will not provide water in-season to the injured
3 party, the amount of water, the amount of injury?

4 A. Not if -- it would not if you only curtail
5 back, like, to the mid-'80s. In the example I was
6 giving, in the first year it won't.

7 Q. Do you agree with Jennifer Sukow's information
8 that was on the chart that you referenced in your
9 report, that only about 15 percent of the shortfall
10 would be realized in the first year of mitigation?

11 A. I think the percentage is actually smaller
12 than that. Because I think that 15 percent refers to
13 the percent of water that ultimately will show up in
14 that reach.

15 But if you look at that -- at the percentage
16 as the percentage of the water curtailed, it's actually
17 a much smaller percent.

18 Q. Well, I'm talking about the amount of injury
19 that's determined.

20 According to her chart, 15 percent of the
21 injury will show up in the first year of curtailment
22 using steady state; correct?

23 A. Well, that's another way of asking the
24 question you asked me before. Yeah, it won't -- the
25 full 75,000 acre-feet would not show up in the first

1 year.

2 Q. About 15 percent will show up in the first
3 year; correct?

4 A. If you only curtail back to 1980 -- the
5 mid-'80s.

6 Q. Okay. So, in your opinion, an injured senior
7 is only entitled to receive about 15 percent of the
8 shortfall resulting from injury in one year in time,
9 location, and amount.

10 MS. KLAHN: Objection; mischaracterizes
11 testimony.

12 HEARING OFFICER: This is cross-examination.
13 Overruled.

14 THE WITNESS: I think you mischaracterized my
15 testimony.

16 Q. (BY MR. FLETCHER) What a surprise. Whose
17 testimony, I'm not sure whose testimony?

18 A. Well, if I may explain.

19 Q. Sure.

20 A. In my mind, the proper way of conjunctive
21 administration is to determine who has to mitigate, and
22 we shouldn't be using curtailment as the way to
23 mitigate, as the way to deliver the water to the
24 seniors. We deliver them storage water, you know, the
25 other kinds of mitigation that have been determined

1 previously. That is more targeted and more efficient,
2 and it allows for a better use of the resource, it keeps
3 the senior whole. And the curtailment analysis is just
4 to determine who has to -- who has to provide the
5 mitigation water, but the Surface Water Coalition gets
6 their water.

7 Q. Yeah, I'm not disagreeing with you, and I
8 don't think anyone is that if someone has a mitigation
9 plan in place and it's effectively operating, then we're
10 not talking about those people in this hearing; correct?

11 In fact, your client, the City of Pocatello
12 and the other cities, have an effectively operating
13 mitigation plan; correct?

14 A. They do.

15 Q. Right now?

16 A. Yes, they do.

17 Q. They've never breached that plan, have they?

18 A. No.

19 Q. They're not facing curtailment as a result of
20 this hearing?

21 A. Well, they could ultimately if the
22 curtailment -- or the shortage requirements become so
23 much that it strains their mitigation supply. And so
24 that's why it's in everyone's interest to make sure that
25 the mitigation amounts that are necessary are truly

1 necessary to meet real shortages.

2 Q. Well, their obligation in their plan is capped
3 at 9,000-some acre-feet; correct?

4 A. Yeah, but the plan doesn't last forever.

5 Q. So 30 years from now, or whenever that plan
6 runs out, that's your concern for your clients?

7 A. That's one concern. I think our clients are
8 interested in the viability of agriculture in the whole
9 area, and so, you know, part of that viability is
10 enhanced by maximizing the use of the resource.

11 Q. So I'm going to get back to the question you
12 were working around earlier.

13 In your opinion, a senior should only receive
14 15 percent of the injury at the time of injury by using
15 steady state; correct?

16 A. I absolutely disagree with that
17 characterization.

18 Q. But that would be the result if steady state
19 was used for curtailment?

20 A. If that was used and you didn't require those
21 users to mitigate, you just were relying on curtailment
22 alone, you would be right. But that's not what would
23 happen. And if those users can't mitigate, then they
24 should be curtailed and not allowed to operate at all.

25 And that whole -- I mean, in my experience in

1 Colorado, that whole -- that creates an incentive for
2 these users to develop these plans and mitigate, and
3 that's what I've seen happening in Idaho for the most
4 part. I mean, most users are on a plan; right?

5 Q. Isn't every user in this room in a mitigation
6 plan?

7 A. Well --

8 Q. Every groundwater user in this room is a party
9 to a mitigation plan; is that correct?

10 A. Yes, but those plans aren't necessarily
11 forever, and some I understand are being renegotiated;
12 and so, I mean, there's changes afoot.

13 Q. So as I understand your testimony, if they
14 breach those plans, then they should be curtailed?

15 A. Yeah. Well, and even those plans -- yes, if
16 they breach the plans, they should be curtailed, and
17 those plans should be -- you know, should be reliable
18 plans so that the risk of breaching is very low and
19 doesn't fall on the shoulders of the seniors.

20 Q. A steady state use of the model does not
21 predict an instantaneous response to the reach in
22 question; correct?

23 A. Well, no run does.

24 Q. Now, as I understand your testimony about the
25 1980s wells, first of all, none of those wells from the

1 1980s have been curtailed; correct?

2 A. Today.

3 Q. Today.

4 A. I don't know. I thought the -- I mean, I was
5 out of the country for a while, but I thought that the
6 Director had -- there was an order that he was going to
7 curtail as of sometime in May. And maybe I just -- I
8 don't know what happened since then.

9 Q. I missed that order the Director issued
10 curtailing people to the mid-1980s.

11 The bottom line is that no one that's had a
12 mitigation plan in place, none of the parties to this
13 proceeding, have been curtailed; correct?

14 A. I think that's right.

15 Q. So for you to talk about if pumping had never
16 occurred since 1980s, then 75,000 acre-feet would be in
17 the reach this year and there would be no injury, that's
18 just fantasy, isn't it?

19 A. No. That's just a different way of saying
20 that the last 75,000 acre-feet of depletion that created
21 the shortage was caused by the wells junior to the
22 mid-'80s, and, therefore, they should be the ones
23 responsible for mitigating it because they caused the
24 problem.

25 Q. So your position, then, is only those wells

1 since the 1980s should be required to furnish all of the
2 injury determination this year?

3 A. For this year. And next year if the shortages
4 is more than -- maybe the curtailment date goes to, say,
5 1970, then that pool of users should have to replace in
6 that year.

7 Q. And if they can't furnish the water or won't
8 enter into a mitigation plan, then what?

9 A. I think -- well, the way that -- I don't want
10 to get too far out in front of my client or anything,
11 but in Colorado, you have -- you can't pump unless you
12 have a mitigation plan. So I don't know if that's --
13 that's a solution, maybe there's other ways, too, but
14 that's the way it works in Colorado.

15 Q. Yeah, I'm not disagreeing with that idea of
16 yours. Trust me. I like it. But it's not what Idaho
17 uses; isn't that correct?

18 A. That's correct. But my understanding also is
19 that there's -- the amount of users that are operating
20 without a plan is relatively small.

21 Q. So the -- under your 1980s theory, the 19 --
22 for that water to appear in this reach, the
23 75,000 acre-feet injury, the 1980s water rights and
24 junior to that would have to be permanently curtailed;
25 correct?

1 A. No. They would have to provide mitigation.

2 Q. Or provide mitigation?

3 A. Well, yeah, provide mitigation is --

4 Q. And if they don't provide mitigation, they
5 would have to be permanently curtailed for that amount
6 to appear in the reach?

7 A. The threat of curtailment is the stick to keep
8 them mitigating.

9 Q. You know, you just won't answer the question.

10 The question is: If they don't mitigate, if
11 they don't mitigate, your theory is they would be
12 permanently curtailed so that that 75,000 acre-feet
13 would show up in the reach; correct?

14 A. The point of curtailment is that they're not
15 mitigated, and I'm not really looking at later stuff as
16 when the water shows up or anything like that.

17 Q. Let's talk about your Colorado plan that you
18 suggest to the Director in your report on pages 24 and
19 25.

20 You've explained this two or three times that,
21 under Colorado, the water user -- groundwater user is
22 required to have a plan in place before the season ever
23 starts; correct?

24 A. Yes.

25 Q. And it has to be approved?

1 A. Well, and I should say, not everywhere, but in
2 most places in Colorado, they have to.

3 Q. And what are those plans called in Colorado?
4 They're not mitigation plans, they're augmentations?

5 A. There's augmentation plans that are approved
6 by the court, and then they have substitute supply plans
7 that can be approved by the agency in some limited
8 instances.

9 Q. And our conjunctive management rules don't
10 talk about augmentation plans or substantive water
11 plans; correct?

12 A. Yeah, but I've always viewed a mitigation plan
13 as functionally the equivalent.

14 Q. So as I understand -- the way they do it in
15 Colorado, those plans have to be in place before the
16 irrigation season. Not only the plan has to be in
17 place, but the supply of mitigation water has to be in
18 place before the irrigation season; correct?

19 A. Yeah, or, you know, reasonably certain that it
20 can be there.

21 Q. And that depletion caused by that groundwater
22 user has to be delivered in time, location, and place
23 under that replacement plan or whatever it's called?

24 A. Sufficient in time, location, and amount to --
25 and such that it prevents injury. So it doesn't have to

1 exactly match the depletions, but it needs to get to the
2 user before they're injured.

3 Q. And those plans do not cover 100 percent of
4 the depletion?

5 A. Right. Because at times when there's -- the
6 seniors have enough water, then there's not a mitigation
7 plan.

8 Q. So it -- how is it determined each year how
9 much should be covered under the replacement plan?

10 A. Well, there's routine accounting that's
11 performed by these plans that is submitted, and it
12 depends on, you know, how much water is available, how
13 much the seniors are diverting, what the shutoff date is
14 of the water rights and who's short and that sort of
15 thing, and what depletions the juniors are creating.
16 And it's become routine.

17 Q. Okay. When you say it's routine, who's doing
18 that accounting?

19 A. Well, the accounting is done largely by the
20 users and, you know, standard mechanisms have developed
21 for reporting that information, and so the users do most
22 of the work. It's submitted to the agency in a certain
23 format so that it's relatively easy for the agency to
24 review it, and it's also transparent because the users
25 can review each other's accounting and make sure it's

1 all kosher. And it ends up working -- it's working very
2 well, actually.

3 Q. So in addition to that requirement of having
4 the water in place before the season starts, under the
5 Colorado model that you're talking about, or method,
6 those groundwater users are required to have telemetry
7 on their meters or some sort of way to measure their
8 diversions?

9 A. Well, similar to Idaho, there's -- in most
10 areas, there's -- well, the groundwater users have to
11 measure their use for -- sometimes they're allowed to
12 calculate it, you know, with our data, but, yeah,
13 there's typically measurement requirements.

14 Q. How often is it measured in Colorado?

15 A. Well, I mean, they're typically like a
16 continuous meter, totalizing flowmeter, so it's
17 measuring continuously. And then the reporting for
18 these plans, it's typically monthly or annual.

19 Q. Yeah. Aren't there plans that require daily
20 reporting?

21 A. For -- maybe a few, but not -- I mean, they
22 may submit daily data, but ultimately, that's part of
23 the -- you know, as input to the accounting. But
24 ultimately, it's rolled up into sort of a balancing
25 period that may be monthly or annual that they have to

1 balance --

2 Q. So monthly is more common than daily; is that
3 what you're saying?

4 A. Well, it kind of -- it depends on the
5 situation, you know, that -- yeah, it's kind of
6 situation specific.

7 Q. To your knowledge, are the groundwater users
8 in Idaho required to report, monthly, their diversions?

9 A. I don't think so, but I don't know.

10 Q. And aren't those meters calibrated every two
11 years by a certified inspector?

12 A. In Colorado.

13 Q. In Colorado?

14 A. I think that that varies by basin.

15 Q. But, overall, those components of the Colorado
16 plan, that's what you're recommending the Director
17 adopt, that you've just talked about?

18 A. I mean, maybe some components. I haven't
19 really thought that far ahead, but I think the -- there
20 could be a mechanism developed that protects the senior
21 and has, you know, accounting based on measured use and
22 those sorts of things that could work here.

23 Q. Are all groundwater users in compliance with
24 their replacement plans?

25 A. Where?

1 Q. In Colorado.

2 A. For the most part, yeah, or they get
3 curtailed.

4 Q. So when you say they're curtailed, how are
5 they curtailed?

6 A. That the sheriff comes out and tags their well
7 and enjoins them from pumping.

8 Q. Okay. Does that have -- before that
9 curtailment takes place, do you have to go through some
10 kind of administrative proceeding?

11 A. Yes.

12 Q. I'd like to talk to you about your acreage
13 just for a minute.

14 I'd like you to open page 19 of your report.

15 Exhibit 347A, I think; is that right?

16 And as I understand your recommendation to the
17 Director, you're recommending that he use those acreage
18 numbers that are in the column labeled, "2021 Acres"; is
19 that correct?

20 A. Sorry. What page are you on?

21 Q. Page 19.

22 Let me double-check. Excuse me. Page 18.

23 A. Yeah. I mean, that was the most recent one
24 or -- but, you know, the numbers are similar.

25 So I think that this would be a good place to

1 start for coming up with the acres.

2 Q. Yeah, it says in the report: "In my opinion,
3 it would be more appropriate to use the 2021 acres for
4 purposes of the demand calculations."

5 Correct?

6 A. Yeah.

7 Q. Have you totaled those acres in 2021 -- 2021?

8 A. And when I said that, I should have been
9 clear. I meant for Burley and Minidoka and for
10 Twin Falls.

11 Q. Well, that's not what your report says.

12 A. I should have been more clear.

13 Q. So that's a mistake. You only want to use --

14 A. Well, they shouldn't be able to -- you know,
15 if they're irrigating more than their shapefile or more
16 than they say they're irrigating, then that should be a
17 consideration as well.

18 Q. Well, I don't disagree with you, I'm just
19 reading what your report says.

20 A. Okay. I was --

21 Q. Because those 2021 acres total over
22 618,000 acres; correct?

23 A. Well, there's -- if you look at, like,
24 North Side -- I used to know the answer to this -- but
25 there's some -- there's a reason why North Side says 220

1 in 2021 and not 154.

2 Q. Okay. My question is: The 2021 column adds
3 up to over 618,000 acres; correct?

4 A. I haven't done the math.

5 Q. Well, the math can be done, but I would advise
6 you that if you do the math, you're showing an increase
7 in acreage of about 57,000 acres by using 2021?

8 A. I think using the actual acreage would reduce
9 the overall acres.

10 Q. What goes into determining crop water need?

11 A. Irrigated area, the crops that are being
12 grown, and the weather.

13 Q. And is the crop mix an important factor of
14 that crop water need?

15 A. Yes.

16 Q. And, in your opinion, the more current that
17 information is, the better?

18 A. Yes. I mean -- yeah, I mean, assuming we're
19 trying to figure out what the crop water need is today,
20 we should be using current data.

21 Q. Yeah. If you had 2023 data available, it
22 should be used; correct?

23 A. Yes.

24 Q. And how is the Department doing that now; do
25 you know?

1 A. Yeah. I think they're -- they're using what
2 they call CDL information. So it's remote sense crop
3 data. And that data is not available in real time,
4 so -- or at least not readily available in a form it can
5 be used. So I think they use data from the previous
6 year.

7 Q. Are they averaging previous years.

8 A. Oh, you're right.

9 Q. Yeah, I'm not trying to stop you --

10 A. No, you're right.

11 Q. A lot of details in this stuff.

12 A. Yeah.

13 Q. They're averaging about three years to
14 determine what this year's crop data mix is; is that
15 correct? Or is it more than that?

16 A. It's -- yeah, three to five. I don't remember
17 exactly.

18 Q. I'd like to talk to you about project
19 efficiencies. A little bit of reality instead of
20 theory.

21 You toured these projects back in 2005 or '06.
22 I don't know what year, but...

23 So you're familiar with how they're actually
24 laid out on the ground; correct?

25 A. Yes.

1 Q. And, Twin Falls, who -- everybody's after
2 Twin Falls in this proceeding. Twin Falls has, what,
3 100 miles of canals and about 1,000 miles of lateral
4 ditches and other parts of its delivery system?

5 Sound right?

6 A. I don't know those exact statistics, but it's
7 a large irrigation system.

8 Q. And when they design a system like Twin Falls,
9 aren't they designing that system to carry peak demand,
10 the amount -- the largest amount of water they need
11 during the year to grow a crop?

12 A. They should be.

13 Q. And isn't that typically occurring in the
14 months of June, July, and August when it's the hottest
15 and all of the crops are growing, generally?

16 A. Typically.

17 Q. So your review, and I think the Department's
18 review as well, shows when the demand is the highest and
19 when the canals are near capacity, they're the most
20 efficient. Wouldn't you agree with that? The project
21 is most efficient?

22 A. I think that's what the -- the results, those
23 monthly -- actual efficiencies that I calculate that are
24 crop water need divided by diversion are at their
25 highest in the mid-season.

1 Q. Right. And that's when the project efficiency
2 is also the highest; correct?

3 A. And the reason that is, is because I think
4 they're probably overdiverting in the other months when
5 the demand is lower.

6 Q. That's what I want to talk to you about.

7 In the spring and fall, they still have to
8 make deliveries to water users; correct?

9 A. Depending on how the company operates. But,
10 yeah, I mean, they -- there's different mechanisms for
11 ordering water, and they have to try to meet those
12 deliveries.

13 Q. And using Twin Falls as an example, they may
14 have to be delivering water still down 100 miles of
15 canals and a 1,000 acres of lateral ditches?

16 A. Yeah.

17 Q. Even in the spring and fall; correct?

18 A. Correct.

19 Q. Now, that doesn't mean that every farm on that
20 project is irrigating at that time; correct?

21 A. In the fall?

22 Q. In the fall or even in the early spring.

23 A. Well, the demand is generally less in the fall
24 and the early spring.

25 Q. Some crops have been harvested by the fall;

1 correct?

2 A. Correct.

3 Q. But they still have to convey water to all
4 their other water users on the system; correct?

5 A. But, overall, the demand is lower.

6 Q. I'm not talking about the demand; I'm talking
7 about the fact they have to still convey water through
8 their system to all other users.

9 A. Yeah, but the amount that's peeled off on the
10 way is less because the demand is less.

11 Q. Okay. The headgate deliveries are less, is
12 what you're talking about; correct?

13 A. Uh-huh.

14 Q. But you still have to push all that water
15 through a system that was designed to carry the peak
16 load of June, July, and August; correct?

17 A. Of course.

18 Q. And doesn't that effect those efficiencies in
19 spring and fall?

20 A. You, typically, can see some lower
21 efficiencies in the spring and fall, but I think to the
22 extent to which these efficiencies have gotten so low
23 are unreasonable.

24 Q. What I just described to you is true for
25 almost all open-canal surface water systems; correct?

1 Their peak efficiencies -- project efficiencies tend to
2 be in the midsummer, and their spring and fall
3 efficiencies typically are lower?

4 A. Typically. But then the issue is: How much
5 lower, okay, in the shoulder months?

6 Q. Well, Twin Falls -- do you know how many
7 acre-feet per acre it delivers or that -- excuse me --
8 how many acre-feet per acre does Twin Falls divert at
9 the Snake River to deliver to it's 180- or 90,000 acres,
10 whatever we're talking about?

11 A. What, 1.1 million divided by --

12 Q. I'll just throw a number out there, and you
13 can tell me if you disagree.

14 Around 5.8 acre-feet, something in that
15 neighborhood?

16 A. We can use that for an example.

17 Q. And you believe that's an unreasonable amount
18 of acre-feet to deliver -- whether it's 180- or
19 190,000 acre-feet -- over a system that's -- conveys
20 water through, roughly, 1100 miles?

21 A. Well, I don't think you look at it that
22 simply. And that's -- you would look at it in more
23 detail.

24 Like, I've done that in the past, and I think
25 that more detailed look shows that they're typically

1 diverting more than they need to.

2 Q. Well, it's my understanding --

3 A. And more than they -- and more than they would
4 need to in comparison to -- in my experience, compared
5 to other large irrigation systems that operate more
6 efficiently.

7 Q. So what other irrigation system do you know
8 that delivers water to close to 200,000 acres through
9 lava soils and stretches -- well, you heard Mr. Barlogi
10 talk about 10,000 acres covering, roughly, 15-square
11 miles.

12 I mean, what other system are you talking
13 about?

14 A. Well, there's -- I mean, I just got through
15 with a long litigation in Texas v. New Mexico where, you
16 know, analyzing the irrigation operations under the
17 Rio Grande project. And those are huge systems, very
18 long, hundreds of miles long, and they operate more
19 efficiently than Twin Falls does.

20 Q. Have you looked at other irrigation systems in
21 the Eastern Snake River Plain?

22 A. Well, all the Surface Water Coalition members.

23 Q. Have you looked at others up the river?

24 A. Not in this level of detail.

25 Q. Do you have any idea how many acre-feet per

1 acre those systems divert?

2 A. Well, they're not calling curtailing juniors,
3 though.

4 Q. I understand. But you're talking about an
5 industry standard or a reasonable diversion rate.

6 A. I'm talking about industry standard in the
7 situation where there's conjunctive administration and
8 curtailment going on.

9 Q. What is this industry standard that you're
10 talking about? You don't put it in your report. What
11 is the industry standard for Twin Falls Canal Company?

12 A. I don't understand the question.

13 Q. In your report, you say Twin Falls should be
14 measuring against an industry standard; correct?

15 A. Well, I think when I use that terminology, I
16 mean the reasonableness of their operation, vis-à-vis
17 their irrigation efficiencies and all should be analyzed
18 in an industry standard way where the efficiencies that
19 they should be expected to operate at before juniors are
20 curtailed, for their benefit, should be based on, you
21 know, their reasonable conveyance efficiencies. And,
22 you know, their conveyance efficiencies and conveyance
23 losses are knowable. And the amount of waste that is
24 running out, you know, just gets spilled through the
25 waste gates or runs out into the canal is knowable.

1 And there are industry standards that large
2 canal systems operate under with -- yeah, I agree with,
3 you know, what Jay was saying, that there is a certain
4 amount of waste that has to happen to operate these
5 large systems; but there's also a limit or a point at
6 which it becomes unreasonable. And it's certainly --
7 it's easier to operate a canal system with more waste.
8 You don't have to manage it as carefully.

9 But I think in a situation of conjunctive
10 administration, there should be a reasonableness test
11 before you curtail others.

12 So that's the conveyance efficiency piece.
13 And then there's the on-farm efficiency piece, and
14 industry standards on that is that there's certain
15 efficiencies for gravity irrigation, sprinkler
16 irrigation, that the users should be operating up to
17 before juniors are curtailed.

18 And as I testified earlier, I'm not saying
19 they have to, it's just that if you're requiring
20 mitigation and curtailment, there should be an
21 obligation in the calculation that you don't calculate a
22 shortage until they are operating at that level.

23 Q. And in the 2007 hearing, the hearing officer
24 and the Court found that the Surface Water Coalition --
25 their operations were reasonable; isn't that correct?

1 A. I think the -- they did. I think the hearing
2 officer chose not to engage in all the details of the
3 analysis.

4 Q. Okay. So your -- the stuff you're talking
5 about right now was rejected by the hearing officer?

6 A. Yes.

7 Q. On page 12 of your report, you make a
8 statement where you say: "Declines in the average
9 project efficiencies are due to these systems not being
10 managed as well as they were in the past."

11 What facts do you have to back that up? Have
12 you -- do you have any evidence that the projects are
13 not being managed properly?

14 A. Well, that's -- so that's based simply on
15 that -- I forget the figure, but the figure where I had
16 tabulated the average efficiencies that I found --
17 actual efficiencies -- you know, crop water need divided
18 by what they're actually diverting -- from my analysis
19 using the data from, what is it, 1990 to 2006. And so
20 that's -- that was a set of actual efficiencies for each
21 of the members.

22 And when I -- and when those actual
23 efficiencies are now computed again with the more recent
24 data, they're actually lower. And so, you know, what
25 has changed that they should be lower and one -- you

1 know, apparently, they're not being managed as well
2 because they're having to divert more water to meet
3 their demands than they did in the past. So that was
4 the basis for that statement.

5 Q. And you heard Mr. Barlogi's explanation for
6 that; correct?

7 A. That they're converting to --

8 Q. Well, first of all, they aren't diverting that
9 much more water, are they, at Twin Falls Canal Company?

10 A. When you do the math, the efficiencies are
11 lower.

12 Q. They've been -- you saw his chart where it
13 showed he was diverting about 1.1 million acre-feet for
14 I don't know 20, 30 years?

15 A. Well, but it goes up and -- you know, about --
16 but it goes up and down --

17 Q. Right.

18 A. -- and it's been more of late. I mean, that's
19 why the baseline year has been going up.

20 Q. So that's an analytical analysis you did to
21 come up with that determination they're not being
22 managed as well. It's not based upon any facts;
23 correct?

24 A. Facts?

25 Q. Dealing with observations of management?

1 A. I haven't done that.

2 Q. Do you believe that the Methodology Order
3 should be used to protect seniors from injuries caused
4 by junior diversions?

5 A. Yes.

6 Q. Do you agree that if injury is determined, the
7 shortfall should be supplied in time, location, and
8 amount that season?

9 A. Well, I still believe that they really
10 shouldn't really have to pay it back. You know, make --
11 pay back the depletion until, you know -- it could be
12 sometime later if the users still have storage
13 available. But under the methodology, there's some
14 constraints on that. So I mean, if we're working within
15 that constraints of the methodology, then, yeah, they
16 should provide the water in the season or at the time of
17 need.

18 Q. Thank you.

19 HEARING OFFICER: Mr. Thompson, I assume that
20 Mr. Fletcher's cross-examination was sufficient, or do
21 you want to ask some questions as well?

22 MR. THOMPSON: I have a few, Director, if
23 that's okay.

24 ///

25 ///

1 CROSS-EXAMINATION

2 QUESTIONS BY MR. THOMPSON:

3 Q. Good afternoon, Mr. Sullivan. Travis Thompson
4 for A&B Irrigation District, et al.

5 A. Good afternoon, Travis.

6 Q. Just a couple of questions. Kent covered
7 quite a bit, so I won't go back over that.8 On page 6 to 7 of your report, you talk
9 about -- I think you do a lot of comparison of an
10 average year of diversions looking at 2000 to 2021; is
11 that correct?

12 A. Yeah, that's what the Department did.

13 Q. And you just kind of compared that to the
14 prior baseline year of '6/'8/'12?15 A. Yeah, I was just basically stating what the
16 Department did for that particular piece of that.17 Q. So if we're looking at an average diversion,
18 would you agree that that average diversion does not
19 meet the methodologies criteria of an above average year
20 of diversion?

21 A. The '06/'08/'12?

22 Q. I'm just -- whatever average we're talking
23 about. We're just looking at a straight average.24 A. Yeah, as I testified earlier, I mean, if you
25 still just use 2000 to 2021, it's 40 acre-feet short of

1 being above average.

2 Q. And the criteria in the order requires that
3 you're above average diverting; would you agree?

4 A. It does.

5 Q. And are you familiar with the order on
6 judicial review of the Methodology Order issued by
7 Judge Wildman back in 2014?

8 A. I'm sure I read it.

9 Q. I guess would you agree that an average year
10 of diversion does not meet the standard that he
11 approved?

12 MS. KLAHN: Objection; the document speaks for
13 itself.

14 THE WITNESS: I don't recall exactly --

15 HEARING OFFICER: Just a moment.

16 I'll allowing questioning in this area. I
17 think it's important. If there's an objection, it's
18 overruled.

19 Q. (BY MR. THOMPSON) I'm just curious.
20 Arguments made in that case by Pocatello and IGWA were
21 requesting that an average year be used.

22 Were you aware that those were rejected by the
23 Court?

24 A. I'll take your word for it.

25 Q. I guess would you agree that the average of

1 the combined diversions for all Coalition members is not
2 reflective of a standard of an above-average year for an
3 individual Coalition member?

4 A. Yeah, I mean, that's different. It seemed
5 like the methodology doesn't require it to be done user
6 by user.

7 Q. And it's not average whether it's the
8 Coalition or if it's a single user; is that correct?

9 A. I'm sorry, can you say that question again,
10 please.

11 Q. The methodology does not require an average
12 year; isn't that correct?

13 A. Above average.

14 Q. Yes.

15 A. Uh-huh.

16 Q. So you talked about increased diversions the
17 last few years. Would you turn to Exhibit 300. I think
18 that's the Fifth Methodology Order.

19 Could you turn to page 7, Mr. Sullivan.

20 A. Okay.

21 Q. And what is that table depicting?

22 A. The graph here?

23 Q. Yes.

24 A. It says: "April Through September Growing
25 Degree Days."

1 Q. So would you agree that warmer climatic
2 conditions could contribute to increased diversions in
3 recent years?

4 A. They could.

5 Q. And based on that graph, have we seen a
6 greater number of years with growing degrees higher than
7 that average than the years prior? I'm going to look
8 at, like, 2012 through '21.

9 A. Yeah, there's more years above average.

10 Q. How about more water consumptive use crops?
11 Could that contribute to greater demand?

12 A. It could.

13 Q. So you talked about 2022 in your report.
14 Would you agree that was a year of limited water supply
15 for certain Coalition members?

16 A. I don't recall.

17 Q. Are you aware of reduced deliveries by certain
18 Coalition members in 2022?

19 A. Reduced delivery?

20 Q. Yes.

21 A. I haven't studied that 2022 diversion data in
22 detail.

23 Q. Or shortened irrigation seasons?

24 A. I don't know.

25 Q. So if that were the case, if those certain

1 members had reduced supplies in 2022, reduced
2 deliveries, shortened irrigation seasons, would you
3 agree that that year would not meet the Methodology
4 Order's criteria for a baseline year?

5 A. I don't think I was suggesting that 2022 be a
6 baseline year, but if I -- it could be used in computing
7 the average over the period.

8 Q. Right. Which is not used by the methodology?

9 A. Well, the methodology does require, as I
10 understand it, a computation of some average with which
11 the baseline year is then compared to, to see if the
12 baseline year is above average.

13 Q. Yeah, I think the criteria we talked about, it
14 needed to reflect a year of above average to protect the
15 senior at the outset?

16 A. Right.

17 Q. So would 2022 be above or below average?

18 A. I think it's probably below average, but
19 maybe -- I don't know if I misunderstand or there's some
20 misunderstanding, but I didn't propose that 2022 be a
21 baseline year.

22 Q. No, that wasn't my question.

23 A. Oh, okay.

24 Q. Turn to page 7. I just have a statement I
25 wanted to ask you about -- back in your report, I'm

1 sorry, Mr. Sullivan.

2 So you make this statement about Twin Falls
3 Canal Company's, I'll quote, legally established
4 delivery rate.

5 Do you see that?

6 A. Yeah, on the second-to-last paragraph.

7 Q. I think you testified earlier today that
8 you're not an attorney; is that correct?

9 A. That is correct.

10 Q. So would you agree that you're not qualified
11 to give an opinion on what the legally established
12 delivery rate is?

13 A. Well, I can -- I'm not a lawyer, but I can
14 read documents and see where information comes from.

15 Q. So you talked about looking at the Unit B part
16 of the A&B project. Do you remember that testimony? I
17 think it's in your report as well.

18 A. Yes.

19 Q. And would you consider that project to be
20 similar to a large open canal system in Idaho?

21 A. I mean, there's some similarities, but one
22 difference is that the distance between the point of
23 diversion and the point of delivery is typically pretty
24 short, and there's some open canals up there, but
25 there's a lot of piping too.

1 Q. And that system has a number of groundwater
2 wells; do you recall?

3 A. I think at the time it was fully supplied by
4 groundwater. I think maybe they get some surface water
5 now.

6 Q. So I'll represent probably over 180 wells
7 delivering water to individual farms.

8 Would you agree with that?

9 A. That sounds right.

10 Q. And so these large canal systems that we're
11 looking at for the Surface Water Coalition, would you
12 agree that they have a large diversion point at the
13 Snake River not over hundreds of individual points of
14 diversion?

15 A. Yes.

16 Q. And you talk about the Director's order in
17 that case. Did you agree with the Director's and
18 hearing officers' recommended diversion rate for A&B at
19 three-quarters of an inch per acre?

20 A. No. I think that's probably too much.

21 Q. So you disagree with the finding and the
22 order?

23 A. Yeah, I don't -- I haven't studied that part
24 of the order in quite a while, so I'm a little fuzzy on
25 that piece.

1 Q. Is the requirement for a water user to put
2 water to beneficial use different when you are making a
3 call as opposed to not making a call?

4 A. I think so, yeah.

5 Q. And is that based upon your experience in
6 Idaho or other states?

7 A. I would answer in the context of Idaho, that
8 in the context of the conjunctive management rules and
9 the decisions that have been made, and all, that they're
10 expected to be operating reasonably and without waste
11 before they are curtailed -- or before juniors are
12 curtailed on their behalf.

13 Q. And does that apply to surface-to-surface
14 water right administration?

15 A. I don't know.

16 Q. So is a diversion rate of 5 to 7 acre-feet per
17 acre reasonable for large open canal systems in Idaho?

18 A. It depends. It depends on what their
19 conveyance losses are and what their on-farm irrigation
20 application practices are.

21 Q. You have a per-acre-foot, per-acre standard as
22 an industry standard?

23 A. No.

24 Q. Or would it be different for every entity?

25 A. It would vary.

1 Q. I'd like to talk to you about your
2 supplemental groundwater testimony in your report,
3 pages 20 to 21.

4 And you represent that table was provided by
5 the Surface Water Coalition; is that correct?

6 A. Yes.

7 Q. And do you know if that information related to
8 potential groundwater lands within their project or
9 specific lands that were overlapped with surface water
10 as well?

11 A. I don't remember the specifics of that.

12 Q. So would you agree that some of these projects
13 cover vast areas of certain counties in southern Idaho?

14 A. Yes.

15 Q. Not every one of those users may have a
16 surface water right; is that true?

17 A. That's true.

18 Q. Some may have groundwater?

19 A. There may be, uh-huh.

20 But I think that this information was
21 represented as supplemental groundwater acreage by the
22 canal companies, to my recollection.

23 Q. Have you compiled any information on
24 supplemental groundwater rights since 2007?

25 A. No.

1 Q. Are you aware of any groundwater right
2 transfers since that time?

3 A. Just in the ESPA.

4 Q. Yes?

5 A. Yes.

6 Q. Would that change the analysis of supplemental
7 groundwater available within certain projects?

8 A. Yes. And I don't -- I wasn't necessarily
9 advocating that these values be used, but they were put
10 in here as an example that this information has been
11 considered before and, for whatever reason, hasn't been
12 considered for a long time. And if it is to be
13 considered, would it make sense to use more recent data.

14 Q. How about groundwater rights enrolled in CREP
15 since that time?

16 COURT REPORTER: Wait, I didn't hear that.
17 Can you repeat that?

18 MR. THOMPSON: Groundwater rights enrolled in
19 CREP, C-R-E-P.

20 THE WITNESS: I mean, if they're not
21 delivering groundwater, then I don't think that should
22 be considered as an alternate source. I suppose the
23 lawyers may have some reason that legally it should be
24 considered, but...

25 Q. (BY MR. THOMPSON) How about groundwater

1 rights used in mitigation plans, have you looked at
2 those?

3 A. So what do you mean by that?

4 Q. Well, I just want to know if -- you haven't
5 done any analysis on supplemental groundwater rights
6 since that time, could those rights be not available
7 today, not being used today, if they're in other
8 programs?

9 A. Did you say enrolled in mitigation plans?

10 Q. Yes.

11 A. So the wells would still be in use?

12 Q. Maybe not. I don't know. That's the
13 question.

14 A. It should be based on the wells that are -- I
15 think that the wells that are actually in use.

16 Q. So do you know how long it takes the
17 groundwater districts to compile their annual use of
18 their members' groundwater rights?

19 A. I do not.

20 Q. One last question: Would the priority date of
21 a supplemental groundwater right matter if it was
22 subject to a curtailment order?

23 A. It might.

24 Q. I'd like to ask you a few final questions, I
25 guess, looking at Exhibit 365.

1 Do you have that in front of you?

2 A. Yes.

3 Q. How many gauges did you query for these tables
4 or graphs? I'll call them graphs.

5 A. Well, they're listed in the footnotes. I
6 haven't counted them up.

7 Q. So the only ones that are totaled here are the
8 ones actually listed --

9 A. Yes.

10 Q. -- in the notes?

11 A. Yes.

12 Q. How do you define the term "TFCC Return Flows"
13 at the top?

14 A. I think that's the -- that's the sort of
15 general terminology that's used -- that the Department
16 has used. It's return flows coming off a tract, so it's
17 measured water below that canal service area.

18 Q. So does it include water from other sources,
19 not just irrigation return flow?

20 A. It could.

21 Q. So the orange tributary bars, are those
22 natural streams?

23 A. Yes. So, I mean -- and as we heard
24 Jay Barlogi talk -- testify earlier, there's -- some of
25 their runoff off the waste or surface runoff goes into

1 tributaries.

2 Q. Certainly, during irrigation season that could
3 be a component of that flow at that particular time?

4 A. Yes.

5 Q. How about runoff precipitation events?

6 A. It could be in high -- like it rained here
7 last night.

8 Q. 3 inches, I think, at Crane Creek.

9 A. It was a lot. Almost as much as it rains down
10 in Florida now, like that.

11 Q. Did you differentiate the irrigation return
12 flows from other natural runoff in this graph?

13 A. I did.

14 Q. And it appears that some of these run
15 year-round; is that correct?

16 A. Yes, there's some water in the winter.

17 Q. Are you aware of seeps in groundwater returns
18 that might be included in these numbers?

19 A. Probably is some of that, yes.

20 MR. THOMPSON: That's all the questions I
21 have.

22 HEARING OFFICER: Okay. Thank you,
23 Mr. Thompson.

24 MR. THOMPSON: Oh, sorry. I've got a couple
25 more.

1 HEARING OFFICER: Go ahead.

2 Q. (BY MR. THOMPSON) Getting back to your
3 question on project efficiencies, would your proposed
4 use of an efficiency regression with that
5 75th percentile, essentially, disfavor seniors?

6 A. No.

7 Q. How so?

8 A. Because it would be using the efficiency
9 values that they have shown to be able to operate at.

10 Q. At certain times? Is that correct?

11 A. Yeah, but I think it's entirely reasonable to
12 be -- I'm not picking the very top, I'm just picking
13 within the upper part of the range that they've shown
14 they can operate at.

15 Q. So do you agree that large canal companies
16 would need some sort of base level to operate their
17 diversion system?

18 A. What do you mean, "base level"?

19 Q. Can they simply follow the ET curve seasonally
20 or annually crop --

21 A. Well, that's why -- well, I'm not sure if I
22 understand your question. But that's why these
23 efficiencies are not 100 percent, and there's allowances
24 for losses and inefficiencies.

25 Q. So do you agree there's beneficial diversions

1 of water to bear crops that go beyond just meeting the
2 consumptive irrigation requirement of the plan?

3 A. When you're, like, storing water and soil
4 moisture for subsequent use, yes.

5 Q. How about canal charging?

6 A. Yep. And that's the reason that the
7 efficiencies -- the conveyance efficiency can be
8 temporarily higher in the spring. Although, I
9 understand, you know, canals like Twin Falls and some
10 others run year-round now because of the recharge.

11 So maybe some of that charging part is not as
12 big a deal as it used to be.

13 Q. I guess, are you aware of the location of
14 Murtaugh Lake compared to the rest of the project on
15 Twin Falls Canal Company?

16 A. It's up near the top.

17 Q. How about having an available steady supply of
18 water, if that's how they deliver?

19 A. Can you be more specific on what you mean?

20 Q. Yeah. Do you consider that a beneficial
21 diversion of water that goes just beyond meeting the
22 crop water need for the plan?

23 A. I think that's part of the reason Twin Falls
24 is so inefficient is because they -- their operational
25 practice is to basically guarantee a rate of water to

1 their users rather than an allotment system. It's more
2 typically used by these large systems, and it leads to a
3 less efficient operation.

4 It's great for the users, and it's great if
5 you have enough water, but you can -- a system can be
6 operated more efficiently under an allotment system.
7 There's incentives for saving water.

8 Q. So which entities are you referring to that
9 use an allotment system?

10 A. I know some of the Surface Water Coalition
11 members do, but I just -- I haven't -- and that's
12 something we looked at back -- way back when. I just
13 didn't have a chance to refresh myself on that.

14 Q. How about diverting water for chemigation and
15 soil tillage, is that a beneficial use of water?

16 COURT REPORTER: Okay. Wait. Can you repeat
17 your question?

18 Q. (BY MR. THOMPSON) Using water for chemigation
19 or soil tillage, is that a beneficial use of water?

20 A. It's a beneficial use. I think it, you
21 know -- and I don't know how much of that is happening,
22 how big of a deal that is. I mean, if they're -- yeah,
23 I don't know. It's a beneficial use, though.

24 MR. THOMPSON: Thank you. That's all I have.

25 HEARING OFFICER: Thank you, Mr. Thompson.

1 Redirect?

2 MR. BUDGE: Director, the cross-examination by
3 Mr. Fletcher and especially -- and partly by
4 Mr. Thompson went way outside of what's in
5 Mr. Sullivan's expert report and what was offered in
6 direct, so I would like to also ask a few follow-up
7 questions.

8 HEARING OFFICER: Well, I'm not sure that I
9 agree with you, that it went way outside the boundaries
10 of direct.

11 I disagree, but I don't object to your asking
12 some questions. But before you do, Mr. Budge, and
13 before you come all the way forward, I want to give
14 Ms. Klahn an opportunity to ask questions.

15 MS. KLAHN: I'd rather go after Mr. Budge
16 because I don't know what he's going to say, if that's
17 okay, Mr. Director.

18 HEARING OFFICER: Well, let's stay as long as
19 we have to.

20 Mr. Budge.

21 MR. BUDGE: I'll be as quick as I can.

22 MR. FLETCHER: 30 minutes; right?

23 ///

24 ///

25 ///

CROSS-EXAMINATION

QUESTIONS BY MR. BUDGE:

Q. Thank you, Mr. Sullivan.

I want to follow up on some of the questions that were asked by Mr. Fletcher.

You'll recall there was a lot of questions about Colorado replacement water plans?

A. Yes.

Q. That is not something I am familiar with, but I assume they're governed by Colorado law?

A. Yes.

Q. And they're designed to accommodate Colorado water systems?

A. Yes.

Q. They're not governed by Idaho's conjunctive management rules?

A. No.

Q. And you're not advocating today that the Director replace the Fifth Methodology Order with --

COURT REPORTER: So, Mr. Budge, I'm going to need you to slow down, please.

MR. BUDGE: He's telling me to speed up.

COURT REPORTER: I can't get it, though.

HEARING OFFICER: No, I'm encouraging you to be more articulate.

1 MR. BUDGE: Touché.

2 MR. FLETCHER: More efficient and articulate.

3 Q. (BY MR. BUDGE) You're not advocating the
4 Director replace the Fifth Methodology Order with a
5 Colorado replacement water plan?

6 A. No.

7 Q. Let me ask you about a question Mr. Fletcher
8 asked about some rulings by Judge Melanson related to
9 the five-eighths-inch versus three-quarter-inch delivery
10 for Twin Falls Canal Company.

11 Do you remember those questions?

12 A. Yes.

13 Q. Do you remember Mr. Fletcher asking if you
14 knew that Judge Melanson had rejected or overruled the
15 five-eighths-inch standard?

16 A. Yes.

17 Q. And your response was that you'll take
18 Mr. Fletcher's word for it?

19 A. Yes.

20 Q. So the record's clear, you don't know
21 whether -- that Judge Melanson accepted five-eighths
22 inch or three-quarters of an inch?

23 A. No.

24 Q. And to the extent that's in the record, that
25 would reflect Mr. Fletcher's testimony and not your own?

1 A. Yes.

2 Q. Mr. Fletcher asked you if there had been any
3 curtailment of groundwater rights to date, and I believe
4 your answer to that was, to your knowledge, no?

5 A. This year?

6 Q. I think it was to date.

7 A. To date this year; right?

8 Q. Yes. Was your answer with respect to this
9 year alone?

10 A. Yes.

11 Q. Okay. You weren't referring to curtailment in
12 prior years?

13 A. No.

14 Q. There was a dialog between you and
15 Mr. Fletcher about who should be curtailed when the
16 seniors are short of water.

17 You said something to the effect that those
18 who caused the problem should be curtailed; is that
19 right?

20 A. Yes.

21 Q. You also testified that curtailment is
22 extremely inefficient in the conjunctive management
23 context?

24 A. Very.

25 Q. And it should be a matter of last resort?

1 A. Yes.

2 Q. And so it's fair to say that your testimony
3 has been that curtailment should only be pursued to meet
4 genuine water needs by the senior?

5 A. Well, not exactly. I mean mitigation should
6 be provided to meet genuine water need, and curtailment,
7 like I say, is a -- at last resort. If the user doesn't
8 want to mitigate, then they shouldn't be allowed to
9 pump.

10 Q. And in terms of calculating mitigation
11 obligations, mitigation should only be required to the
12 extent the senior actually needs it to grow crops?

13 A. Yes.

14 Q. And did I understand your testimony that the
15 Fifth Methodology Order has created no incentive for
16 seniors to become more efficient in their water use?

17 A. That's correct.

18 Q. In fact, if I understood your testimony
19 earlier, there's some incentive built into the
20 methodology that encourages the seniors to divert more
21 water than may be required for their crops?

22 A. Yes. There's this feedback loop that the more
23 they divert, the more they're entitled to under the
24 methodology.

25 Q. And then, lastly, there was some discussion

1 about prior court rulings involving reasonable use of
2 water. And I think Mr. Fletcher represented that a
3 prior decision found Twin Falls Canal's diversions to be
4 reasonable.

5 Do you remember that?

6 A. Yes.

7 Q. Do you recall whether that decision was based
8 on efficiency or just based on whether Twin Falls was
9 wasting water?

10 A. I don't recall.

11 Q. And efficiency is a spectrum. You can be
12 highly efficient or --

13 A. Absolutely.

14 Q. -- poorly efficient?

15 And the waste threshold, as you understand
16 that, would be at the very bottom end of the spectrum?

17 A. Well, my understanding is that it's -- they're
18 really two sides to the same coin, the way that it's
19 evolved and put out in the conjunctive management rules
20 and the decisions that are being made.

21 If you're operating with reasonable
22 efficiency, you're not wasting, and if you're wasting,
23 then you're not operating with reasonable efficiency.

24 I used to think there was, like, some multiple
25 tiers, but I don't think that anymore.

1 Q. Does your analysis show that since 2008 when
2 the Methodology Order was first developed and we last
3 had an evidentiary hearing, that Twin Falls Canal
4 Company and other members of the Surface Water Coalition
5 are not demonstrating increased efficiency even though
6 you would expect that given the improvements made to the
7 canal system?

8 A. Yes, that's correct.

9 MR. BUDGE: That's all I've got. Thank you.

10 HEARING OFFICER: Mr. Budge, I want to
11 compliment you on your articulate questioning of the
12 witness.

13 MR. BUDGE: It's about time.

14 MS. KLAHN: It was a lot less than ten
15 minutes, TJ.

16 HEARING OFFICER: I did not mean it as a
17 personal shot at you, so please accept my apology.

18 I also want to observe in the -- as I scanned
19 the document and as I listened to the testimony, that
20 the expert report is replete with references that say
21 "in Colorado" and "in Colorado" and "in Colorado," as
22 well as the testimony. I'll just observe that I think
23 there's a lot of reference there, but I won't draw any
24 more conclusions than that.

25 So, Ms. Klahn, from Colorado, you may question

1 the witness from Colorado.

2 THE WITNESS: I'm not in Colorado anymore.

3 MS. KLAHN: He's from Florida now.

4 HEARING OFFICER: Florida now, huh?

5 MR. FLETCHER: I can't wait to hear what they
6 do in Florida.

7 HEARING OFFICER: Following the water
8 problems.

9 MR. FLETCHER: The drain ditch problems.

10 MS. KLAHN: You should see the returns flows
11 down there.

12 HEARING OFFICER: Ms. Klahn?

13 MS. KLAHN: Thank you.

14

15 REDIRECT EXAMINATION

16 QUESTIONS BY MS. KLAHN:

17 Q. Just a couple of things.

18 The discussion you had with Mr. Fletcher about
19 the project efficiency aspects of crop water need, do
20 you recall that?

21 A. Yeah.

22 Q. And I feel like there might have been some
23 confusion about what the Methodology Order calculates
24 and what's shown in Figures 3-1, et cetera, versus what
25 your conclusions are.

1 Could we take a look at that real quick?

2 A. Sure. 3-1?

3 Q. Yeah. So in Figure 3-1, just to make sure the
4 testimony is clear, you included on that figure your --
5 I don't remember what the terminology is because I
6 didn't bring the report up with me -- the efficiency
7 number you calculated in 2007; is that right?

8 A. Yeah, the seasonal efficiency. That's the
9 blue lines.

10 Q. Right. And that was for purposes of
11 comparison with the actual efficiencies that the Surface
12 Water Coalition is currently experiencing; is that
13 right?

14 A. That's one of the purposes, yes.

15 Q. Okay. There was a question about the --
16 whether chemigation and soil tillage were beneficial
17 uses; do you recall that?

18 A. Yes.

19 Q. Would you agree that chemigation and soil
20 tillage are not part of the crop water need?

21 A. I don't know.

22 MS. KLAHN: And I think those are all the
23 questions I have, Mr. Director. Thank you.

24 HEARING OFFICER: Thank you for being
25 succinct.

1 Recross?

2 Recross, Mr. Fletcher?

3 MR. FLETCHER: No, I don't have any.

4 HEARING OFFICER: Mr. Thompson?

5 MR. THOMPSON: No. Thank you.

6 HEARING OFFICER: Okay. Are we finished with
7 Mr. Sullivan?

8 MS. KLAHN: I think so.

9 HEARING OFFICER: It sounds like we are.

10 Okay. It's 5:00 o'clock. The timing of
11 examination of counsel is admirable.

12 Do we want to call the next witness? I assume
13 not?

14 So looking at the schedule, I assume that
15 Sophia Sigstedt will be scheduled tomorrow morning to
16 testify, is that right, Ms. Klahn?

17 MS. PATTERSON: That's correct.

18 HEARING OFFICER: Oh, wait a minute.

19 TJ?

20 MR. BUDGE: That's correct.

21 HEARING OFFICER: Do you want to start at
22 9:00, everyone? Are we on schedule to finish on Friday,
23 looking at the witness list?

24 MS. PATTERSON: I think we are, Director. We
25 are only going to call one late witness, Mr. Carlquist.

1 And then I believe we just have a witness from
2 Amalgamated, a witness from McCain, and then your expert
3 witnesses.

4 I think that we can get Ms. Sigstedt and
5 Mr. Contor done by midday tomorrow, leaving time in the
6 afternoon for rebuttal.

7 MR. BUDGE: That's only if they'll be as
8 succinct as I am.

9 MS. KLAHN: No, you're not succinct, I'm
10 succinct.

11 HEARING OFFICER: And articulate.

12 MR. JOHNS: I can't make any promises about
13 midday.

14 MR. FLETCHER: You're articulate, she's
15 succinct.

16 HEARING OFFICER: Let's go off the record
17 because we're devolving downward, I think. So let's go
18 off the record.

19 So we'll adjourn until tomorrow at 9:00 a.m.

20

21 (Hearing adjourned at 5:03 p.m.)

22

23

24

25

REPORTER'S CERTIFICATE

I, ANDREA L. CHECK, CSR No. 748, Certified Shorthand Reporter, certify;

That the foregoing proceedings were taken before me at the time and place therein set forth, at which time the witness was put under oath;

That the testimony and all objections made were recorded stenographically by me and transcribed by me or under my direction;

That the foregoing is a true and correct record of all testimony given, to the best of my ability;

I further certify that I am not a relative or employee of any attorney or party, nor am I financially interested in the action.

IN WITNESS WHEREOF, I set my hand and seal this 19th day of June, 2023.

Andrea Check

ANDREA L. CHECK, CSR No. 748, RPR, CRR

Notary Public

P.O. Box 2636

Boise, Idaho 83701-2636

My Commission expires July 20, 2028.

	177:7	40:5;41:5,23,24;50:4,7,9,12,14,16,18,21,24;52:9,23;53:3,20,22;54:1,3,7,12;58:7;67:21,24;68:12;79:20;81:20;82:12;83:2,25;84:5;85:4,7;86:3,7,19;87:24;88:5,6,11,11;97:7;101:8;107:2,4;134:23;160:1;167:13;174:3,24;175:2,7,18,20,23;176:2,7,15;177:6,13,16,21;178:3,21;179:21;184:23;216:18;217:1,3,7,21,22;218:3,7,9;221:15;223:9;224:8,10	Adjudication (4) 81:9;82:1,2,4
\$	accepted (4) 125:14;199:19;200:22; 248:21	Act (1) 63:23	adjust (1) 148:16
\$1.8 (1) 98:20	access (1) 85:20	action (1) 23:6	adjusted (4) 148:14;167:20,22,23
\$27 (1) 24:21	accommodate (1) 247:12	actions (2) 124:14,16	administer (1) 203:15
\$8 (1) 103:7	according (3) 24:10;66:22;204:20	activities (4) 16:25;17:3,5;21:6	administered (1) 153:18
&	account (1) 136:25	actual (21) 91:17;134:25;135:2,5; 141:19,20,20;144:10;145:5; 146:2;160:15;168:6,7,12; 173:17;218:8;220:23; 227:17,20,22;254:11	administering (1) 203:22
&gt;+/-2 (1) 155:10	accountant (3) 45:17;47:25;102:21	actually (33) 10:23;55:9;57:3;85:5; 93:7;95:17;103:18;113:17; 151:14;157:22;158:5; 163:20;164:4,5;167:24; 168:12;170:25;173:14; 175:23;177:13;185:13; 188:13;195:5,18;204:11,16; 214:2;219:23;227:18,24; 240:15;241:8;250:12	administration (9) 135:3;147:19;184:3; 186:4;203:13;205:21;225:7; 226:10;237:14
/	accounted (1) 61:19	add (1) 32:22	administrative (1) 216:10
/// (7) 110:25;197:25;229:24,25; 246:23,24,25	accounting (7) 15:8;213:10,18,19,25; 214:23;215:21	added (2) 128:16;169:7	administratively (1) 186:17
[accruing (1) 93:6	adding (1) 167:7	admirable (1) 255:11
[As (1) 66:8	accumulate (1) 18:3	addition (3) 122:3;162:12;214:3	admission (6) 22:3;48:19;68:20,24; 69:14;112:14
[sic] (1) 45:11	accurate (5) 53:22;72:17;73:7;85:15,25	additional (13) 21:13;48:7;85:10,11;91:9; 13:97:11;126:9;144:14; 149:16;156:17;175:5;187:8	admit (2) 48:15;163:12
[Witness (4) 39:10;43:22;105:20; 106:20	accurately (2) 71:8;136:25	address (3) 8:23;11:5;200:3	admitted (1) 94:13
A	achievable (1) 200:5	addressed (2) 12:2;47:6	adopt (1) 215:17
A&B (13) 13:15;113:7;137:19; 138:10;141:24;143:8; 152:19;153:1,10;157:12; 230:4;235:16;236:18	achieve (1) 185:6	adds (1) 218:2	adverse (1) 19:22
ability (6) 92:19;123:20;146:15; 180:10;181:1;201:18	acre (13) 25:13;27:5;39:23;40:2; 41:6;66:9;79:21;92:13; 223:7,8;225:1;236:19; 237:17	adequate (2) 121:17;137:22	advise (1) 218:5
able (13) 24:3;47:18;93:1;115:17; 121:23;122:2;131:4;137:21; 138:14;142:1;143:16; 217:14;243:9	acreage (18) 53:25;78:4;84:25;85:15, 25;87:21;105:4;173:11; 174:6,9;175:15;178:7; 181:18;216:12,17;218:7,8; 238:21	adjourn (1) 256:19	advocated (1) 201:9
above (16) 70:11;126:11;128:20; 131:13;157:6;165:4;169:1; 171:2;230:19;231:1,3; 232:13;233:9;234:12,14,17	acre-feet (73) 35:9;40:25;41:5,7,13,15, 22,25;43:24;44:5;71:19; 72:11,14,22;73:10,19,23; 74:9,14,25;96:7;127:1,2; 128:2,4;129:12,15,16,17,19; 130:7,10;152:12,13,14; 184:16,24,25;185:1,5,6,8,9, 13,14,15,16,17,22;189:2,14; 190:8,11,15,16,22,25;191:4; 204:25;207:3;209:16,20; 210:23;211:12;223:7,8,14, 18,19;224:25;228:13; 230:25;237:16	adjourned (1) 256:21	advocating (4) 201:16;239:9;247:18; 248:3
above-average (2) 126:7;232:2	acre-foot (1) 103:25	adjudicated (1) 113:12	aerial (1) 174:18
Absolutely (9) 21:3;28:2;34:6;46:22; 75:13;90:5;105:6;207:16; 251:13	acres (89) 24:15;29:25;32:21;33:4; 34:25;36:18,25;37:15,24;		affect (1) 125:12
accelerated (1) 80:18			affects (1) 105:5
accept (5) 10:24;22:19;23:1;41:8; 252:17			afloat (1) 208:12
acceptable (1)			AFRD (1) 158:17
			AFRD2 (6) 143:5;151:16;154:2; 172:12,14,16
			afternoon (9) 111:20,21;179:2,8;198:3, 4;230:3,5;256:6
			ag (1) 79:25
			again (36) 12:6;19:12;27:13;33:17; 37:4;38:13;40:4;51:24; 56:24;57:25;58:13;59:5; 68:25;73:3;74:16;83:9;

<p>86:18;94:24;101:10,10,12, 13,13;104:22;109:15; 139:20;153:7;159:23; 172:17,24;179:8;180:18; 191:8;198:5;227:23;232:9 against (4) 150:6,15;156:12;225:14 agencies (1) 192:13 agency (3) 212:7;213:22,23 ages (1) 107:22 ago (3) 76:19;105:21;174:11 agree (37) 25:13,20;29:7;36:7;48:2; 74:18;82:11;102:23,25; 105:4;106:18;132:3;133:14; 180:23;183:18;201:20; 202:15;204:7;220:20;226:2; 229:6;230:18;231:3,9,25; 233:1,14;234:3;235:10; 236:8,12,17;238:12;243:15, 25;246:9;254:19 agreed (3) 35:24;40:6;67:4 agreeing (1) 49:1 agrees (1) 132:24 agriculture (1) 207:8 ahead (5) 8:9;38:14;70:1;215:19; 243:1 al (2) 13:15;230:4 alfalfa (8) 32:20,20;33:5;87:1;88:7; 105:1;107:5,16 alleviate (1) 202:8 alleviating (1) 203:19 allocated (1) 11:23 allocating (1) 11:22 allocation (1) 168:13 allotment (6) 143:23,24;144:3;245:1,6,9 allotted (1) 66:9 allow (11) 9:21;12:7;22:23;45:1; 51:19;58:12;94:19;99:24; 162:14;179:23;186:13 allowances (1) 243:23 allowed (5) 47:16;63:24;207:24;</p>	<p>214:11;250:8 allowing (1) 231:16 allows (1) 206:2 almost (5) 34:11;67:14;123:11; 222:25;242:9 alone (3) 147:11;207:22;249:9 along (8) 17:9;57:1;59:22;100:4; 140:16;144:23;189:21; 194:19 alternate (3) 149:3,6;239:22 alternative (5) 149:14;169:17;186:6,7,8 alternatives (2) 161:5;171:16 Although (1) 244:8 always (10) 16:4;19:2;21:2;80:13; 91:11;134:25;160:8;196:22, 25;212:12 Amalgamated (1) 256:2 amending (1) 12:5 amendment (1) 11:2 among (3) 11:23;75:19;88:24 amongst (3) 68:1;102:15,16 amount (48) 16:23;39:14;40:1;43:8; 61:23;66:18;70:14,18,22; 71:5;88:9;92:17;93:3,10,12; 97:5,6,7;102:5,9;103:2,3; 127:3;128:10;129:16;130:5; 151:22;152:7;160:6;178:14; 190:1,4;202:3;203:10;204:3, 3,18;205:9;210:19;211:5; 212:24;220:10,10;222:9; 223:17;225:23;226:4;229:8 amounts (3) 184:6;202:7;206:25 analyses (6) 119:8;135:24,24;136:18; 174:14;199:7 analysis (36) 114:23;130:15;133:7; 135:18;137:16;148:17; 149:16;158:3;166:20,24; 167:5,6,9,9,22;168:3,16; 169:14;170:24;171:4; 172:16;174:17,19;175:9; 177:15,19,22;199:16; 202:12;206:3;227:3,18; 228:20;239:6;240:5;252:1 analytical (1)</p>	<p>228:20 analyze (2) 129:21;135:12 analyzed (3) 130:17;145:7;225:17 analyzing (3) 123:17;136:1;224:16 Anders (7) 42:23;43:15,17,20;44:8; 131:20;134:22 Anderson (7) 9:1;99:9,12,14,16,19; 100:12 Andrea (6) 8:6,8,10;10:18;60:7;68:22 anecdotally (1) 122:25 annual (40) 15:20;72:15;102:20,24; 103:1,5;141:4;143:22;144:2, 20;145:12;150:5,7,14,14,15, 24,25;151:1,2,3,3,5;152:23; 155:25;156:1,6,6,11,12; 167:5,7,11,12;168:23; 172:11;194:16;214:18,25; 240:17 annually (4) 52:23;83:3;84:4;243:20 answered (3) 51:15;58:16;146:24 anticipate (1) 45:2 anticipating (1) 23:9 anymore (3) 67:21;251:25;253:2 anyways (2) 127:21;171:9 apologize (3) 98:8;120:25;154:24 apology (1) 252:17 apparently (2) 22:1;228:1 appeal (2) 9:24;125:2 appear (2) 210:22;211:6 appears (2) 161:8;242:14 application (6) 28:18;59:24;60:23; 103:10;138:7;237:20 applied (3) 37:14;135:14;177:5 apply (8) 28:7;92:13,16;149:11,15; 160:24;172:25;237:13 applying (1) 163:22 appreciate (2) 23:19;24:3 approach (8)</p>	<p>15:10;135:15;148:7;149:3, 7,9;184:14;189:15 approaches (1) 133:2 appropriate (4) 16:22;110:12;128:24; 217:3 appropriator (1) 11:17 appropriators (3) 11:11,21;36:23 approval (1) 67:8 approve (2) 28:20,21 approved (8) 186:18,20,24;187:13; 211:25;212:5,7;231:11 approximately (5) 29:14,16;41:7;184:16,19 April (12) 15:20;31:14;153:4; 157:13;159:19;165:6,15,15, 16,16;184:10;232:24 Aqua (1) 193:9 aquifer (4) 108:24;113:23;184:4; 192:24 arbitrary (3) 124:11,14,16 archives (1) 22:10 area (38) 32:17;36:19;37:25;41:11, 20;49:22;53:9;54:8,10;62:6; 69:10;77:14;78:8;83:19; 84:22;86:24;87:11,22;109:7; 112:23;122:11;145:11,11, 16;146:10;173:9,16,22; 174:17;177:25;194:19; 195:2,6,22;207:9;218:11; 231:16;241:17 areas (7) 88:17;97:9;174:14;175:5, 5;214:10;238:13 arguably (1) 68:15 argue (2) 35:18;43:6 argued (1) 11:14 argumentative (2) 58:10,24 Arguments (1) 231:20 army (1) 148:2 around (20) 16:8;20:21;21:7;52:15; 59:18;63:1;71:18;72:16,18; 74:19;79:20;88:7;92:21; 93:2;108:21;129:3,4;190:7;</p>
--	--	--	---

207:12;223:14 articulate (5) 247:25;248:2;252:11; 256:11,14 As-Applied (5) 121:7,18;122:4;184:10; 202:12 ascertain (1) 78:11 aspects (1) 253:19 assertion (1) 76:8 assessment (4) 24:17,25;25:3;135:15 assessments (1) 24:23 assist (2) 88:2;202:6 assisted (1) 113:10 associated (3) 11:1;98:23;129:11 assume (14) 13:11;42:14;61:23;72:12; 75:6,7;87:2;89:20;90:8; 109:20;229:19;247:10; 255:12,14 Assuming (7) 51:20;56:16;75:4;124:25; 191:15;197:16;218:18 attached (1) 64:9 Attachment (5) 63:5,6,11,13;103:9 attachments (1) 81:5 attempt (3) 45:25;46:2;88:17 attempted (2) 60:12;180:7 attempting (1) 181:9 attended (1) 120:1 attorney (1) 235:8 attorneys (2) 21:25;23:20 attracts (1) 27:19 attributable (1) 192:24 augmentation (2) 212:5,10 augmentations (1) 212:4 August (5) 87:17;90:3;153:6;220:14; 222:16 authorize (1) 81:19 authorized (1)	89:20 automated (2) 20:18;90:19 automation (3) 75:18;90:18;123:1 available (14) 41:6;89:9,24;91:9,14; 93:11;213:12;218:21;219:3, 4;229:13;239:7;240:6; 244:17 average (70) 72:22;79:21;87:11;126:5, 9,10,11,12,19;127:1,8,18; 128:2,9,10,17,19,20,23; 129:18;130:7;131:13; 140:23,24;141:21;145:1,1,4; 150:24;161:14;162:15; 163:3,4,16,25;164:2,21,25; 166:9;169:5,10,23;170:11; 171:5,6,9;227:8,16;230:10, 17,18,19,22,23;231:1,3,9,21, 25;232:7,11,13;233:7,9; 234:7,10,12,14,17,18 averaged (1) 72:10 averages (1) 173:7 averaging (3) 129:23;219:7,13 avoid (1) 79:3 aware (9) 45:18;50:10;182:23; 192:5;231:22;233:17;239:1; 242:17;244:13 away (2) 115:15;196:17 axis (1) 189:21	bad (1) 77:8 balance (2) 68:15;215:1 balancing (1) 214:24 baled (1) 34:18 ballpark (1) 90:20 banks (1) 21:13 bar (2) 15:17,18 barley (11) 86:25;87:12,24;88:5,11; 104:25;105:22;106:11,13, 23;107:4 barley's (1) 106:24 Barlogi (70) 12:24,25;13:3,6,19,21; 14:15;19:7;21:19;22:2,17; 23:17,21,24;24:9;29:5;30:2, 4;32:3,13;35:19;36:4,20; 37:13,20;38:19;39:1,41:4; 42:2;43:13;45:7;47:9,21; 49:1,11,21;52:20;54:11,14, 18,23;55:3;56:14,25;59:3; 60:3,20;62:13;65:5,13;67:9; 69:8,21;70:6;76:6;78:24; 100:18;105:2,16;107:22; 108:2;109:16,17,24;110:2; 123:2;148:4;195:25;224:9; 241:24 B-a-r-l-o-g-i (1) 13:22 Barlogi's (2) 110:7;228:5 barriers (1) 100:1 bars (1) 241:21 base (3) 46:24;243:16,18 based (45) 9:19;11:23;14:18;35:24; 66:22;82:2,9;100:5;108:12; 110:12;126:21;128:21,25; 138:15;141:6;147:2,2;157:9; 161:7;167:15;168:5,16; 169:4,19;170:17;171:8; 173:17,24;174:7,10,18; 177:4;180:22;186:8,9; 188:24;215:21;225:20; 227:14;228:22;233:5;237:5; 240:14;251:7,8 baseline (42) 73:1,5,9,17,21;74:8,13; 75:4;84:19,19;122:8;125:22, 23;126:5,10,15,20,25; 127:12,22,25;128:13,19,22, 23,25;129:6,8,17,19;130:12;	131:7,12,13,15;228:19; 230:14;234:4,6,11,12,21 basic (1) 126:2 basically (12) 122:7;124:8;138:10; 142:21;143:15;150:3; 151:11;153:17;189:22; 196:23;230:15;244:25 Basin (4) 81:9;82:2;187:21;215:14 basis (13) 11:22;19:2;79:14,14; 136:1;140:7;151:1,5,5; 167:6;169:3;197:5;228:4 Bates (2) 38:21,23 BAXTER (2) 12:15,17 bean (1) 17:18 beans (1) 87:1 Bear (3) 21:6;92:23;244:1 become (6) 75:13;94:21;131:14; 206:22;213:16;250:16 becomes (4) 96:10;148:16;160:4;226:6 beet (1) 88:7 beets (5) 26:11;87:1;105:24;106:12, 19 begin (3) 59:13;70:9;88:19 beginning (9) 17:10,11,20;18:3;31:6; 68:4;71:14;113:6;168:10 begs (1) 185:24 behalf (4) 23:16;36:23;53:6;237:12 behind (3) 14:7;88:18;134:2 belief (1) 37:13 below (13) 42:24;84:18;126:12,18; 128:10;129:17;142:3; 144:17;146:21;165:4; 234:17,18;241:17 benchmark (2) 127:17,18 beneficial (9) 82:3;237:2;243:25; 244:20;245:15,19,20,23; 254:16 benefit (5) 11:18;32:2;47:15,17; 225:20 benefits (1)
B			
	baby (1) 173:1 back (60) 10:1,5,17;34:19;46:7; 48:14;59:20;69:23,25;70:12; 75:20;90:11;96:23,23;97:11, 13,14;101:8,12;102:6; 109:17;110:2,18,21;115:18, 19;116:14;118:4,10;135:11, 22;148:10;149:25;156:7; 164:24;176:3;179:5,7; 185:18,20,21,22;188:2; 190:10,14;192:15,21;204:5; 205:4;207:11;219:21; 227:11;229:10,11;230:7; 231:7;234:25;243:2;245:12, 12 backstop (1) 183:13 backup (1) 127:4		

<p>48:4 berms (1) 18:20 beside (1) 45:17 best (6) 49:10;66:24,24;70:22; 87:10;150:19 better (19) 15:12;29:2,4;92:20;111:9; 123:5,20;133:6,7,7;146:6; 161:13;177:21;182:19; 187:25;196:22;197:14; 206:2;218:17 beyond (7) 47:8;91:21;97:15;132:14; 163:12;244:1,21 bias (2) 181:8,9 BID (1) 154:7 bifurcates (1) 16:9 big (10) 32:18;34:5;46:13;62:8,11; 92:24;107:13;171:24; 244:12;245:22 big-box (1) 52:6 binder (5) 14:8;36:12;40:22;100:21; 116:1 bisect (1) 195:1 bit (21) 19:8;26:9;90:13;115:14; 126:12;127:24;128:3; 132:20;134:5,19;142:3; 143:13;147:13;169:9;173:8; 178:3;181:25;182:6;190:7; 219:19;230:7 black (18) 110:17;140:17,22;141:18; 142:3;145:2,2,24,25;150:23, 23;151:6,22;153:15,17; 154:4,9;155:6 Blackfoot (4) 185:1,6;190:2,21 blue (13) 31:1,3;141:3,19;146:9,11; 147:5,12,15;155:9;165:13; 194:24;254:9 board (5) 28:17;61:8,20,22;64:15 book (2) 73:11;83:6 both (13) 11:20;16:11;19:24;23:19; 76:1,3,16;113:20,21;135:18; 143:17;144:18;192:4 bother (1) 148:23 bottom (15)</p>	<p>20:15;38:24;39:8;84:15; 119:16;124:10;140:16,25; 144:23;153:6;189:21; 194:20,21;209:11;251:16 bottoms (2) 17:17;18:18 bought (2) 67:22,23 boundaries (2) 181:18;246:9 boundary (3) 44:13;50:23;52:7 bow (1) 159:8 breach (2) 208:14,16 breached (1) 206:17 breaching (1) 208:18 Break (13) 10:16;65:19;69:22,24; 88:3;110:20,22;118:2;172:8; 179:2,4,5,6 breaks (1) 21:14 Bricker (20) 70:1,2,5;72:6,8,9;73:12,14, 24;74:3,6;75:24;76:1,3,5; 78:15,18;104:15;117:22; 120:17 briefly (4) 81:2,4,7;132:8 bring (3) 17:25;94:7;254:6 brings (2) 49:19;136:21 Brockway (2) 124:22;176:11 Brockway's (2) 125:6,8 broke (1) 118:13 BROMLEY (67) 22:4;23:14,15,16;24:8; 37:8,10;38:14,15,19,22;39:1; 40:16,18,19;45:4,5,7;47:2, 13,14;48:3,13,24;49:8,14,19, 21;51:16,22;54:25;55:2,3,17, 22;56:1,9,13,14,19,22,25; 58:18;59:1,3;60:4,6,9,11,14, 19;65:3,6,9,12;68:17;69:1,2, 6,18,20,21;82:25;97:24; 103:9;116:10;117:15 brought (2) 32:24;126:2 Budge (41) 22:5,6;23:4,5,11;53:6,17; 78:19,20,23;91:23,24;92:2,3; 99:4,6;103:14;105:12,15; 107:17;108:2;109:11;110:6, 8,11,14;246:2,12,15,20,21; 247:2,20,22;248:1,3;252:9,</p>	<p>10,13;255:20;256:7 budget (2) 103:5;199:6 budgeted (1) 98:20 build (1) 158:2 built (6) 20:21;44:19;52:7;97:16, 19;250:19 built-in (1) 143:24 bullet (1) 124:15 bullets (1) 119:16 bunch (3) 135:21;181:15;195:2 Burley (2) 175:9;217:9 business (2) 163:12;181:5 Butte (1) 16:9 butts (1) 146:11 bypass (1) 63:1</p> <p style="text-align: center;">C</p> <p>calculate (9) 84:25;85:6;131:23,24; 136:16,19;214:12;220:23; 226:21 calculated (3) 158:1;170:17;254:7 calculates (1) 253:23 calculating (2) 128:12;250:10 calculation (7) 128:7;131:23;132:4; 134:21;137:4;151:10;226:21 calculations (3) 132:9;136:15;217:4 calibrated (1) 215:10 calibration (1) 193:1 call (46) 11:1,10;16:18;27:18;28:5; 37:12,19;38:1;39:4;54:15; 57:15,23;58:6,14,15,17;79:1; 113:6,8,8;114:6,8;118:15,18, 22,23;119:1;126:19,22; 131:10;137:18;138:16; 145:21;147:20;148:9; 150:16;164:12;181:12; 198:10;201:23;219:2;237:3, 3;241:4;255:12,25 called (12) 12:24;13:7;39:8;59:10;</p>	<p>62:8,11;64:6;111:2;134:25; 144:24;212:3,23 calling (2) 34:9;225:2 calls (4) 16:20;39:25;113:2;137:14 came (5) 34:15;46:6;61:7;141:22; 201:10 Can (143) 10:7,13,21;13:19;14:12; 15:15,25;16:25;17:9,24; 18:14,19;19:7;20:5;21:15; 22:16;28:9;30:20;33:18,21; 35:14;37:16;44:23;46:4,8; 47:7;49:10,13;53:21;65:2; 71:5,11,14;73:12;74:16; 78:11;81:4;88:23;90:3;96:9; 100:9,20,23;101:2;102:18; 104:10,19;106:25;107:12, 14;109:17,21,24;111:6,10; 112:17;113:13;114:10; 116:10;117:2,4,12,13,16; 122:1;136:25;141:11;144:3; 146:10;151:4,6,15;152:2,20; 153:11,23;154:19,21; 155:21;156:20,23;157:8,13; 159:16;160:5;161:2;164:19, 24;165:20,23;166:5,14; 171:17,23;172:8,18;175:19; 177:20;178:4,10;179:1,19; 181:6;183:4;186:10,19; 187:22;188:4;190:9,13,19; 191:3,17;193:13;194:4; 196:8,9,11,11,15;197:5; 212:7,20;213:25;218:5; 219:4;222:20;223:13,16; 232:9;235:13,13;239:17; 243:14,19;244:7,19;245:5,5, 16;246:21;251:11;256:4 Canal (127) 13:24;14:17,25;16:5,8,10; 18:22;20:3,7,13,13,14,15,16, 20,24;21:7,14;22:11;24:10, 14;26:22;29:13;33:15;35:14; 36:19;37:24;39:18;40:10,10; 41:12;42:4;44:4,13;46:10; 47:22;52:5;53:3,19;55:10; 56:7;57:4,14,17,22;58:5,6,8; 59:13;63:23;66:10,17;67:1; 68:6;70:10;71:7;74:8,13,24; 75:9,12;76:9,11,16,20;77:2, 7,13,25;79:13;80:20;81:14; 83:1;84:5;85:1,3,20,24;86:3; 90:8,14,25;91:1,9;92:11; 94:18,18;95:17;98:1;101:5, 16,18;102:12,13;105:3; 109:8;110:4;123:1;142:18; 143:3;146:6;152:17;166:25; 191:25;192:6,10;193:19; 195:2;196:1;200:18;225:11, 25;226:2,7;228:9;235:3,20; 236:10;237:17;238:22;</p>
---	---	--	---

<p>241:17;243:15;244:5,15; 248:10;252:3,7 canals (16) 16:13,15;17:9,16,17,22,23; 18:1,5,18;75:17;220:3,19; 221:15;235:24;244:9 Canal's (3) 89:16;107:7;251:3 Candice (2) 8:18,20 Canyon (2) 97:15,16 capacities (1) 94:18 capacity (8) 21:7,8;28:12;66:10;94:19; 97:17,19;220:19 capped (1) 207:2 capricious (1) 124:14 capture (1) 10:20 captured (1) 102:5 career (2) 112:19,25 carefully (3) 54:4;143:19;226:8 Carey (1) 63:23 Carlquist (1) 255:25 carry (2) 220:9;222:15 carrying (1) 66:9 carryover (1) 200:11 case (11) 37:3;67:21;119:10,11; 152:22;163:21;191:17; 199:18;231:20;233:25; 236:17 cases (10) 97:16;141:15,19;142:2; 151:6,7,8;154:10;171:17,24 cash (1) 106:18 categories (1) 195:11 caught (2) 88:17,19 cause (3) 13:9;21:13;111:4 caused (7) 190:21;191:7;209:21,23; 212:21;229:3;249:18 causing (2) 79:24;203:5 CDL (1) 219:2 census (1)</p>	<p>49:9 centered (1) 21:7 certain (19) 46:5;78:11;86:15,17; 108:8,12;109:19;124:8; 177:6;212:19;213:22;226:3, 14;233:15,17,25;238:13; 239:7;243:10 Certainly (29) 16:3;17:4;18:5;20:8; 29:19;33:12;37:16;47:8; 50:25;52:3;71:4,10;74:3; 77:9;78:13;80:14;82:15; 83:24;86:13;90:12;92:18; 102:7;108:4,7,11,14;125:2; 226:6;242:2 certificate (2) 27:23;83:19 certificates (2) 27:17,21 certified (1) 215:11 cetera (1) 253:24 cfs (8) 66:12;89:23,25;90:10; 103:16,18,24;104:4 challenge (2) 96:10;177:10 challenges (1) 79:24 chance (4) 22:1;81:6;115:12;245:13 change (17) 27:20;78:4;117:3;122:14; 127:5;133:6,6;137:10,12; 178:3,4;182:7,12,13;196:4; 202:11;239:6 changed (18) 19:13;27:23;34:22;35:7; 53:25;54:3;55:24;70:15; 97:5;117:10,10;119:12; 126:10;127:11,23;132:11; 196:2;227:25 changes (15) 28:3,5;54:6;79:25;123:12, 13,14;127:15;171:19,20,23, 24;172:8,18;208:12 changing (5) 151:21;158:20;159:22,22; 160:11 channel (2) 18:20;63:1 channels (1) 17:13 characterization (2) 196:7;207:17 characterize (3) 20:25;135:14;182:9 charging (2) 244:5,11 chart (4)</p>	<p>43:9;204:8,20;228:12 charts (1) 152:22 Check (2) 8:6,10 checking (1) 148:3 checks (1) 149:16 chemicals (1) 18:6 chemigation (4) 245:14,18;254:16,19 chief (1) 191:17 chokes (1) 18:8 chop (1) 34:9 choppers (1) 34:1 chose (2) 132:22;227:2 Chris (3) 23:16;38:21;55:16 Chuck (1) 176:11 CIR (5) 159:25;167:14;173:16; 175:20,24 Cites (1) 23:16 cities (6) 36:5;112:4;114:3,4; 201:25;206:12 citing (1) 101:15 City (6) 39:22;111:2,22;114:2,2; 206:11 claim (1) 72:15 claims (2) 113:11,11 clarify (3) 79:5,10;117:9 clarifying (1) 193:20 clean (2) 46:8;69:7 cleaned (1) 18:21 cleaning (3) 17:16,17,22 Clear (12) 11:7,7;47:19;82:25; 111:11;124:12;168:15; 180:3;217:9,12;248:20; 254:4 clearly (1) 72:18 client (2) 206:11;210:10</p>	<p>clients (3) 113:10;207:6,7 climate (1) 173:17 climatic (1) 233:1 close (8) 54:9;86:20;130:11; 141:22;146:24;175:2;182:1; 224:8 closer (2) 65:4;158:8 Coalition (61) 9:9;13:7;14:8;23:16,20; 55:21;57:23;84:3;113:6; 114:3,15;118:24;119:1; 122:10,13,22;123:18;128:8; 130:3,17;134:11;135:12; 136:3;137:16;140:12;141:5; 143:22;145:6,13,21,25; 147:19;148:11;150:6,17; 156:9,18;166:23;167:14; 171:21;174:18;176:10; 177:4;181:12,13,16;182:4; 199:4;206:5;224:22;226:24; 232:1,3,8;233:15,18;236:11; 238:5;245:10;252:4;254:12 Coalitions (1) 147:2 code (1) 193:10 coin (1) 251:18 colleagues (1) 120:21 collectively (2) 81:18;88:11 collects (2) 192:15;195:23 colon (3) 65:23,24;66:2 color (2) 30:23;150:21 Colorado (29) 112:12;135:25;184:1; 186:12,16;208:1;210:11,14; 211:17,21;212:2,3,15;214:5, 14;215:12,13,15;216:1; 247:7,10,12;248:5;252:21, 21,21,25;253:1,2 color-coded (1) 194:23 colored (1) 150:20 colorful (1) 48:17 Column (15) 167:2,11,19,20;168:8,25; 169:1,16,18,25;170:5,19,21; 216:18;218:2 columns (5) 167:2;168:19,22;170:15, 18</p>
--	---	---	---

<p>combination (1) 138:11</p> <p>combined (2) 168:23;232:1</p> <p>comfortable (3) 22:2,6;177:11</p> <p>coming (7) 62:10;102:10;157:24; 192:18,20;217:1;241:16</p> <p>commencement (1) 82:4</p> <p>comment (2) 49:13;101:17</p> <p>comments (8) 120:5,13,15,20;121:3,11; 124:6;180:16</p> <p>commercial (4) 52:10,14;80:1,8</p> <p>Commissioners (1) 64:16</p> <p>Committee (2) 113:16,18</p> <p>commodity (2) 108:3,5</p> <p>common (3) 77:2;88:16;215:2</p> <p>Commonly (1) 88:14</p> <p>companies (4) 152:2;174:6;238:22; 243:15</p> <p>Company (128) 13:24;14:17,19,25;16:1; 17:1;22:11;24:14,18,22; 25:10,17;26:22;27:15;28:3; 29:13;31:12,21;32:4,8; 33:15;35:14;36:19;37:24; 39:18,24;40:10,11,24;41:12; 42:5,8;44:4;45:23;46:10,11; 47:22;50:3,6,12;51:13;52:5, 23;53:8,19,21;54:12,19; 56:7;57:14;58:5,7,8,59:13, 24;63:23;64:16;67:10,18; 68:6;70:10,17,19;71:7; 74:24;75:9,16;76:20;77:3,7, 25;78:7,8,11;79:8,13,17,24; 80:5,12,20;83:1,7,11;84:6; 85:1,4,24;86:7,10;88:22; 89:7;90:14,19;91:14;93:6, 15;95:13,17,20;96:5;98:1, 25;101:5,15,16,18;102:12, 13;103:15,18;110:4;112:21, 22;152:17;155:25;166:25; 191:25;192:6,10;193:19; 196:2;221:9;225:11;228:9; 244:15;248:10;252:4</p> <p>Company's (45) 24:10;29:16;41:4;42:23; 44:13;50:22;53:3,9;54:15; 55:10;57:4,17,22;70:14; 71:18;72:10,15;73:1,2,5,6,8, 17,21;74:8,13;75:13;76:9,11, 16;77:13;81:15;85:20;86:23;</p>	<p>87:11,22;89:21;92:6;95:7; 102:24;103:1,10;109:7; 200:18;235:3</p> <p>comparable (2) 145:5;156:4</p> <p>compare (6) 48:3;128:18;141:18; 145:23;170:22;174:24</p> <p>compared (7) 128:23;165:22;182:14; 224:4;230:13;234:11;244:14</p> <p>compares (1) 28:18</p> <p>comparing (3) 141:18;172:6;178:17</p> <p>comparison (11) 127:18;128:4,12;129:5; 140:22;141:2;150:22; 171:14;224:4;230:9;254:11</p> <p>comparisons (1) 12:13</p> <p>compelling (1) 187:9</p> <p>compile (1) 240:17</p> <p>compiled (2) 114:12;238:23</p> <p>complaints (1) 104:21</p> <p>completed (1) 115:13</p> <p>completely (3) 52:12;116:20;181:7</p> <p>complexes (1) 82:16</p> <p>compliance (1) 215:23</p> <p>complies (1) 28:19</p> <p>compliment (1) 252:11</p> <p>comply (1) 183:23</p> <p>complying (1) 183:24</p> <p>component (3) 22:12;142:22;242:3</p> <p>components (3) 142:21;215:15,18</p> <p>compromised (1) 21:8</p> <p>computation (1) 234:10</p> <p>compute (12) 127:12;151:2;161:19; 162:9,14;163:2,13;164:2; 171:19;173:14,18;175:19</p> <p>computed (14) 127:7;156:12;160:13,19; 168:24;169:3,4,18,21;171:6, 12;172:19;176:2;227:23</p> <p>computer (1) 117:6</p>	<p>computing (3) 159:24;172:5;234:6</p> <p>concern (3) 134:4;207:6,7</p> <p>concerning (1) 199:20</p> <p>concerns (3) 131:6;139:8,23</p> <p>conclude (2) 141:8;150:11</p> <p>conclusion (1) 116:17</p> <p>conclusions (3) 145:22;252:24;253:25</p> <p>conclusive (1) 192:7</p> <p>concrete (7) 18:24,25;19:3,5,5,10; 93:20</p> <p>condition (1) 66:21</p> <p>conditions (5) 84:21;119:12;173:18,18; 233:2</p> <p>conducted (2) 114:11,14</p> <p>confusing (1) 117:20</p> <p>confusion (1) 253:23</p> <p>conjunctive (11) 184:3;186:4;203:13; 205:20;212:9;225:7;226:9; 237:8;247:15;249:22;251:19</p> <p>conjunctively (1) 203:14</p> <p>connecting (1) 140:18</p> <p>connections (1) 115:16</p> <p>conserve (1) 144:5</p> <p>consider (8) 123:7;149:10;160:24; 161:3;179:16;180:17; 235:19;244:20</p> <p>consideration (1) 217:17</p> <p>considerations (1) 179:14</p> <p>considered (13) 9:25;12:5;37:7;38:4,9; 108:1;157:4;179:20;239:11, 12,13,22,24</p> <p>considering (3) 97:5;122:12;181:9</p> <p>consistent (7) 40:25;71:22;76:10; 123:22;133:3;134:1;178:15</p> <p>constantly (2) 32:19;96:20</p> <p>constitutional (1) 11:15</p>	<p>constraints (2) 229:14,15</p> <p>constructed (2) 44:17;90:22</p> <p>construction (1) 63:24</p> <p>consultant (1) 112:4</p> <p>consumed (1) 136:10</p> <p>consumptive (8) 159:3;184:24,25;185:9; 197:4,5;233:10;244:2</p> <p>contained (3) 15:23;37:2;138:20</p> <p>contents (1) 121:25</p> <p>context (8) 106:8;112:16;123:5; 148:8;177:10;237:7,8; 249:23</p> <p>continually (1) 94:19</p> <p>continue (6) 20:10;87:25;92:17;97:3; 148:20,22</p> <p>continued (6) 122:25;130:25;146:5; 147:9;148:25;187:10</p> <p>continues (2) 19:14;124:10</p> <p>continuing (1) 32:23</p> <p>continuous (2) 25:11;214:16</p> <p>continuously (3) 80:12;89:3;214:17</p> <p>Contor (1) 256:5</p> <p>Contract (7) 64:6,13;68:18;103:11,17, 21;104:6</p> <p>contracted (1) 41:22</p> <p>contractual (1) 108:13</p> <p>contribute (3) 191:20;233:2,11</p> <p>control (1) 125:2</p> <p>conversation (6) 39:21;94:10;106:4,4,16; 116:15</p> <p>conversion (4) 29:20;93:5;108:20;196:4</p> <p>conversions (5) 122:25;130:25;146:5; 147:10;196:1</p> <p>convert (1) 32:23</p> <p>converting (2) 95:16;228:7</p> <p>converts (2)</p>
---	---	---	---

<p>95:1,10 convey (2) 222:3,7 conveyance (18) 114:20;137:25;138:2,4,11; 142:22,22,25;143:2,7,7,12; 225:21,22,22;226:12; 237:19;244:7 conveys (1) 223:19 convincing (2) 124:12;180:3 copies (1) 53:7 copy (9) 15:12;55:4;65:1;116:7,8; 117:3,12,12;118:13 corn (13) 26:10;32:20,20;33:7;87:1; 88:8;105:1,23;106:11,18; 107:2,5,15 cornfields (1) 92:25 correcting (1) 43:12 correctly (1) 92:6 correlation (1) 153:12 correlations (1) 156:21 costs (1) 46:7 Cottonwood (2) 62:8,11 coulee (1) 195:12 coulees (3) 42:11;194:25;195:21 counsel (6) 45:1;46:8;59:5;69:9; 202:10;255:11 count (1) 53:22 counted (1) 241:6 counties (1) 238:13 country (2) 115:8;209:5 County (4) 35:25;49:1,2,12 couple (16) 11:6;51:7;80:15;100:18; 112:17;120:3,3;124:6;152:3; 154:21;161:4,5;191:17; 230:6;242:24;253:17 course (8) 18:19;28:2,14;51:21; 80:10;101:22;125:7;222:17 court (22) 8:4,6,10;10:7,10,13,19; 11:9,9;19:7;37:11;56:11;</p>	<p>180:2;194:3;212:6;226:24; 231:23;239:16;245:16; 247:20,23;251:1 courts (2) 9:24;12:2 cover (3) 191:13;213:3;238:13 covered (4) 92:5;97:23;213:9;230:6 covering (1) 224:10 cows (1) 32:20 cracked (1) 100:6 Crane (1) 242:8 create (1) 19:22 created (7) 47:25;86:13;150:12; 174:11;191:5;209:20;250:15 creates (1) 208:1 creating (1) 213:15 Creek (13) 16:12;42:14;61:2;62:2,8, 11,20,23;63:2;64:10;97:16; 195:17;242:8 creeks (1) 195:20 CREP (7) 49:24;50:19;51:17,23,25; 239:14,19 C-R-E-P (1) 239:19 crews (2) 17:7;19:16 criteria (4) 230:19;231:2;234:4,13 critical (1) 110:14 crop (92) 33:24;34:2;51:9,11;52:3; 88:7,8,8,14;97:6,10;107:18, 20;108:6,16,16;132:1;134:6, 12,15,22;135:6;136:24; 137:10;138:15;139:9; 143:20;150:7,15,24;151:3, 10,13,20;152:8,9,11;153:2,8, 8,13,15;154:12,16;155:4; 156:1,6,13,22;157:25; 158:20,24,25;159:2,3,3,7,25; 160:1,3,7,11,14;161:12; 163:19;164:2,3;165:23; 166:1;167:12,12,14;169:4, 19;173:14,19,24,25;175:19; 218:10,13,14,19;219:2,14; 220:11,24;227:17;243:20; 244:22;253:19;254:20 cropping (3) 32:12,14;88:4</p>	<p>crops (36) 11:24;32:18;66:21;77:3, 10,13,21;84:22;86:23;87:2,8, 17,20;88:12,15;92:20,22; 95:18;97:5;104:15,21,22; 106:18,25;107:5;108:8,9,12; 167:16;218:11;220:15; 221:25;233:10;244:1; 250:12,21 crops' (1) 106:22 cross-examination (13) 21:20;24:7;58:11;70:4; 78:22;99:18;197:11;198:1; 205:12;229:20;230:1;246:2; 247:1 cross-examine (1) 197:15 CRP (4) 49:23;50:19;51:17,23 CU (1) 185:7 cul-de-sacs (1) 39:5 culminated (1) 114:23 curbed (1) 39:4 curious (3) 55:25;182:21;231:19 curious-looking (1) 137:6 curiously (1) 127:16 current (21) 24:17,19;49:20;84:20,21; 92:9;116:1;133:1;148:7; 149:15;169:9;171:4;187:20, 23,24;190:19,20,20,23; 218:16,20 Currently (9) 32:10,10;33:1;35:8;39:20; 99:25;102:9;173:7;254:12 curtail (10) 35:12;58:8;148:24;184:5; 190:10,14;204:4;205:4; 209:7;226:11 curtailed (22) 185:3,5,7,9;204:16; 207:24;208:14,16;209:1,13; 210:24;211:5,12;216:3,4,5; 225:20;226:17;237:11,12; 249:15,18 curtailing (7) 184:17,22,24;185:13,15; 209:10;225:2 curtailment (58) 10:25;11:10;35:7,8;48:5; 85:10,17;122:16;182:14; 183:11,12,24;184:2,10,13, 15,21,22;186:4,7,8,9;187:3, 11;188:1,25;189:15,23; 190:2,6;191:11;202:13,24;</p>	<p>203:1,10,12,16,20,21; 204:21;205:22;206:3,19,22; 207:19,21;210:4;211:7,14; 216:9;225:8;226:20;240:22; 249:3,11,21;250:3,6 curtain (1) 134:2 curve (1) 243:19 curves (1) 141:12 customary (1) 148:22 cut (5) 8:8;34:10,16;90:11;188:9 cutting (2) 34:4,4 cuttings (5) 33:15;34:5,5;35:1,14 CWN (1) 169:1 cycle (1) 196:21</p> <hr/> <p style="text-align: center;">D</p> <hr/> <p>daily (5) 193:8;194:17;214:19,22; 215:2 dairies (3) 32:19;33:23;34:15 dairy (6) 32:16,17;33:18;34:2,6,22 Dam (1) 16:4 Darryll (1) 9:6 dash (1) 38:24 data (55) 15:6,9;49:10;71:22;85:25; 114:12,13;124:19,19;126:14, 14;127:8,9,13,19,19,23,23; 128:1,11,16,16;133:7; 140:15;151:14,15;152:15, 23;155:19;156:12,25;157:3; 163:21,23;168:20;174:21; 175:3;177:2;192:17;193:9, 14,18;194:17;214:12,22; 218:20,21;219:3,3,5,14; 227:19,24;233:21;239:13 database (8) 83:6,12;85:21;192:9; 193:9,14,18;194:17 dataset (5) 177:1,12,12,22,25 datasets (1) 178:18 date (23) 35:7,8;122:16;182:13; 184:10,17,22;187:11;188:1; 189:22,23;191:11;202:13, 23;203:2,10,16;210:4;</p>
--	---	---	--

213:13;240:20;249:3,6,7 dated (2) 64:16;138:21 dates (1) 183:11 day (7) 25:14;26:13;27:1,2,5; 30:11,11 days (3) 34:19;175:13;232:25 deal (2) 244:12;245:22 dealing (2) 124:18;228:25 decade (1) 80:18 decades (1) 75:14 decent (1) 77:11 decided (1) 201:18 decides (1) 148:4 decision (3) 11:7;251:3,7 decision-making (1) 125:13 decisions (5) 10:6;108:6;136:6;237:9; 251:20 declines (2) 88:11;227:8 decree (1) 103:21 decreed (4) 68:13;82:2;103:15,18 decrees (1) 82:8 dedicated (4) 19:23;64:22,23;65:18 Deep (1) 16:12 deficit (1) 94:23 define (1) 241:12 Degree (1) 232:25 degrees (1) 233:6 deleted (1) 22:25 deliver (12) 79:13;92:17;93:3,10; 101:10;137:21;138:14; 205:23,24;223:9,18;244:18 delivered (4) 66:16,17;93:25;212:22 deliveries (10) 19:13;30:10,12;47:11; 48:17;221:8,12;222:11; 233:17;234:2	delivering (13) 16:21;32:4,8,10;68:6; 110:2;138:2;143:4,17; 196:24;221:14;236:7;239:21 delivers (6) 16:1;24:14;83:3;89:7; 223:7;224:8 delivery (49) 10:12;11:1,9;19:24;21:1; 31:5,13;37:11,19;38:1; 54:15;57:15;58:6,14,15,17; 79:8,9;83:23;85:21;88:21; 89:10;93:16;113:2,6,7,8; 114:6,8,20;118:15,18,22,23; 119:1;137:14,18;138:16; 145:21;147:19;148:9; 181:12;197:1;220:4;233:19; 235:4,12,23;248:9 delving (1) 124:7 demand (49) 27:8,8,11;51:23;52:2,11, 13,16;73:6,9;74:14;75:5; 84:25;85:6;102:17;132:1; 133:20,23;137:12;138:15; 144:1;151:2,11,12;154:13; 164:4;165:23;166:2;168:24; 169:4;170:16;172:7;173:20; 175:21;176:4,17;180:8; 196:2,5;203:2;217:4;220:9, 18;221:5,23;222:5,6,10; 233:11 demands (11) 33:18;71:9;73:2,18,22; 74:8;136:24;137:23;169:19; 172:11;228:3 demonstrating (1) 252:5 demonstrative (1) 193:17 denied (2) 11:10;138:17 denominator (1) 160:10 deny (3) 12:6;74:10;107:21 Department (60) 23:6;37:7;53:8,21;59:21; 61:11;69:10;72:25;73:4; 74:12,21,23;76:20,23;80:22; 85:4,15,16,25;110:6;120:1; 126:22;127:16;132:18,22; 137:17,24;138:20,24;139:1; 140:7;147:17;148:2;149:3, 13;155:12;160:21;167:18, 21;168:8,16;169:14;171:1,2, 3,12;175:8;176:23,25;177:7, 23;180:24;192:4,8;200:5; 202:6;218:24;230:12,16; 241:15 Department's (13) 52:21;128:22;139:8,24,25; 148:7;168:20;169:5,23;	170:24;172:21;178:22; 220:17 Depending (1) 221:9 depends (8) 89:17;175:17,22;176:6; 213:12;215:4;237:18,18 depict (1) 140:12 depicting (1) 232:21 depiction (1) 142:10 depictions (1) 144:22 depicts (3) 14:24;140:14;151:1 depletion (6) 190:20;191:5;209:20; 212:21;213:4;229:11 depletions (2) 213:1,15 deposition (50) 23:17;24:1,3;25:10,16; 28:23;29:11,21;30:9;32:3; 33:13;34:8;35:23;36:4; 39:12;42:4,22;43:2;45:5,10, 22;49:22;50:2,11;51:1; 52:21;53:2,6;54:14,24;55:4, 14,17,18;56:2,21;59:8,19; 62:13;75:8;77:1;89:6,11; 90:14,17;93:4;98:8,19; 104:11;199:8 depressions (1) 195:1 derivation (1) 173:23 describe (10) 14:12;15:15;16:1;17:1; 20:5;101:2;112:17;114:10; 125:23;194:14 described (4) 90:25;126:3;149:18; 222:24 describing (1) 137:13 description (1) 63:14 design (1) 220:8 designed (2) 222:15;247:12 designing (1) 220:9 despite (1) 176:21 detail (4) 115:17;223:23;224:24; 233:22 detailed (2) 180:25;223:25 details (3) 200:2;219:11;227:2	determination (6) 122:16;138:17,19;139:10; 210:2;228:21 determinations (1) 180:8 determine (19) 9:24;66:21;131:25; 133:20;138:13;148:17; 149:4,11;183:11;184:21; 187:10;188:1;202:12,23; 203:9,16;205:21;206:4; 219:14 determined (15) 137:25;141:5;142:4;145:6, 12,20;146:16,16;174:25; 177:7;203:11;204:19; 205:25;213:8;229:6 determining (9) 133:18;173:20;191:10; 192:23;201:10;202:6; 203:16,17;218:10 detriments (1) 48:4 develop (4) 39:22;91:9;131:7;208:2 developed (7) 83:5,10;149:6,14;213:20; 215:20;252:2 developing (2) 37:7;140:8 development (8) 11:16;54:6,8,9;79:24;80:9; 82:19;113:22 development' (1) 11:14 developments (2) 52:10,14 Deviations (1) 155:10 devices (2) 19:11;93:23 devised (1) 67:5 devolving (1) 256:17 dialog (1) 249:14 difference (9) 74:19;76:10;95:25; 103:20;143:14;170:12; 182:23;195:12;235:22 differences (2) 142:16;143:11 different (33) 16:17;17:6,8;20:11,16,17; 29:24;31:25;50:13;79:7; 88:24;112:21;144:7,21; 148:5;151:13;153:23;160:8; 168:25;169:13;171:1,11; 173:13;178:13;185:18,19; 195:11;203:8;209:19; 221:10;232:4;237:2,24 differentiate (3)
--	--	--	---

192:17;201:18;242:11
differently (1)
176:24
diminishes (1)
95:2
DIRECT (15)
13:17;14:15;24:11;29:12;
39:12;40:13;42:3;59:5;
79:16;111:18;198:9,22;
201:6;246:6,10
direction (5)
132:22;146:4;173:3;193:5,
15
directly (1)
56:20
Director (51)
12:15;15:10;21:19;23:15,
21;35:3;37:1,10;38:15;
44:22;47:6;48:13;49:8,20;
51:17;56:15,22;59:1;60:4;
68:19;69:2,12;70:2;73:25;
78:16,20;99:9;107:17;
124:11,14,25;132:16;
138:23;178:25;181:14,15;
191:15;193:16;201:6;209:6,
9;211:18;215:16;216:17;
229:22;246:2,17;247:19;
248:4;254:23;255:24
directors (1)
28:17
Director's (3)
124:16;236:16,17
disagree (9)
49:11;58:21;86:11;196:7;
207:16;217:18;223:13;
236:21;246:11
disagreeing (2)
206:7;210:15
discharge (2)
95:6,8
discharging (1)
95:11
discomfort (1)
13:12
discover (1)
115:19
discussed (15)
23:25;24:2;28:23;42:4;
44:8;45:10,22;47:19;48:15;
52:20;68:21;76:19;79:23;
89:4;188:14
discussing (7)
11:4;29:6,22;41:14;101:2,
4;156:16
discussion (15)
28:25;43:14,17;60:17;
68:18;111:8;116:13;125:25;
149:19,24;156:15;169:25;
177:14;250:25;253:18
discussions (2)
133:4;191:23
disfavor (1)
243:5

disincentive (1)
131:14
disproportionate (1)
187:4
distance (1)
235:22
distribution (2)
66:23;67:4
District (4)
13:15;15:8;180:2;230:4
districts (2)
99:24;240:17
ditch (6)
14:3;16:19;27:25;97:12;
108:25;253:9
ditches (5)
93:6;95:6,7;220:4;221:15
diversion (47)
27:2,24;41:17;89:2,20;
90:4,10;93:17;97:4,8;
126:14;127:23;128:1,8,16;
129:22;135:11;137:12;
151:2,11,12,17;152:9;153:9;
154:13;164:4,4;165:22;
169:4,19;172:7;176:4;
200:18;220:24;225:5;
230:17,18,20;231:10;
233:21;235:23;236:12,14,
18;237:16;243:17;244:21
diversions (43)
14:25;15:20;20:19;48:7;
70:11,20;71:18;72:10,15,22;
73:1,5;126:6,7;128:5,9;
129:10;130:3,6,9,18,20;
131:2;133:18;134:14,23;
150:5,14;153:3;167:20,21;
168:13;174:1;175:25;214:8;
215:8;229:4;230:10;232:1,
16;233:2;243:25;251:3
divert (30)
16:4,5,16;89:19;90:5;
92:11;96:6,17,20,25;97:4;
102:13;109:7;131:11,15;
134:7,12,12;135:7,8;153:13;
155:3,3;160:6;184:7;223:8;
225:1;228:2;250:20,23
diverted (6)
93:16;152:12;164:5,9;
167:24;197:7
diverting (19)
41:4;95:2;96:21;131:4;
133:24,25;151:21;154:18;
159:4,20;160:9;165:21;
213:13;224:1;227:18;228:8,
13;231:3;245:14
diverts (2)
40:24;96:2
divide (1)
135:5
divided (16)
134:23;137:11;150:24;
153:16;154:12,17;169:1,5,
20;173:25,25;175:20,24;

220:24;223:11;227:17
division (2)
41:7;165:23
document (48)
9:10,20,23;12:7,8;14:12,
14;22:3;36:21;37:23,25;
38:8,12;45:18,19;47:22,22,
24,24;48:6,10,17,21,22;49:8,
15,16;60:20;61:10;63:4;
64:5,10,12;67:20,25;68:11;
69:15;72:13;81:5,8;125:16;
133:5;138:24;193:15,23;
194:10;231:12;252:19
documents (11)
21:24;38:17;45:17;53:14,
16;68:24,25;69:14,15;
101:16;235:14
dollar (1)
25:7
done (36)
20:12,15;39:18;40:3;
72:12;75:6;88:16;90:15;
101:19;121:21;122:19;
123:9;135:16,17,21,25,25;
136:3,15;147:7;167:6,8,9;
168:3;182:14;186:5,12;
203:23;213:19;218:4,5;
223:24;229:1;232:5;240:5;
256:5
dot (1)
190:8
dots (14)
140:18;145:2;150:16,21;
151:18,18;152:7;153:7;
154:3;162:4,22;163:4;
165:13;189:24
dotted (4)
140:22;141:18;142:3;
150:20
double (1)
88:4
double-check (1)
216:22
double-counted (1)
175:5
doubled (2)
29:16,19
down (23)
16:5;19:8;20:23;63:22;
68:14;88:3;97:6,7;102:8,8,8;
131:3;138:3;146:2;151:24;
153:5;162:3;164:25;221:14;
228:16;242:9;247:21;253:11
downloaded (2)
193:9;194:17
downward (2)
102:9;256:17
dozen (1)
119:25
Dr (2)
125:6,8
drain (3)
101:24;102:3;253:9

drains (3)
46:22;98:13;108:25
drastic (1)
182:13
draw (2)
145:22;252:23
drawn (3)
150:19;151:19;156:25
draws (1)
192:14
drier (1)
160:2
drip (1)
29:20
drive (2)
34:7;108:5
driveways (1)
36:8
drop (3)
87:21;101:6,17
dry (9)
34:17;61:2;62:2,20,23;
63:2;64:10;87:1;186:20
drylands (1)
82:18
due (7)
40:6;41:23;143:11,14;
192:18;196:9;227:9
duly (2)
13:8;111:3
duplicating (1)
79:3
during (29)
17:4,6,7;18:12,13;19:18;
36:3;52:20;66:18;67:6;80:5,
12;88:14;114:25;123:12,13;
126:6;127:10;130:9;146:13,
21;147:3;150:6;181:11;
188:10;199:5,17;220:11;
242:2
dynamic (1)
133:5

E

earlier (26)
79:7;80:14;86:2,18;88:22;
89:4;92:15;98:12;105:18;
127:11;130:25;135:5;141:6;
142:20;145:8;168:9;171:7;
172:24;180:22,23;207:12;
226:18;230:24;235:7;
241:24;250:19
early (6)
17:25;87:17;165:20;
187:8;221:22,24
easier (5)
38:17;65:15;90:9;148:21;
226:7
easily (3)
54:2;86:16;175:19
East (1)
14:4

<p>Eastern (4) 113:15,22;202:16;224:21</p> <p>easy (5) 30:21;54:2;181:23;191:1; 213:23</p> <p>economic (14) 9:6;10:25;11:12,13,16,18, 19;12:12,13;47:5,15,17,18; 48:4</p> <p>economy (1) 80:16</p> <p>edges (1) 17:9</p> <p>editorial (2) 115:20;116:20</p> <p>effect (5) 172:18;175:14;190:20; 222:18;249:17</p> <p>effectively (2) 206:9,12</p> <p>efficiencies (106) 76:9,11;91:10,14;92:4,18; 93:8,9;94:17;96:8;99:22; 122:9;123:8,17,21,22; 131:19,24,25;132:4,25; 133:14,19,19;135:5,13; 136:21;137:1,8;138:7;140:8, 9,14,19,23;141:1,13,20,20; 142:12;143:10;144:7,11,20, 21;145:1,4,12;146:2,11; 147:1,17,18;148:13;149:4,9, 10,12,17;155:14;157:22; 161:1;162:17,21;165:12,18; 169:2,6,10;171:5,19,21; 172:4,8;173:6,23,24;175:25; 176:2,3,8,24;201:17;219:19; 220:23;222:18,21,22;223:1, 1,3;225:17,18,21,22;226:15; 227:9,16,17,20,23;228:10; 243:3,23;244:7;254:11</p> <p>efficiency (106) 75:10;76:16;95:21; 101:14;105:3,5;131:1;134:3, 21,24;135:1,2,9,10;136:17, 20;137:3,5,11;138:9,9,12; 139:9,24;140:1,6,13;141:4, 12;142:17,20,22,23,24,25; 143:7,12;144:25;145:5,18, 19;146:9;147:11,14;148:6, 21;150:25;151:3,10;153:16; 154:12,17;155:10;156:1,6, 12,21;158:1,7,20,23,23; 159:2,5,21,24;160:13,16,17, 18,19;161:11,19;162:10,14; 163:14,20,25;164:2;165:8; 169:20,20,24;170:10,11; 172:22;175:21;176:16; 191:20,21;196:9;200:6; 221:1;226:12,13;243:4,8; 244:7;251:8,11,22,23;252:5; 253:19;254:6,8</p> <p>efficient (21) 75:14;90:15;94:21;</p>	<p>131:14;136:10;158:15; 187:1;196:10,23,25;197:3,6; 201:11;206:1;220:20,21; 245:3;248:2;250:16;251:12, 14</p> <p>efficiently (8) 90:23;92:20;93:1;143:17; 153:11;224:6,19;245:6</p> <p>eight (1) 126:9</p> <p>eighth (1) 59:16</p> <p>eightieth (4) 66:4,7,8,12</p> <p>either (11) 35:18;56:17;62:12;87:18; 97:13;108:24;129:16; 157:24;174:10;185:18; 186:17</p> <p>elapsed (1) 122:24</p> <p>electronic (1) 93:22</p> <p>else (5) 8:22;87:4;159:9,9;175:18</p> <p>Email (2) 117:17,22</p> <p>emails (1) 117:14</p> <p>employees (1) 148:3</p> <p>employing (1) 173:4</p> <p>enables (1) 90:22</p> <p>encompass (1) 68:12</p> <p>encourages (1) 250:20</p> <p>encouraging (1) 247:24</p> <p>End (19) 14:4;16:11;17:14;18:9; 20:22,24;31:7;79:20;98:13; 158:9;162:17;164:3;165:23; 176:1,4,17;177:21;194:21; 251:16</p> <p>endeavored (1) 126:13</p> <p>ended (4) 66:14;122:6;137:16;138:8</p> <p>ends (5) 17:19;18:20;46:21;70:24; 214:1</p> <p>Energy (2) 46:5;98:3</p> <p>engage (1) 227:2</p> <p>engaged (1) 112:4</p> <p>engineer (4) 22:11;67:8;101:17;112:11</p> <p>Engineering (3)</p>	<p>36:22;91:13;112:20</p> <p>Engineers (2) 112:8;120:21</p> <p>engineer's (1) 101:21</p> <p>enhanced (1) 207:10</p> <p>enjoins (1) 216:7</p> <p>enough (13) 71:6;84:20;86:12;88:20; 138:14,18;160:9;180:10,20; 183:15,15;213:6;245:5</p> <p>enrolled (12) 50:4,7,9,14,16,18,22; 51:23,25;239:14,18;240:9</p> <p>ensure (1) 85:16</p> <p>enter (1) 210:8</p> <p>entertain (1) 100:3</p> <p>entire (1) 112:19</p> <p>entirely (1) 243:11</p> <p>entirety (1) 70:10</p> <p>entities (1) 245:8</p> <p>entitled (4) 11:19;41:16;205:7;250:23</p> <p>entity (1) 237:24</p> <p>enumerator (1) 159:6</p> <p>envisioned (1) 68:11</p> <p>equal (1) 133:23</p> <p>equates (1) 54:7</p> <p>equation (9) 157:1;161:19,20,21;162:7, 9;164:19;169:22;173:5</p> <p>equivalent (3) 31:17;66:12;212:13</p> <p>eradicating (1) 18:7</p> <p>errata (1) 115:25</p> <p>errors (3) 115:20,20;116:19</p> <p>ESP (1) 35:4</p> <p>ESPA (4) 114:4;187:5,7;239:3</p> <p>ESPAM (1) 183:3</p> <p>especially (3) 124:24;184:4;246:3</p> <p>essentially (5) 131:11;137:17;187:13,16;</p>	<p>243:5</p> <p>establish (3) 37:19;162:13;188:1</p> <p>established (3) 132:10;235:3,11</p> <p>Estimate (4) 36:18;37:23;87:10;92:9</p> <p>estimates (2) 181:2,6</p> <p>estimation (2) 33:11;121:17</p> <p>et (4) 13:15;230:4;243:19; 253:24</p> <p>evaluate (3) 136:13;164:12;187:23</p> <p>evaluated (1) 148:14</p> <p>evaluating (2) 137:18;155:13</p> <p>evaluation (1) 182:2</p> <p>even (16) 125:8;137:3;148:16;151:4, 5,20;152:10;155:18,19; 161:12;175:2;181:9;208:15; 221:17,22;252:5</p> <p>event (1) 183:14</p> <p>events (1) 242:5</p> <p>Eventually (1) 34:18</p> <p>everybody (3) 8:13;90:10;110:19</p> <p>everybody's (1) 220:1</p> <p>everyone (5) 8:22;177:19,20;182:23; 255:22</p> <p>everyone's (1) 206:24</p> <p>everywhere (1) 212:1</p> <p>evidence (17) 10:24;12:12;23:2;48:9,11, 22;49:4,16,17;69:4,16; 81:24;124:12;125:17;180:4; 194:11;227:12</p> <p>evidentiary (1) 252:3</p> <p>evolved (1) 251:19</p> <p>exact (1) 220:6</p> <p>exactly (9) 36:24;107:24;113:25; 123:11;176:4;213:1;219:17; 231:14;250:5</p> <p>EXAMINATION (6) 13:17;100:16;111:18; 198:9;253:15;255:11</p> <p>examiner (1)</p>
--	--	--	---

<p>70:1 examining (1) 197:23 example (25) 46:4;116:22;123:16; 141:24;143:6,8,21;144:2; 151:17;152:11,19;154:1; 158:16;160:6;161:23,25; 162:18,21;165:5,6;175:11; 204:5;221:13;223:16;239:10 examples (2) 166:21;177:15 excavators (3) 17:15,21;18:2 exceeds (1) 86:9 excellent (1) 178:9 except (1) 170:5 exceptions (2) 141:12;146:19 excerpt (1) 10:6 excerpted (2) 11:6;22:25 excess (8) 19:4;43:24;44:4;85:17; 108:23,24;109:3;159:5 Exclude (2) 155:9,16 excludes (1) 165:11 excluding (1) 155:14 exclusively (1) 67:14 excuse (5) 74:21;167:8;199:10; 216:22;223:7 excused (2) 109:24;110:1 exhausted (2) 33:23;101:18 Exhibit (106) 9:3,18,21;10:2;12:8;14:11, 21;15:13,14,16;23:2,2,7; 30:3,6,8,9,14;31:24;32:2; 35:20,21;36:11,15,17,21; 37:5,18;38:24;40:20,23; 44:21,23;45:5,8,11;46:9; 47:2,12;48:10,12,16,23,25; 49:7,16,18;53:13;60:6,18; 65:11,13;69:16,17;71:11,12, 15;73:12,25;74:22;75:20,22, 24,24;77:17;81:2,23;84:8; 94:13;100:20;102:18; 104:10;115:5,24;116:1; 117:10;118:3,12,16;120:8, 12;121:5,6,9,16,25;124:2; 125:14,17,19;130:16;139:4; 149:19;184:9;193:17;194:2, 4,5,7,8,11,12;199:7;216:15;</p>	<p>232:17;240:25 exhibits (9) 14:9;21:21,22,24;23:3; 37:2;48:15;68:21;69:5 exist (3) 46:21;68:2;102:17 existed (2) 82:3;100:2 existing (1) 132:17 exists (2) 95:14;131:10 expect (6) 90:3;143:5,9;146:5;147:8; 252:6 expectation (1) 183:22 expected (4) 11:24;98:22;225:19; 237:10 expedited (1) 22:22 expense (1) 46:6 expenses (3) 98:23;102:24;103:1 experience (13) 14:18;61:21;76:21;94:23; 112:18;113:9,13;178:5,12; 196:8;207:25;224:4;237:5 experienced (1) 77:24 experiencing (1) 254:12 expert (17) 111:23;112:14;114:24; 115:2;122:7;124:23;135:13; 141:6;145:8;176:11;177:11; 181:21,22;198:14;246:5; 252:20;256:2 expert's (1) 124:18 expire (1) 16:11 explain (7) 32:4;33:20;44:23;116:19; 147:25;189:12;205:18 explained (6) 88:22;90:17,21;91:8;98:7; 211:20 explains (2) 14:16;30:10 explanation (1) 228:5 explicitly (1) 102:15 explore (1) 100:3 exposure (1) 107:25 extend (1) 26:21 extended (1)</p>	<p>25:21 extensive (3) 18:24;114:22;127:14 extent (15) 18:10;33:21;42:10;70:23; 82:3,9;88:1;123:3;132:12, 13;191:16,25;222:22; 248:24;250:12 extra (1) 117:12 extreme (1) 151:16 extremely (1) 249:22 eyeballing (1) 166:6 eye-opening (1) 129:20 eyes (1) 64:25</p> <p style="text-align: center;">F</p> <p>facilities (7) 20:17;63:24;97:23,25; 102:17;114:21;123:22 facing (1) 206:19 fact (9) 39:21;47:9;178:16; 180:15;187:7;200:13; 206:11;222:7;250:18 factor (1) 218:13 factors (2) 100:1,8 facts (5) 12:4;187:8;227:11;228:22, 24 fair (7) 20:2;35:17;71:6;80:17,19; 88:9;250:2 fairly (2) 40:25;171:24 fairness (1) 35:18 fall (12) 89:13;141:15;208:19; 221:7,17,21,22,23,25; 222:19,21;223:2 fallow (1) 49:24 fallowed (2) 50:24;178:12 fallowing (2) 178:14,14 Falls (129) 13:24;14:17,24;22:10; 23:18;24:10,14;25:20;26:22; 29:13;33:14;35:9,13,25; 36:19;37:24;39:18,23;41:12; 42:4;43:3,23;44:4,13;46:4, 10;47:22;49:1,11;52:5;53:3,</p>	<p>19:55:10;56:6;57:4,14,17, 22;58:5,6,8;59:13;62:15; 63:22;64:16;68:6;70:10; 71:7;74:7,13,24;75:9,12; 76:9,11,15;77:2,25;79:13; 80:20;81:14;83:1;84:5;85:1, 3,20,24;86:3;89:16;90:14; 91:9;95:17;98:1,2,15,20; 101:5,18;107:7;110:3;114:3; 144:2;146:20;154:21; 159:14,15,17,19;162:2,10; 166:25;172:15;175:10,11,12, 16;178:19;191:25;192:6,9; 193:19;194:19,22;195:3,6, 22;196:1,13;200:17;217:10; 220:1,2,2,8;221:13;223:6,8; 224:19;225:11,13;228:9; 235:2;244:9,15,23;248:10; 251:3,8;252:3 familiar (15) 49:23;51:8;52:21;62:6; 77:13,20;80:7,23;83:16; 104:20,21;105:19;219:23; 231:5;247:9 familiarity (2) 51:2,24 familiarize (1) 60:20 fantasy (1) 209:18 far (11) 20:22,23;38:22;103:2; 119:10;121:15;153:14; 177:2,13;210:10;215:19 farm (20) 26:12,14,16,17,19,20; 27:14,22;40:9;67:21,24; 68:2;88:20,25;92:21;93:2; 101:12;138:14;200:5;221:19 Farmer (16) 26:4,4,9,12,14;33:22; 87:16,18;92:15,23;96:14; 105:18;106:10;107:10,24; 108:15 farmers (26) 11:23;25:17,25;26:3,17, 18,22;27:2,9;32:4;33:14; 35:14;41:12;49:24;51:2,8; 67:22;82:21;89:2;105:17,22; 106:22;107:1,20;109:7; 143:18 farmers' (2) 107:18;108:5 farmer's (1) 107:7 farming (1) 107:8 farmland (4) 79:25;80:7;83:5,10 farms (9) 67:22,23,24,25;68:2; 137:22;138:1;143:18;236:7 feasible (1)</p>
--	--	---	---

28:11 fee (1) 25:3 feed (2) 32:20;33:23 feedback (4) 121:2;131:10;176:5; 250:22 feedback-loop (1) 133:17 feel (4) 43:11;202:2,5;253:22 fees (1) 24:19 fell (2) 129:17;146:21 few (16) 20:19;63:6,7;64:19;76:19; 77:23;79:5;92:3;96:11; 97:22;175:12;214:21; 229:22;232:17;240:24;246:6 fewer (2) 24:15;40:5 field (26) 14:5;19:17;26:5,6,9,10,10, 11;27:8,9;29:22;34:11,17; 37:21;41:21;51:2,3,9,10,22, 22;52:1;107:24,24;108:23; 114:18 fields (10) 17:19;29:8,24;49:24;51:7, 14,18,20;88:24;95:3 Fifth (31) 71:8,13,23;72:21;73:9; 76:12;84:9,12;121:6,12,18; 122:4;125:24;126:4;132:11; 141:1;144:11,25;145:1; 149:4;174:23;179:15,16; 182:7,11;184:8;202:11; 232:18;247:19;248:4;250:15 Figure (35) 39:9;86:4;136:9;139:4,5,7, 22;140:4;141:9;142:8,9,11; 144:9;145:22;149:25;150:8, 12,13;152:6,25;153:1; 154:19;155:22;156:2,9; 157:17;159:16;161:25; 165:2;190:9;218:19;227:15, 15;254:3,4 figures (13) 85:15;139:4,15;141:8; 152:2;154:23;156:16,17; 157:15;159:11;161:22; 174:6;253:24 file (2) 80:22;177:12 filed (4) 59:24;61:10;81:8;125:3 filing (3) 59:23;63:23;113:10 fill (3) 17:21,21;62:16 filled (1)	62:21 filling (1) 62:19 filter (1) 155:12 final (1) 240:24 finally (2) 145:17;153:6 find (7) 83:20;115:6;130:15; 158:12;188:20;199:22,24 finding (1) 236:21 findings (2) 124:11;131:8 fine (7) 10:15;22:16;56:4;57:2; 79:2;117:21;118:1 finish (2) 22:22;255:22 finished (2) 109:15;255:6 finishing (1) 29:2 fire (1) 97:18 first (34) 13:8;24:9;28:9;30:21; 31:12;34:4;63:13;64:19; 79:7;111:3;129:22;134:20; 135:13;139:6,15;150:4; 156:5;167:11;168:19,25; 190:5,6,10;193:4;196:16; 197:15;204:6,10,21,25; 205:2;208:25;228:8;252:2 firsthand (1) 80:5 first-use (1) 196:24 fit (2) 150:19;157:2 five (11) 25:2;33:15;34:5;35:1,14; 65:9;69:23;112:22;128:7; 146:14;219:16 five-eighths (8) 31:17;48:18;66:12;68:9, 16;93:13;200:19;248:21 five-eighths-inch (2) 79:9;248:9 five-eights-inch (1) 248:15 five-minute (1) 117:24 fix (4) 161:13,16;176:13;177:17 fixed (5) 161:14;163:15;164:19; 171:8;177:20 flat (2) 134:14;151:19 flatter (1)	154:4 FLETCHER (34) 9:12,16;58:22;110:13; 116:2;117:9,19;124:5; 125:15;188:22;193:25; 197:12,23,24;198:2,4;201:6, 9;205:16;246:3,22;247:5; 248:2,7,13;249:2,15;251:2; 253:5,9,18;255:2,3;256:14 Fletcher's (3) 229:20;248:18,25 flip (2) 84:9;152:4 flipping (1) 154:6 flood (12) 92:14;93:5;94:5;95:1,3,5, 10,19,22;108:20,23;109:8 flooding (1) 28:12 floor (4) 162:13;163:1,7,8 Florida (4) 242:10;253:3,4,6 flow (15) 21:12;25:11;42:18;44:7; 81:16;89:17,19;90:5;94:5; 103:24;144:4;168:13; 196:16;241:19;242:3 flowmeter (1) 214:16 flows (21) 16:8;17:23;18:22;42:2,5,9, 23;43:10;70:9;102:2;192:1, 6,9,11;193:19;194:18; 195:19;241:12,16;242:12; 253:10 fluid (1) 80:16 focus (1) 104:2 focused (1) 122:17 focusing (1) 122:6 folks (3) 27:20;28:7;102:16 follow (4) 26:7;155:15;243:19;247:4 following (2) 94:15;253:7 follows (2) 13:9;111:4 follow-up (4) 92:4;108:19;197:18;246:6 font (1) 64:24 food (1) 108:13 Foods (1) 11:8 foot (1) 66:8	footnote (1) 193:8 footnotes (2) 195:10;241:5 forced (1) 148:24 forces (1) 17:13 forecast (8) 168:1,4,9,10,11;170:18,19; 172:6 foreman (1) 19:17 forever (2) 207:4;208:11 forget (2) 124:2;227:15 forgo (5) 77:3,10;105:1;107:1,4 forks (3) 16:9;46:14;98:6 form (3) 71:25;93:20;219:4 format (1) 213:23 former (1) 34:16 formula (1) 200:6 formulations (1) 169:17 forthcoming (1) 45:3 forward (4) 13:4;99:15;130:21;246:13 found (8) 59:23;139:16;199:25; 200:1,2;226:24;227:16; 251:3 foundation (6) 37:13,19;45:2;49:7;72:6; 193:12 foundational (1) 119:18 four (1) 25:2 Fourth (3) 73:18;76:12;129:23 framework (2) 149:15;179:23 freely (1) 17:23 Friday (1) 255:22 front (7) 10:23;55:18;56:24;74:2; 100:21;210:10;241:1 fruition (1) 68:13 fulfilled (1) 203:11 full (6) 89:20,21;90:10;96:6;
--	--	--	--

165:22;204:25	genuine (2) 250:4,6	19:14;32:23;226:15	guarantee (1) 244:25
'	gets (5) 21:8;192:15;196:17; 206:5;225:24	Gray (2) 181:15;195:7	guess (25) 9:8;10:5;17:4;35:15,18; 37:2;47:5;59:15;71:25;75:7; 101:20;103:20;105:2;123:5, 13;160:23;167:19;183:10, 19;197:12;198:11;231:9,25; 240:25;244:13
'Full (2) 11:13,15	GIS (1) 84:4	Great (13) 30:25;42:21;63:10;65:8, 10;67:15;74:21;75:8;92:24; 154:16;191:19;245:4,4	guide (1) 121:25
F	given (8) 27:1;78:12;105:21; 108:15;123:8;131:7;146:5; 252:6	greater (14) 11:18,19;128:24;130:10; 159:18;160:3,4;162:11; 164:4,5;165:19;175:7;233:6, 11	gullies (1) 194:25
fully (2) 98:6;236:3	giving (3) 139:8,23;204:6	green (4) 34:1,9;52:15;162:3	guys (3) 56:11;88:2;111:6
function (1) 186:21	global (1) 125:10	greenhouse-type (1) 87:7	H
functionally (1) 212:13	goals (12) 54:15,19;55:11;57:4,8,14, 18,22;58:2,3,6,14	GREGORY (2) 111:1;112:2	half (8) 31:21;41:12,20,23,23; 46:24;67:10;119:25
fund (2) 91:13,17	goes (15) 23:11;25:6;28:8,17;70:22; 97:6,7,14;135:10;210:4; 218:10;228:15,16;241:25; 244:21	G-r-e-g-o-r-y (1) 112:2	half-inch (1) 48:18
funding (1) 91:8	Good (32) 8:7,10;24:5;28:15;59:2; 61:23;77:7;97:21;109:14; 111:12,20,21;123:5;132:21; 134:6;152:10;153:12,24; 155:17;157:2,4,20;158:7; 161:10;180:10;186:3; 192:17;198:3,4;216:25; 230:3,5	ground (8) 17:18;32:23;36:23;70:11; 101:8;109:4;132:19;219:24	half-mile (2) 66:19;67:11
furnish (2) 210:1,7	goose (1) 124:22	grounds (3) 9:17;11:10;101:11	hand (5) 13:4;54:23;60:3;110:24; 193:2
further (17) 11:13;23:9;32:25;68:17; 69:18;70:25;71:1;78:16,19; 99:7;100:12;109:11,12; 155:18,19;184:2;197:21	gosh (1) 34:14	groundwater (74) 11:17,20;21:25;35:13; 47:16;58:9;60:23;85:10,11, 19,23;91:12,17;99:7,24; 101:1;103:10;105:10; 109:13;112:24;122:12,15; 131:16;148:24;179:13,17,19, 22;180:1,8;181:3,10,17; 182:3,10;184:23,24;192:16; 196:17;197:15,20;201:24; 202:4,16,18;203:5,15,22; 208:8;211:21;212:21;214:6, 10;215:7,23;236:1,4;238:2,8, 18,21,24;239:1,7,14,18,21, 25;240:5,17,18,21;242:17; 249:3	handful (2) 116:21;199:17
furthermore (2) 12:3;88:5	governed (2) 247:10,15	groundwater-specific (1) 125:10	hang (1) 10:7
future (2) 86:9;185:21	government (1) 49:23	group (13) 99:7;105:11;109:13; 113:19;119:21;120:22; 121:12;126:1;155:21; 174:13;180:17,19;188:12	Hansen (1) 16:9
fuzzy (1) 236:24	grain (8) 26:10;88:15,20;104:25; 106:13;107:3,13,15	groups (2) 113:21;197:20	happen (4) 185:24;196:13;207:23; 226:4
G	grainfields (1) 92:25	grow (9) 17:11,11;87:12;97:1; 107:20;108:6,15;220:11; 250:12	happened (4) 80:11;86:20;109:8;209:8
gains (2) 192:18,24	Grande (1) 224:17	growing (7) 87:24;92:24;97:10; 106:11;220:15;232:24;233:6	happening (3) 107:23;208:3;245:21
gander (1) 124:22	graph (33) 14:24;15:4,7,17,23;35:24; 40:19;48:25;49:2;140:11; 142:14;144:16,16,19;153:3, 4;154:2;156:5,7,8,8;162:3; 188:7,24;189:3,5,12,16,17, 20;232:22;233:5;242:12	grown (10) 33:2;35:25;49:2,12;86:23; 87:8;97:5;108:12;167:16; 218:12	happens (5) 86:10;135:8;163:24; 185:8;196:21
gate (2) 16:23,24	graphing (1) 144:19	growth (3) 17:12;18:3;36:5	hardened (1) 52:9
gates (1) 225:25	graphs (15) 140:10,12,13;141:9;150:1, 3,4;155:8,22;156:4,20;158:6, 12;241:4,4		hardening (1) 41:23
gauge (1) 195:13	grass (2) 17:11,12		harder (1) 17:13
gauges (3) 194:24;195:11;241:3	gravity (3)		hard-surface (1) 97:9
gave (6) 40:14;180:16;182:17; 183:3;188:10;198:22			harm (3) 11:12;12:12;38:12
gears (4) 86:21;173:8;179:12; 191:13			harvested (6) 87:17,20,25;88:12;105:23; 221:25
general (7) 14:6;107:9;112:18; 114:10;123:23;172:4;241:15			hay (8) 26:10;33:15,24;34:10,16; 35:1,14;106:18
generally (15) 14:12;15:25;17:1;18:4; 20:5;22:6;25:6;26:12; 133:15,16;134:4;143:16; 178:9;220:15;221:23			hayfield (1) 92:24
generation (1) 45:24			hayfields (1)

<p>92:25 head (5) 60:2;61:18;94:20;96:2,7 head] (4) 39:10;43:22;105:20; 106:20 headgate (5) 28:13;48:16;93:21;148:4; 222:11 headgates (1) 16:17 heading (3) 84:15;168:23;197:7 headings (3) 64:19,21;168:8 heads (2) 20:18;197:22 health (3) 51:4;88:3;108:10 hear (5) 22:20;111:10;131:22; 239:16;253:5 heard (15) 37:11,12;102:11;123:2; 125:3;174:2,7,9;177:14; 180:21;191:14;193:10; 224:9;228:5;241:23 HEARING (149) 8:3,8,12,20;9:15,19;10:4,9, 11,15,17;12:16,19;13:3,11; 15:11;21:23;22:5,15,18,21; 23:4,8;24:5;36:22;37:9,22; 38:4,4,7,11;44:25;47:3,13, 21;48:2,20,21;49:5,15; 51:19;55:1;56:5,8,10,12,16, 20,23;58:11,25;59:2;60:5; 65:3,8,10;68:23;69:3,13,20, 22,25;72:4;74:2;78:17; 91:23;92:1;99:6,11,13,15; 100:14;105:9;107:21; 109:12,23;110:1,10,16,21; 111:9,12;115:9;118:1,4; 121:15,19;123:11;124:4,20; 125:7,11,16;132:15;133:3, 10;138:25;139:11,16; 144:11;179:3,7;181:12; 191:19;193:22;194:2,5,9,10; 197:10,16;198:13,13;199:19, 22;200:22;201:17,21; 205:12;206:10,20;226:23, 23;227:1,5;229:19;231:15; 236:18;242:22;243:1; 245:25;246:8,18;247:24; 252:3,10,16;253:4,7,12; 254:24;255:4,6,9,18,21; 256:11,16,21 hearings (1) 198:8 hearsay (5) 22:7;101:1;107:11,12; 110:12 heavily (1) 113:7</p>	<p>heavy (4) 104:24,25,25;105:22 held (3) 14:1;111:8;116:13 Hello (2) 70:6,7 help (5) 20:6;88:3;118:7;136:24; 202:6 helped (1) 23:22 helpful (6) 23:24;38:18;40:22;50:6; 51:13;192:21 helping (2) 21:1;113:11 helps (3) 32:3;137:5;192:17 here's (1) 94:6 Hey (1) 56:11 High (15) 16:10,14;20:13,24;21:4, 15;33:25;91:1;101:7;136:4; 158:22;160:17;164:1; 166:10;242:6 higher (14) 95:20;131:12,15;143:15; 147:10;157:21;158:8,9; 159:7;163:19,19;166:9; 233:6;244:8 highest (6) 164:24,25;165:12;220:18, 25;221:2 high-level (1) 121:22 highlight (2) 45:22;152:3 highlighted (4) 45:13,15,21;46:1 highlighting (1) 45:23 highly (1) 251:12 high-priced (1) 105:1 high-value (1) 136:5 high-water-consumptive (1) 32:18 hindcast (9) 164:12;166:15,20,24; 167:9;168:3;169:14;170:24; 171:4 historical (20) 22:10;96:24;97:14; 101:15;114:17,17;133:17; 135:19,24;136:6;146:20; 155:18;163:21,23;167:20, 21;173:24,25;174:1;175:24 historically (5) 32:25;33:3;67:25;135:7;</p>	<p>164:9 history (1) 14:19 hits (1) 16:9 home (1) 109:21 hope (1) 111:9 horribly (1) 184:3 hosted (1) 120:1 hostility (1) 147:23 hotter (1) 160:2 hottest (1) 220:14 hour (1) 69:23 hours (1) 179:4 huge (3) 102:5;129:18;224:17 huh (1) 253:4 hundreds (3) 135:23;224:18;236:13 Hydro (2) 46:14;98:6 Hydrologic (1) 113:16 Hydrology (1) 113:18 hydropower (6) 45:24;47:10;97:23;98:21; 102:12,14 hypothetical (1) 160:7</p> <hr/> <p style="text-align: center;">I</p> <hr/> <p>Idaho (19) 11:8;36:23;61:8,19; 112:12;113:14,17,17;114:3; 138:20;208:3;210:16;214:9; 215:8;235:20;237:6,7,17; 238:13 Idaho's (1) 247:15 idea (8) 33:6,8,10;87:13;132:21; 147:24;210:15;224:25 identified (10) 71:3;91:18;103:17;104:6; 119:12;122:6;171:16;195:8, 10;198:20 identifies (1) 203:4 identify (11) 20:10;28:9;91:13;109:20; 117:2;118:12,20;122:18;</p>	<p>193:3,3;195:15 idle (2) 51:3,7 idled (4) 51:14,21,22;52:1 idling (2) 51:18;77:25 IDWR (20) 121:3;127:5;128:11; 130:16,16;132:3,24;133:14; 134:20;137:14;163:17; 174:4,5,13;177:12,15,19; 180:7;182:15;194:17 IDWR's (5) 174:24;175:15;193:9,14, 18 ignoring (1) 181:7 IGWA (2) 53:7;231:20 illustrate (2) 139:7,22 illustrations (1) 149:23 imagery (1) 174:18 imagine (4) 17:10,24;18:19;160:5 immediately (2) 34:11;115:8 impact (4) 187:3,23;190:23;203:18 impacts (6) 9:6;10:25;19:22;186:14; 187:15;200:3 impeach (1) 56:18 implement (1) 20:10 implemented (1) 20:6 implementing (3) 75:17;171:18;172:17 implements (1) 169:25 implied (1) 151:25 important (9) 10:5;17:11;19:1;27:25; 85:16;110:3;136:5;218:13; 231:17 importantly (2) 114:14;169:8 impose (1) 85:16 imposing (1) 184:14 impression (1) 107:22 improve (3) 96:8;195:19;196:8 improved (2) 93:8;173:3</p>
---	---	---	---

<p>improvement (1) 142:5</p> <p>improvements (5) 91:18;131:1;133:1; 147:14;252:6</p> <p>inability (1) 104:22</p> <p>inadequate (1) 77:14</p> <p>inarticulate (1) 10:12</p> <p>incentive (6) 48:7;143:24;144:5;208:1; 250:15,19</p> <p>incentives (1) 245:7</p> <p>inception (1) 113:16</p> <p>inch (15) 31:2,6,14,17,22;32:11; 66:13;68:7;79:8;93:13,13; 200:19;236:19;248:22,22</p> <p>inches (1) 242:8</p> <p>incidental (3) 47:10;102:17;174:15</p> <p>include (4) 42:9;128:11;129:5;241:18</p> <p>included (3) 114:16;242:18;254:4</p> <p>includes (2) 99:2;175:4</p> <p>including (1) 75:17</p> <p>income (3) 46:16;47:10;102:21</p> <p>inconsistent (1) 104:7</p> <p>incorporate (2) 147:17;180:7</p> <p>incorporated (6) 44:9;121:12;175:15;180:3, 14;188:8</p> <p>incorporating (1) 139:25</p> <p>incorporation (2) 139:24;179:13</p> <p>increase (9) 24:22,25;25:2;28:24;65:1; 129:13,18;130:12;218:6</p> <p>increased (10) 32:21;74:13;76:10;130:3, 6,18,21;232:16;233:2;252:5</p> <p>increases (1) 159:4</p> <p>incurred (1) 46:7</p> <p>independently (1) 146:16</p> <p>indicates (3) 146:1,13;151:9</p> <p>indication (1) 158:13</p>	<p>indicative (1) 172:1</p> <p>indicator (1) 158:6</p> <p>individual (7) 15:18;88:23;107:6;152:2; 232:3;236:7,13</p> <p>individuals (1) 16:18</p> <p>industrial (5) 52:6,10;80:1,9;82:16</p> <p>industry (21) 32:17,17;33:18;34:2,7,23; 123:23;134:1;135:15; 149:11;201:10,16;225:5,6,9, 11,14,18;226:1,14;237:22</p> <p>inefficiencies (1) 243:24</p> <p>inefficient (4) 184:4;203:21;244:24; 249:22</p> <p>inevitably (1) 196:15</p> <p>inflates (1) 164:8</p> <p>Info (1) 193:9</p> <p>inform (1) 123:13</p> <p>informal (3) 8:24;9:14;11:2</p> <p>information (50) 22:10;44:8;63:15,16,21; 72:1,7;83:18;114:17;120:2; 126:3,21;127:7;133:7;140:6; 142:11;144:13,15,18; 152:21;160:22,25;161:3,8; 174:16;179:24;180:11,21,24, 25;181:1,2,14,16,20,22,24; 192:16,21;193:7;201:19; 204:7;213:21;218:17;219:2; 235:14;238:7,20,23;239:10</p> <p>informational (1) 194:24</p> <p>injured (4) 187:1;204:2;205:6;213:2</p> <p>injuries (1) 229:3</p> <p>injury (18) 198:18;199:5,10,11,20,23, 25;204:3,18,21;205:8; 207:14,14;209:17;210:2,23; 212:25;229:6</p> <p>input (2) 137:4;214:23</p> <p>in-season (9) 16:18;71:9;73:2,6;168:24; 170:16;172:11;203:2;204:2</p> <p>insert (1) 175:18</p> <p>inspector (1) 215:11</p> <p>installed (3)</p>	<p>19:21;90:18;102:3</p> <p>instances (2) 198:21;212:8</p> <p>instantaneous (1) 208:21</p> <p>instead (6) 128:18;134:15;170:10; 175:16;183:7;219:19</p> <p>institute (1) 200:2</p> <p>instrumented (1) 192:13</p> <p>insufficient (1) 11:20</p> <p>intended (3) 66:20;67:12;133:5</p> <p>intensive (1) 40:9</p> <p>intent (1) 106:3</p> <p>intention (1) 132:16</p> <p>intentional (1) 127:21</p> <p>interest (6) 21:3;22:20;23:24;75:10; 98:25;206:24</p> <p>interested (1) 207:8</p> <p>interesting (2) 128:15;146:3</p> <p>interests (1) 66:25</p> <p>interject (1) 133:25</p> <p>internet (2) 49:9;115:15</p> <p>interpretation (1) 124:19</p> <p>intersect (2) 195:1,2</p> <p>intimately (3) 83:16;105:19;107:10</p> <p>into (74) 14:4,6;16:8,10;21:22; 22:23;23:2;32:17,25;33:22; 38:8;40:22;42:17,20;44:9; 48:9,11,22;49:3,16,17;61:7; 63:11;65:19;68:12;69:3,16; 70:12;75:18;79:25;89:25; 94:5,7;95:6;96:23,23;97:11, 13,14,15;100:1;101:8,12; 102:6;107:4;108:24,25; 109:4;121:12;124:7;125:17; 134:5,17,18;135:6;136:22; 140:1;143:13;144:6;154:18; 157:24;158:3;164:3;167:7; 179:14;180:8;194:11; 195:20;210:8;214:24; 218:10;225:25;241:25; 250:19</p> <p>introduce (1) 8:5</p>	<p>introduced (1) 9:18</p> <p>inventory (1) 19:3</p> <p>investigation (1) 114:15</p> <p>investigations (2) 114:11;125:22</p> <p>invitation (1) 119:24</p> <p>involved (10) 107:8;113:5,7;114:7,21; 119:20,23;126:16,17;198:10</p> <p>involvement (1) 118:14</p> <p>involving (3) 136:5;151:10;251:1</p> <p>irrelevant (1) 47:12</p> <p>irrigate (8) 34:17;51:2,8;88:2;92:10; 95:18;106:11,14</p> <p>irrigated (47) 25:14;27:5;29:8,14;36:9; 37:21;40:6,9;41:11,20; 49:22;52:2;53:9,23;69:10; 78:4,12;79:20;80:8;83:2; 84:4,22,25;85:4,5;86:3,7; 87:25;97:7;105:4;122:11; 173:9,11,16,22;174:3,14,17, 25;175:15;176:25;177:13, 21,24;178:17;179:21;218:11</p> <p>irrigates (2) 108:22;109:2</p> <p>irrigating (11) 17:18;52:24;53:4,20; 54:12;58:7;87:21;178:10; 217:15,16;221:20</p> <p>Irrigation (65) 13:15;17:5,7;19:14;26:13; 29:21;31:7;41:5;44:5;47:11; 48:8;50:23;62:15,21,22,24; 66:18;80:21;81:15,19;82:9, 12;84:16,21;88:10;89:3; 92:14;94:6;95:3,5;102:17; 105:19;108:23;109:9; 114:21;123:25;135:16,19; 136:14;141:14;146:6; 159:25;167:15,24;178:6; 181:8;199:5;212:16,18; 220:7;224:5,7,16,20;225:17; 226:15,16;230:4;233:23; 234:2;237:19;241:19;242:2, 11;244:2</p> <p>irrigators (1) 66:23</p> <p>issue (12) 12:2,3;28:12,13;47:5, 19;82:1;117:9;147:9;196:14; 223:4</p> <p>issued (6) 11:8;82:8;120:5;201:8; 209:9;231:6</p>
---	--	---	---

<p>issues (1) 122:5</p> <p>ITCH (1) 113:17</p> <p>item (1) 22:7</p> <p>items (1) 79:6</p>	<p>keep (13) 31:11;50:3,12,16;52:5; 53:19;117:7;131:12;169:14; 175:18;180:20;186:13;211:7</p> <p>keeping (1) 93:24</p> <p>keeps (2) 83:12;206:2</p> <p>Kent (1) 230:6</p> <p>key (1) 190:11</p> <p>kind (41) 14:16;17:3;30:15;34:3,15; 40:11;49:10;54:9;98:22; 123:22;126:15;127:20; 129:13,19;133:17,21;134:11, 14,23;135:24;137:1;142:14; 143:5,24;144:6;146:11,17; 149:15;152:3;164:11; 165:16;174:15;176:5; 178:20;182:21;190:7; 194:25;215:4,5;216:10; 230:13</p> <p>kinds (6) 90:4;124:25;131:1;136:13, 18;205:25</p> <p>Kinyon (2) 20:22;90:21</p> <p>KLAHN (69) 60:8,10,13;111:15,16,19, 22;116:3,5,9,11,14,15; 117:24;118:6,7,10;120:18, 20;124:1,20,21;125:9,14,18, 20,21;132:9,15,16;133:9,10, 13;138:23;139:3,12,13,17; 178:25;179:9,10,11;188:23, 24;191:15,21,23;193:16,24; 194:1,4,8,13;197:10;205:10; 231:12;246:14,15;252:14, 25;253:3,10,12,13,16; 254:22;255:8,16;256:9</p> <p>Klahn's (2) 197:17,17</p> <p>knew (1) 248:14</p> <p>knowable (2) 225:23,25</p> <p>knowing (1) 50:24</p> <p>knowledge (3) 179:25;215:7;249:4</p> <p>known (1) 195:14</p> <p>kosher (1) 214:1</p>	<p>laid (2) 51:7;219:24</p> <p>Lake (8) 16:6;59:4,7,14;62:21;63:2; 64:3;244:14</p> <p>land (9) 27:20;39:22;64:15,16; 77:25;82:20;83:7,12;174:25</p> <p>lands (10) 51:24;78:11;137:23; 175:15;176:25;178:11,13, 17;238:8,9</p> <p>landscaping (1) 97:1</p> <p>language (1) 23:10</p> <p>large (20) 18:13;67:13;86:12;90:25; 97:17;123:24,24;137:12; 143:2;178:5;220:7;224:5; 226:1,5;235:20;236:10,12; 237:17;243:15;245:2</p> <p>largely (3) 115:12;178:10;213:19</p> <p>larger (6) 15:22;16:16;20:5;143:6; 159:7,7</p> <p>large-scale (1) 91:3</p> <p>largest (1) 220:10</p> <p>last (40) 13:22;24:24,25;29:17; 32:14,16;34:4,4;39:22; 59:16;65:6;67:2,3,17;68:21; 71:19;75:14;80:15,18;92:8; 105:2;119:11;122:24; 123:19;147:3;154:20; 156:15,16;175:12;183:9; 191:4;199:2;207:4;209:20; 232:17;240:20;242:7; 249:25;250:7;252:2</p> <p>lastly (1) 250:25</p> <p>late (3) 8:25;228:18;255:25</p> <p>later (9) 34:20;44:3;130:9;134:6, 17;143:13;186:2;211:15; 229:12</p> <p>lateral (2) 220:3;221:15</p> <p>laterals (2) 70:24;138:3</p> <p>latest (1) 180:18</p> <p>lava (1) 224:9</p> <p>law (1) 247:10</p> <p>lawyer (2) 183:21;235:13</p> <p>lawyers (1)</p>	<p>239:23</p> <p>lay (2) 45:1;193:12</p> <p>leads (1) 245:2</p> <p>leak (1) 18:1</p> <p>least (23) 8:18,22;9:2,5,22;10:20; 11:5;12:9;18:13;23:8,10; 41:15;48:6;72:4;140:14; 146:14;157:5;160:18;161:9; 173:2;182:18;187:18;219:4</p> <p>leave (3) 8:14;23:11;68:18</p> <p>leaves (2) 70:19;89:25</p> <p>leaving (1) 256:5</p> <p>left (4) 115:13;153:5;162:3,7</p> <p>legal (1) 63:13</p> <p>legally (3) 235:3,11;239:23</p> <p>length (2) 176:22;191:24</p> <p>less (41) 14:16;72:15,19;89:5; 92:11;93:5;94:5;95:11,23; 106:12;107:15;109:3;127:1, 3;128:2,3;131:4;135:7; 143:18;146:1;151:21;155:3, 4;164:15,17;165:10;169:23; 170:6,9;175:3;196:9,10,24; 197:1,6;221:23;222:10,10, 11;245:3;252:14</p> <p>less-than-efficient (1) 148:25</p> <p>letter (1) 53:7</p> <p>letters (1) 69:8</p> <p>lettuce (2) 29:22,25</p> <p>level (20) 17:25;21:1,4,16;80:13; 95:21;141:25,25;143:15; 146:15;148:21;157:21; 158:11,23;160:17;165:11; 224:24;226:22;243:16,18</p> <p>levels (1) 148:12</p> <p>licensed (1) 112:11</p> <p>lifetime (1) 77:7</p> <p>liked (5) 119:9;121:21;122:20; 123:9;147:4</p> <p>likely (5) 26:9;61:6;83:15;89:22,22</p> <p>Likewise (1)</p>
J			
<p>January (2) 64:17;138:21</p> <p>Jay (17) 12:24;13:6,21;14:15; 15:15,25;22:2;79:1,3;81:1,6; 84:12;99:12;123:2;148:4; 226:3;241:24</p> <p>J-a-y (1) 13:21</p> <p>Jennifer (5) 184:21;188:7;189:20; 193:11;204:7</p> <p>Jennifer's (1) 188:14</p> <p>job (1) 29:2</p> <p>JOHNS (1) 256:12</p> <p>Johnson (1) 45:11</p> <p>joined (1) 145:2</p> <p>joint (1) 81:9</p> <p>judge (8) 123:20;125:3;201:3,8; 231:7;248:8,14,21</p> <p>judicial (6) 124:7,17;132:10;138:24; 201:8;231:6</p> <p>judicially (1) 186:17</p> <p>July (8) 89:25;90:3;153:5;158:17; 201:4,7;220:14;222:16</p> <p>June (12) 18:4,6;90:2;153:5;157:13; 162:1,2,10;166:5,6;220:14; 222:16</p> <p>junior (13) 11:11,21;35:13;148:24; 188:25;190:22;191:6; 202:17,18,19;209:21; 210:24;229:4</p> <p>juniors (8) 183:14,22;186:13;213:15; 225:2,19;226:17;237:11</p> <p>Justice (1) 38:5</p>	<p>key (1) 190:11</p> <p>kind (41) 14:16;17:3;30:15;34:3,15; 40:11;49:10;54:9;98:22; 123:22;126:15;127:20; 129:13,19;133:17,21;134:11, 14,23;135:24;137:1;142:14; 143:5,24;144:6;146:11,17; 149:15;152:3;164:11; 165:16;174:15;176:5; 178:20;182:21;190:7; 194:25;215:4,5;216:10; 230:13</p> <p>kinds (6) 90:4;124:25;131:1;136:13, 18;205:25</p> <p>Kinyon (2) 20:22;90:21</p> <p>KLAHN (69) 60:8,10,13;111:15,16,19, 22;116:3,5,9,11,14,15; 117:24;118:6,7,10;120:18, 20;124:1,20,21;125:9,14,18, 20,21;132:9,15,16;133:9,10, 13;138:23;139:3,12,13,17; 178:25;179:9,10,11;188:23, 24;191:15,21,23;193:16,24; 194:1,4,8,13;197:10;205:10; 231:12;246:14,15;252:14, 25;253:3,10,12,13,16; 254:22;255:8,16;256:9</p> <p>Klahn's (2) 197:17,17</p> <p>knew (1) 248:14</p> <p>knowable (2) 225:23,25</p> <p>knowing (1) 50:24</p> <p>knowledge (3) 179:25;215:7;249:4</p> <p>known (1) 195:14</p> <p>kosher (1) 214:1</p>	<p>law (1) 247:10</p> <p>lawyer (2) 183:21;235:13</p> <p>lawyers (1)</p>	
K	L		
	<p>labeled (2) 189:21;216:18</p> <p>lack (1) 77:4</p>		

<p>198:6 limit (3) 70:21;100:9;226:5 limitations (1) 100:7 limited (3) 198:21;212:7;233:14 Line (77) 16:8,10,10,14,14,14;20:13, 13,16,24;46:14;53:11;55:8; 57:1,6,7;60:24;61:3;63:5,6; 77:20;91:1,21;94:14;98:2,5; 101:7,9,11;104:16,20; 140:17,22;141:3,18,19; 142:3;145:3,9,10,24,24; 146:1,1,9,9,12;147:5,12,15; 150:20,21,23,23;151:6,19, 23;153:14,15,17,24;154:4,9; 155:6;162:6,7,9;163:1,2,9; 189:18,18,19;190:3,13,13; 209:11 lines (8) 22:9;55:12;63:22;71:17; 100:25;154:8;195:7;254:9 lining (8) 18:15;20:11,12;75:17; 90:25;91:3;123:1;146:6 list (4) 20:9;69:7;118:17;255:23 listed (4) 62:2;193:8;241:5,8 listened (1) 252:19 listening (1) 8:17 litigation (1) 224:15 little (30) 19:8;26:9;65:4;68:5; 72:19,20;79:5;80:15;90:13; 115:14;127:24;132:20; 134:5,17,19;143:13;147:13, 15;169:9,13;170:11;171:11; 173:8;178:3;181:25;182:6; 184:6;190:7;219:19;236:24 live (1) 195:16 load (1) 222:16 local (1) 42:9 location (6) 42:19;205:9;212:22,24; 229:7;244:13 lock (1) 16:23 lockstep (1) 160:13 lodge (2) 37:2;132:7 lodged (6) 9:3,10,13,20;12:8,9 logistically (1)</p>	<p>23:5 long (12) 34:13,15;143:2,2;183:6; 203:24;224:15,18,18; 239:12;240:16;246:18 longer (4) 65:4;126:6;187:19;199:16 long-term (3) 127:8;128:17;178:6 look (46) 14:7,11;28:9;29:3;30:2,20; 31:25;36:11;38:19;39:3; 45:16;56:3,25;60:22;65:18; 76:15;81:22;94:17;115:17; 120:8,12;121:5;123:6,14; 128:15;130:2;133:25;134:2; 139:2;144:9;151:4;152:1; 154:2;161:25;165:2;172:10; 177:20;190:12,19;204:15; 217:23;223:21,22,25;233:7; 254:1 looked (15) 59:20;62:5;68:3;69:9; 115:17;122:14,21,24;127:6, 10;138:6;224:20,23;240:1; 245:12 looking (30) 32:19;36:24;40:4,23; 43:15;72:7;91:11;114:21; 115:24;122:8,9,10;127:9; 137:19;141:18;150:8;154:7; 157:15;168:4;189:3,4; 211:15;230:10,17,23; 235:15;236:11;240:25; 255:14,23 looks (4) 8:21;62:7;63:13;120:15 loop (5) 131:10;146:24;176:5; 182:1;250:22 loose (1) 40:21 lose (1) 96:9 losing (1) 196:20 loss (5) 11:19;47:7;142:22;143:4,7 losses (6) 137:25;138:4;196:3; 225:23;237:19;243:24 lost (2) 61:16,24 lot (34) 18:11,17;19:18;52:17; 80:16;88:1;90:18;114:16; 134:10,11;135:16,17,25; 136:6;141:15;143:6;147:23; 152:15;154:10,10;155:1,3,4; 157:19;158:21;159:14; 175:12;219:11;230:9; 235:25;242:9;247:6;252:14, 23</p>	<p>loud (1) 111:10 Low (17) 16:10,14;20:13;46:14; 98:2,5;101:9,11;137:8,11; 141:13;158:13;162:17,19; 195:22;208:18;222:22 Lower (27) 46:14;98:2,5;135:10; 148:21;160:19;162:15,17; 175:19,20,21,23;176:2,2,3,7, 8;194:21;196:11;221:5; 222:5,20;223:3,5;227:24,25; 228:11 Lunch (2) 110:20,22 ly (1) 141:23</p> <p style="text-align: center;">M</p> <p>machine (1) 10:10 Magic (4) 27:18;83:15,16,21 magnitude (1) 74:25 Main (8) 16:8,14;18:5,22;20:16; 32:15;122:17;195:21 mainly (2) 189:17;195:14 maintain (8) 17:2,12;83:2,11;84:3; 93:15;108:9;148:25 maintains (2) 83:7;192:9 maintenance (8) 16:25;17:3,5;19:16,16,17, 24;24:19 major (1) 113:20 majority (1) 185:20 makes (3) 46:23;124:15;143:1 making (8) 17:22;18:2;55:15;93:11; 171:22;196:23;237:2,3 malls (1) 52:6 man (1) 107:22 manage (7) 21:11,11,12;65:4;90:9,22; 226:8 managed (4) 227:10,13;228:1,22 management (9) 67:7;90:8;143:15;212:9; 228:25;237:8;247:16; 249:22;251:19 manager (1)</p>	<p>14:6 managers (1) 199:8 managing (1) 110:2 manner (1) 70:13 many (21) 17:20;33:4;34:25;40:5; 44:12;52:14,23;53:3;54:12; 58:7;75:17;97:16;155:2; 161:5,9,10;171:10;223:6,8; 224:25;241:3 map (4) 62:5,10;64:2;139:15 margin (2) 172:5,7 mark (6) 60:14,16;193:22;194:2,4,5 marked (19) 9:3;12:8;15:12,14,16; 21:24;40:14,20;48:10,21; 49:16;60:18;65:11;68:25; 69:15;118:3;125:16;194:7, 10 market (3) 11:23;32:24;34:7 match (1) 213:1 matches (1) 167:3 material (1) 22:24 materials (1) 130:15 math (9) 41:7;72:12;75:6;126:16; 185:2;218:4,5,6;228:10 Matt (1) 42:23 matter (12) 8:23;11:5;110:5;111:24; 112:5,14;114:1;115:3; 134:12;172:4;240:21;249:25 matters (5) 10:23;12:21;118:15,18,22 Max (1) 117:15 maxes (1) 90:2 maximizing (1) 207:10 maximum (1) 145:15 may (33) 13:11;31:14,16,20;37:8; 48:6;54:25;66:21;87:7;91:6; 93:1;99:9;107:23;108:5,15; 133:11;136:22;147:13; 153:5;154:2;178:6;190:5; 205:18;209:7;214:22,25; 221:13;238:15,18,19; 239:23;250:21;252:25</p>
---	--	---	--

<p>maybe (26) 8:14;59:16;65:9;68:4; 81:1;109:3;116:19;117:25; 127:13;129:1;149:24;152:3; 166:8;173:1,1;177:15; 196:20;209:7;210:4,13; 214:21;215:18;234:19; 236:4;240:12;244:11</p> <p>McCain (1) 256:2</p> <p>McHugh (2) 8:18,19</p> <p>mean (60) 11:17;23:5;61:18;74:18; 78:7;107:12;121:20;128:6; 130:24;152:23;159:12; 165:6,15;168:4;170:8;176:7; 177:2,9,17,18;178:3,4; 180:11,21,23;183:2,17,19, 20;192:11;202:15;203:3; 207:25;208:4,12;209:4; 214:15,21;215:18;216:23; 218:18,18;221:10,19;224:12, 14;225:16;228:18;229:14; 230:24;232:4;235:21; 239:20;240:3;241:23; 243:18;244:19;245:22; 250:5;252:16</p> <p>meant (2) 118:25;217:9</p> <p>measurable (1) 93:21</p> <p>measure (5) 16:18,22;67:12;214:7,11</p> <p>measured (5) 66:19;194:18;214:14; 215:21;241:17</p> <p>measurement (3) 28:13;194:20;214:13</p> <p>measurements (1) 195:5</p> <p>measures (4) 70:17,21,25;71:3</p> <p>measuring (5) 19:11;67:10;93:23; 214:17;225:14</p> <p>meat (1) 46:16</p> <p>mechanism (5) 86:6;184:3;186:4;203:12; 215:20</p> <p>mechanisms (2) 213:20;221:10</p> <p>meet (20) 33:17;67:8;70:8;94:22,22; 136:24;137:23;138:15; 143:20;157:25;183:15; 197:5;207:1;221:11;228:2; 230:19;231:10;234:3;250:3, 6</p> <p>meeting (4) 27:2;188:11;244:1,21</p> <p>meetings (3)</p>	<p>119:25,25;120:3</p> <p>Melanson (5) 201:3,8;248:8,14,21</p> <p>member (7) 113:15;130:3,17;135:13; 143:22;155:25;232:3</p> <p>members (47) 84:3;114:16;122:10,13,22; 134:3,11;140:12,19;141:6, 22;142:13;144:21,24;145:7, 13,25;146:14;148:11;150:6, 18;156:9,10,18;161:9; 166:23;167:14;171:22; 173:19,21;174:18,19;177:4; 178:8;181:13,16,19,19; 199:9;224:22;227:21;232:1; 233:15,18;234:1;245:11; 252:4</p> <p>members' (2) 128:8;240:18</p> <p>memo (2) 120:24;121:1</p> <p>memory (1) 56:17</p> <p>mention (1) 159:10</p> <p>mentioned (11) 59:4,10,11;86:25;90:18; 92:15;96:13;108:18;114:5; 130:24;198:9</p> <p>meshed (1) 24:2</p> <p>met (1) 166:2</p> <p>meter (2) 16:22;214:16</p> <p>meters (5) 93:15,20,22;214:7;215:10</p> <p>method (7) 133:22;137:9,13,15; 146:18;172:3;214:5</p> <p>methodologies (2) 136:8;230:19</p> <p>methodology (112) 11:2;12:4,5;37:7;38:2; 44:9;52:22;53:10;55:11; 57:4;58:3,15;69:11;71:8,13, 23;72:7,21;73:9,18,22;74:1, 7,15;75:3;76:12;84:9,12,24; 85:5;121:6,12,18;122:4,11, 14;125:24;126:4;128:22; 129:23;131:23;132:4,8,12, 14;133:4,15,22;137:7;140:1, 9,20,24;141:1;144:11,25; 145:2;148:13;149:4;150:25; 151:23,25;155:5;161:2,15; 162:16;163:24;165:8;169:2, 11;170:22;171:4;172:22; 173:3,6,12,16;174:24;175:2, 7,14;177:8,23;179:14,15,16, 20;182:7,11,20,25;184:8; 200:3,11;202:11;229:2,13, 15;231:6;232:5,11,18;234:3,</p>	<p>8,9;247:19;248:4;250:15,20, 24;252:2;253:23</p> <p>methods (3) 119:5;136:13;139:25</p> <p>Mexico (2) 112:12;224:15</p> <p>microphone (1) 12:17</p> <p>microphones (2) 8:13;111:7</p> <p>mid-1980s (3) 189:1;190:22;209:10</p> <p>mid-'80s (5) 190:14;191:6;204:5; 205:5;209:22</p> <p>mid-April (2) 89:7,10</p> <p>midday (2) 256:5,13</p> <p>middle (2) 18:4;141:14</p> <p>mid-October (2) 89:8,10</p> <p>mid-season (1) 220:25</p> <p>midsummer (1) 223:2</p> <p>Midway (5) 44:18;46:5,14;98:2,5</p> <p>might (16) 10:13;15:10;23:9;60:4; 121:25;125:3;128:15;129:4; 152:4,9;166:7;189:3;191:14; 240:23;242:18;253:22</p> <p>miles (10) 16:15;54:7;86:19;143:3; 220:3,3;221:14;223:20; 224:11,18</p> <p>million (18) 40:25;41:5;72:19;96:1,6; 98:20;103:7;127:2;184:23, 25;185:7,8,13,15,17,22; 223:11;228:13</p> <p>Milner (7) 16:4;42:24;152:11;154:7; 165:3,3,5</p> <p>mind (7) 21:6;79:1;92:23;108:21; 139:21;169:15;205:20</p> <p>miner's (6) 31:2,6,13,17,22;66:13</p> <p>Minidoka (6) 175:9;185:1,6;190:2,21; 217:9</p> <p>minimize (2) 71:5;202:3</p> <p>minimum (2) 145:15;200:11</p> <p>minus (2) 170:18;178:21</p> <p>minute (8) 10:14;116:12;117:1; 151:5;165:2;202:9;216:13;</p>	<p>255:18</p> <p>minutes (8) 65:9;69:22;76:19;128:7; 179:1,5;246:22;252:15</p> <p>mischaracterized (1) 205:14</p> <p>mischaracterizes (1) 205:10</p> <p>misclassified (1) 177:16</p> <p>misleading (1) 137:1</p> <p>mismatch (1) 155:2</p> <p>missed (2) 116:22;209:9</p> <p>mistake (1) 217:13</p> <p>misunderstand (1) 234:19</p> <p>misunderstanding (1) 234:20</p> <p>misunderstood (3) 91:7;106:9;129:2</p> <p>mitigate (15) 183:14,14,15;186:14; 187:15;203:2,6;205:21,23; 207:21,23;208:2;211:10,11; 250:8</p> <p>mitigated (1) 211:15</p> <p>mitigating (3) 203:18;209:23;211:8</p> <p>mitigation (35) 85:11;131:17;148:19; 183:21;186:23;191:8;202:3, 7;203:19;204:10;205:25; 206:5,8,13,23,25;208:5,9; 209:12;210:8,12;211:1,2,3,4; 212:4,12,17;213:6;226:20; 240:1,9;250:5,10,11</p> <p>mix (2) 218:13;219:14</p> <p>mixture (1) 165:3</p> <p>model (12) 35:4;113:23;183:3,4,6,12; 184:14;186:11;187:4; 203:15;208:20;214:5</p> <p>modeling (23) 112:24;113:13,16;122:15; 136:12;182:8,10,20,24,25; 186:9;187:10,23;188:2; 191:2,9;192:17,22;202:23; 203:1,3,4,9</p> <p>modest (3) 171:18,20;172:18</p> <p>modifications (1) 172:21</p> <p>modified (1) 161:2</p> <p>moisture (4) 136:24;157:25;166:2;</p>
--	--	--	--

<p>244:4 moment (4) 60:19;81:4;105:21;231:15 Monday (1) 26:4 money (2) 49:24;136:6 monitor (3) 42:15,19;54:4 monitored (1) 42:16 month (17) 18:6;30:11,11;153:3,23; 159:1;164:1;165:7,17,21,22, 22;167:15;169:6;173:15,17, 18 monthlies (1) 141:21 monthly (41) 131:25;136:16,21;137:1,4; 140:8,14,19,23,25;141:11; 142:12;143:9;149:17;151:4; 152:23;153:2,2,8,9;155:14; 156:17,20;161:11;163:15; 167:6,7,12;169:3,5,10,19,23; 183:3,4,5;214:18,25;215:2,8; 220:23 months (16) 137:9;140:15;153:23,24; 155:2,10;159:18;161:10; 162:11;163:18;165:3,20; 170:6;220:14;221:4;223:5 moratorium (5) 187:5,6,7,12,17 more (124) 14:16;21:9;33:1;37:14,21; 39:14;40:9;43:10;46:10,11, 22,23;53:25;64:20,25;68:9; 72:6,20;75:13;77:7,23; 80:16;85:4,6;86:4;89:5; 90:15,23;92:20;93:1;94:7, 17,20,20,21,21;95:18;97:22; 106:14,24;107:3,4,4,15; 115:17;119:18;122:19; 129:15;131:5,11,14,15,16; 132:18;135:7,8;141:2;143:3, 4,17,19;144:1,13;149:12; 151:8,8,21;158:2,11,15; 159:20;161:18;164:8,13; 165:24;169:9;170:8;177:2; 179:1;187:1;190:25;195:24; 196:11,23,24,25;197:3,5; 206:1,1,2;210:4;215:2;217:3, 12,15,15;218:16;219:15; 223:22,25;224:1,3,3,5,18; 226:7;227:23;228:2,9,18; 233:9,10;239:13;242:25; 244:19;245:1,6;247:25; 248:2;250:16,20,22,23; 252:24 morning (14) 8:4,7,11,19,23;12:22; 16:20;59:5,10;97:19;102:11;</p>	<p>109:21;195:25;255:15 Morocco (1) 115:10 Moss (4) 18:3,7,7;21:11 most (26) 21:6;36:4;44:16,18;52:14; 89:2;96:17,17,19;98:12; 134:9;145:25;146:12,13; 155:2;181:19;187:18;208:3, 4;212:2;213:21;214:9;216:2, 23;220:19,21 motion (4) 10:23;11:5;12:7;107:21 move (16) 22:13;33:25;58:20,25; 68:20;83:23;92:21;93:1; 105:23;107:17;131:19; 154:19;155:21;166:14; 176:9;181:25 moved (6) 14:3,4,5;32:17,19;88:6 moves (2) 27:22;54:4 moving (5) 26:5;28:10;59:1;136:23; 152:16 mowing (2) 17:8,8 much (54) 16:3;17:16;18:10;32:8; 37:21;43:18;46:20;47:15; 61:16;65:4;68:5;92:13; 93:16;95:2;96:13;97:4; 101:7;106:24;109:3,8; 126:18;136:9;144:5;151:7,8; 152:13;154:4;157:14; 159:18;177:21,21;178:10; 181:17;184:5,13,15;187:19; 190:10,17;192:6,18;193:20; 196:22;197:3;204:17; 206:23;213:9,12,13;223:4; 228:9;236:20;242:9;245:21 multiple (5) 17:15;20:16;29:24;94:11; 251:24 multiplied (1) 175:24 Murtaugh (11) 16:6;59:4,7,14;61:17; 62:16,19,21;63:2;64:3; 244:14 must (7) 78:7,7,8;84:20;106:9; 108:9;148:12 myself (3) 72:12;135:16;245:13 N name (5) 8:6;13:20,21,22;111:25 names (1)</p>	<p>27:21 natural (8) 81:16;89:17,19;90:4; 103:24;168:12;241:22; 242:12 nature (4) 51:10;142:17,17;191:25 near (13) 33:25;84:15;119:16; 141:25;158:24;185:1; 187:21;190:1,21;194:21,22; 220:19;244:16 nearly (3) 54:1;86:19,19 necessarily (5) 76:13;87:23;143:10; 208:10;239:8 necessary (5) 48:8;148:15,15;206:25; 207:1 need (90) 8:13;10:13;12:21;18:21, 21;21:9;26:8;27:12,13; 36:11;37:5;40:21;52:3;74:5; 90:6;97:20;134:6,7,13,16,22; 135:6;137:11;139:9;143:25; 150:7,15,24;151:3,10,13,20; 152:1,9,12;153:2,8,8,13,15; 154:12,17;155:4;156:1,7,13, 22;157:25;158:20,25;159:3, 5,21;160:1,3,8,11,14;161:12; 163:19;164:2,3;167:12,13; 169:5,19;173:14,25,25; 175:20;177:24;186:18,23; 190:14;197:3;218:10,14,19; 220:10,24;224:1,4;227:17; 229:17;243:16;244:22; 247:21;250:6;253:19;254:20 needed (6) 24:24;25:1;183:10;200:2; 202:8;234:14 needing (1) 88:15 needs (10) 27:2;34:6;94:8,22;131:12; 143:20;173:19;213:1;250:4, 12 neighborhood (1) 223:15 neighbors' (2) 67:22,23 net (2) 84:22;186:25 new (26) 8:4;18:15,15;19:12;20:17; 27:22,23,24;83:19;100:1,3; 112:12;122:8;126:15;127:8, 18,23,23,25;128:24;129:8; 171:6;183:1;187:5,13; 224:15 News (2) 62:9;173:10 next (20)</p>	<p>12:24;16:24;26:14,20; 48:14,24;70:1;110:23;142:7, 14;152:20,21;154:1,2; 155:21;167:19;168:22; 170:15;210:3;255:12 Nice (2) 70:8;198:5 night (1) 242:7 ninth (3) 59:17;65:20,23 nods (4) 39:10;43:22;105:20; 106:20 none (3) 194:10;208:25;209:12 nonetheless (1) 107:25 nonirrigated (1) 36:25 Non-Irrigated (2) 36:18;37:24 nonirrigation (3) 17:6;18:12,14 noon (1) 109:15 normally (2) 22:18;112:15 North (6) 39:9;146:19;154:21; 159:14;217:24,25 Nos (1) 81:11 note (7) 127:6;141:17;146:8; 149:21;154:20;156:24; 159:13 notes (2) 188:20;241:10 nothing's (1) 181:5 notice (4) 30:14;74:1;138:24;139:2 noticeably (2) 107:14,15 noticed (2) 32:13,15 November (9) 81:25;82:5;168:1,3,9,11; 170:16,19;188:11 now-unsealed (1) 55:4 number (27) 8:16;29:17;44:6,14;51:9; 53:20,22;72:14;82:12;83:2; 85:6;86:12;101:14;114:6; 122:5;135:9;140:24;141:22; 145:6;149:7;171:8,9;183:19; 223:12;233:6;236:1;254:7 numbered (1) 59:23 numbers (24) 74:4,16,19;80:21,24;90:4;</p>
--	--	--	---

117:10,10;123:18;127:10; 139:13;144:17,19;170:23, 23;171:1;174:3,10;185:11, 12,12;216:18,24;242:18 numerator (5) 159:22,23;160:4,9,11 numerous (1) 113:10	108:25;109:3;111:8;116:11, 13,16;117:13;141:15; 153:14,25;196:22;222:9; 241:16,25;256:16,18 offer (21) 8:24;9:1,4,8,14,20,22; 10:2;11:2;21:21;47:2;48:15, 18;49:3,13;69:12;124:1; 132:17;193:13,16;194:8 offered (3) 8:24;172:21;246:5 office (1) 27:18 OFFICER (131) 8:3,8,12,20;9:15,19;10:4,9, 11,15,17;12:16,19;13:3,11; 15:11;21:23;22:5,15,18; 23:4,8;24:5;37:9,22;38:4,7, 11;44:25;47:3,13,21;48:2, 20;49:5,15;51:19;55:1;56:5, 8,10,12,16,20,23;58:11,25; 59:2;60:5;65:3,8,10;68:23; 69:3,13,20,22,25;72:4;74:2; 78:17;91:23;92:1;99:6,11, 13,15;100:14;105:9;107:21; 109:12,23;110:1,10,16,21; 111:9,12;118:1,4,124:4,20; 125:7,11,16;132:15;133:3, 10;138:25;139:11,16;179:3, 7;191:19;193:22;194:2,5,9; 197:10,16;198:14;199:19, 22;200:22;201:17,21; 205:12;226:23;227:2,5; 229:19;231:15;242:22; 243:1;245:25;246:8,18; 247:24;252:10,16;253:4,7, 12;254:24;255:4,6,9,18,21; 256:11,16 officers' (1) 236:18 official (1) 74:1 offseason (2) 19:18;20:3 often (5) 24:22;33:22,24;34:4; 214:14 old (8) 101:16;117:3;127:19; 128:23;129:17;148:6; 173:10;177:4 Olsen (1) 9:6 once (5) 19:4;37:5;88:19;106:12,23 one (108) 8:14,22;10:7,14,23;16:22; 22:7;25:18;26:3,5,9,19,19, 23;27:8,9,22;28:10;44:18; 48:24;56:18,19;58:18;60:11; 64:21;66:3,6,8,11,19;67:10; 68:2;69:6,6;75:23;83:18,23; 91:5,6;92:23,24;99:9;	101:11,16;105:2;107:20; 108:6,16,19;110:5;113:20; 116:23;117:13;119:18; 123:9;124:9;126:1;133:16; 137:13;140:11;141:2,10; 142:13;145:23;148:7;149:8; 152:6,11,13,20;154:1;156:5; 157:9;160:23;161:16; 162:18;164:13;165:13; 169:16;179:18,19;180:1,15, 18;181:8,17;182:18;183:9,9, 19;188:9;189:4,13,23; 191:23;195:24;198:17; 202:10;205:8;207:7;209:11; 216:23;227:25;235:21; 238:15;240:20;254:14; 255:25 one-quarter (1) 165:12 ones (10) 19:12;77:8;113:4;157:10; 191:6,7,8;209:22;241:7,8 on-farm (10) 92:18;93:8;138:7,11; 142:23;147:11;196:9;197:6; 226:13;237:19 ongoing (4) 19:14;20:9;37:11,19 only (26) 10:3;41:23;102:14;105:5; 128:1;138:2;143:25;152:22; 154:17;159:21;165:21; 172:16;190:13;204:4,9; 205:4,7;207:13;209:25; 212:16;217:13;241:7;250:3, 11;255:25;256:7 on-system (1) 93:9 onto (2) 95:2;101:11 open (6) 140:18;148:4;216:14; 235:20,24;237:17 open-canal (1) 222:25 opening (1) 132:12 operate (21) 14:16;95:21;142:1;143:19, 23;146:15;148:12,20,21; 164:24;186:19;207:24; 224:5,18;225:19;226:2,4,7; 243:9,14,16 operated (2) 166:11;245:6 operates (3) 25:11;153:11;221:9 operating (23) 21:5,9,9,16;141:25; 143:16;146:22;157:21; 158:8,22;159:20;160:17; 171:22;172:5;187:18;206:9, 12;210:19;226:16,22;	237:10;251:21,23 operation (9) 101:21;110:17;123:24; 134:3;138:8;146:7;149:1; 225:16;245:3 Operational (3) 70:23;158:7;244:24 operationalize (2) 147:25;148:8 operations (18) 19:25;20:7;47:10;75:13, 18;105:3;114:25;122:22; 123:8,19;136:13;146:20,21; 147:2;158:14;197:6;224:16; 226:25 opinion (21) 36:4;38:17;39:17,20;50:8, 18,20;158:14;172:20; 199:12,18,20;200:4,10,17; 202:22;205:6;207:13;217:2; 218:16;235:11 opinions (7) 37:20;112:5;119:2; 123:14;179:12;198:14,17 opportunities (1) 91:11 opportunity (4) 101:6;115:14;133:24; 246:14 opposed (2) 35:5;237:3 opposite (1) 146:4 orange (5) 154:3;189:18;190:3; 195:4;241:21 order (100) 11:2,4;12:4,5;30:15;38:2; 44:9;51:3;53:10;69:11;71:8, 13,23;72:7,21;73:18,22;74:1, 7,15;75:3;76:12;84:9,12; 94:22;97:19;121:6,7,13,18, 19;122:4,5;125:24;126:4; 129:23;131:23;132:4,11; 133:5,15;138:4,21;139:1; 140:1,9,20,24;141:1;144:4, 11;145:2;148:25;149:5; 150:25;151:23,25;155:5; 161:15;165:8;169:2,11; 170:22;172:23;173:12; 174:24;175:15;176:3; 177:23;179:15,16;182:7,11; 183:21;184:8,10;185:5; 186:20;187:17;200:12; 201:7;202:11,12;203:11; 209:6,9;229:2;231:2,5,6; 232:18;236:16,22,24; 240:22;247:19;248:4; 250:15;252:2;253:23 ordering (1) 221:11 orders (3) 39:25;121:16;167:3
--	--	--	---

<p>Order's (1) 234:4</p> <p>ordinarily (1) 23:23</p> <p>original (8) 114:7,24;127:12,17; 137:16;145:21;181:11,22</p> <p>originally (1) 102:4</p> <p>others (5) 95:7;142:2;224:23; 226:11;244:10</p> <p>other's (1) 213:25</p> <p>otherwise (3) 82:18;117:19;196:18</p> <p>ought (6) 11:5;27:10;147:15; 151:24;155:6;180:13</p> <p>out (59) 14:3;16:4,8,17,21,23;17:7, 17,22;18:2,7,21;19:18; 22:25;30:15;39:8;40:22; 44:14;82:20;83:8,10,13; 84:1;88:14;90:2;95:8,11; 102:10;106:7;107:23;115:8; 125:6;127:2;128:20;136:9, 23;137:5;141:13;144:24; 148:3;152:7,17;156:20; 157:24;166:21;171:16; 178:13;190:9;195:23;207:6; 209:5;210:10;216:6;218:19; 219:24;223:12;225:24,25; 251:19</p> <p>Outlier (1) 155:10</p> <p>outliers (1) 155:15</p> <p>outset (1) 234:15</p> <p>outside (2) 246:4,9</p> <p>outstanding (2) 24:12;79:17</p> <p>over (35) 16:15,17;18:25;21:19; 32:14,15;53:8;60:2;69:10; 70:22;71:19;74:14;82:24; 102:2;103:19;112:15,15; 113:23;123:6,19;129:13; 146:19;162:7;166:2;170:15; 192:12;198:8;199:16; 217:21;218:3;223:19;230:7; 234:7;236:6,13</p> <p>overall (6) 172:2;178:14;197:1; 215:15;218:9;222:5</p> <p>overcome (1) 137:2</p> <p>overdiverting (1) 221:4</p> <p>overlap (1) 79:5</p>	<p>overlapped (1) 238:9</p> <p>overrule (3) 38:11;125:11;133:8</p> <p>Overruled (5) 125:13;201:3;205:13; 231:18;248:14</p> <p>oversee (1) 113:21</p> <p>oversight (1) 127:21</p> <p>overturn (1) 19:3</p> <p>overview (1) 122:1</p> <p>own (8) 26:14;27:14;46:15;98:6, 16;174:14,21;248:25</p> <p>owned (2) 46:20;98:10</p> <p>owner (2) 98:1,17</p> <p>owners (1) 27:22</p> <p>ownership (2) 27:16;98:25</p> <p>owns (1) 27:19</p>	<p>38:5,16;42:12,18;63:23; 67:6;74:3;80:2;81:23;94:9; 101:14;127:11;138:16; 147:18;148:17;151:25; 158:1;165:21;168:17; 169:25;173:20;207:9;208:4; 214:22;216:2;235:15; 236:23;243:13;244:11,23; 254:20</p> <p>partial (1) 165:22</p> <p>partially (1) 168:10</p> <p>participants (1) 8:16</p> <p>participated (2) 113:1;198:7</p> <p>particular (6) 12:1;61:22;175:6;178:8; 230:16;242:3</p> <p>particularly (5) 136:23;165:17;178:5; 191:10;193:1</p> <p>parties (5) 98:10;109:20;112:13; 114:13;209:12</p> <p>partly (1) 246:3</p> <p>partners (2) 46:15;98:6</p> <p>part-owner (1) 98:1</p> <p>parts (5) 27:10;65:19;94:11; 196:12;220:4</p> <p>party (3) 67:5;204:3;208:8</p> <p>passages (1) 11:7</p> <p>past (6) 76:24;166:11;167:3; 223:24;227:10;228:3</p> <p>pasted (1) 188:9</p> <p>path (2) 96:24;97:14</p> <p>patios (1) 36:8</p> <p>patrons (2) 95:18;110:3</p> <p>patterns (2) 32:12,14</p> <p>PATTERSON (2) 255:17,24</p> <p>pay (3) 49:24;229:10,11</p> <p>PDF (1) 38:25</p> <p>PE (1) 111:1</p> <p>peak (4) 141:14;220:9;222:15; 223:1</p>	<p>peeled (1) 222:9</p> <p>peer (1) 113:22</p> <p>pen (1) 110:17</p> <p>penalties (1) 183:24</p> <p>pending (1) 110:5</p> <p>people (4) 65:1;117:2;206:10;209:10</p> <p>per (21) 24:19;32:11;39:23;40:1; 41:6;43:24;44:1,5;67:25; 71:19;79:9,10,21;92:13; 127:1;200:19;223:7,8; 224:25;236:19;237:16</p> <p>per-acre (2) 79:14;237:21</p> <p>per-acre-feet (1) 237:21</p> <p>percent (39) 29:9,14;35:25;46:24;49:3; 53:25;54:1;78:4;82:16,18; 86:4,15,18;92:7,7;127:3; 138:5,10;162:23,24;163:3; 165:14,14,19,24;166:8,8,10, 12;204:9,12,13,17,20;205:2, 7;207:14;213:3;243:23</p> <p>percentage (10) 28:24;29:7,19;43:3,16; 87:10;185:3;204:11,15,16</p> <p>percentile (10) 164:22,23;165:11;166:7, 12,13;170:7,10;173:5;243:5</p> <p>perfect (4) 66:15;160:12;181:4,5</p> <p>performed (1) 213:11</p> <p>period (12) 67:6;88:13;90:3;114:25; 127:11;129:23;130:9,10; 145:7;199:16;214:25;234:7</p> <p>periods (2) 72:2;183:4</p> <p>perishing (4) 77:13,21;104:16,21</p> <p>permanent (1) 174:10</p> <p>permanently (3) 210:24;211:5,12</p> <p>per-share (1) 79:14</p> <p>person (1) 70:8</p> <p>personal (2) 14:18;252:17</p> <p>personally (1) 80:7</p> <p>perspective (2) 12:1;107:9</p> <p>perspectives (1)</p>
P			
	<p>page (73) 14:21;15:23;22:8;30:21; 31:12;38:20,24,24;39:11; 40:5,13;55:5,6;57:1;61:13; 63:4,12,12,13,14,18;64:2,5, 19,20;71:15,23;73:8,16; 74:22;75:25;76:1,2;77:18; 81:22;84:10,15;94:14; 100:23;104:10,13;117:10; 118:21;119:15,17;124:10,10, 13,15;139:11,13,15;140:10; 142:7;144:14;149:19,21,24; 159:15;188:4;189:5,9,11,13; 201:8;216:14,20,21,22; 227:7;230:8;232:19;234:24</p> <p>pages (4) 115:25;156:19;211:18; 238:3</p> <p>paper (2) 63:18;117:3</p> <p>paperwork (2) 28:8,9</p> <p>paragraph (4) 81:24;84:18;124:13;235:6</p> <p>parameters (1) 28:19</p> <p>parking (1) 52:17</p> <p>parks (1) 52:6</p> <p>part (36) 9:11;10:4;12:3,10;37:6;</p>		

<p>108:17 Pete (2) 117:16;118:7 petewood@idwr (1) 117:23 petition (1) 201:7 physically (1) 28:10 pick (6) 128:24;152:17;156:20; 157:9;165:10,13 picked (3) 34:18;166:21;171:16 picking (2) 243:12,12 pie (1) 43:9 piece (8) 64:23;142:25;164:13; 181:17;226:12,13;230:16; 236:25 pieces (1) 72:1 pink (2) 145:11,11 piping (1) 235:25 place (21) 27:3,24;28:3,5,11;66:15, 19;67:11;86:6;174:10;176:1; 206:9;209:12;211:22; 212:15,17,18,22;214:4; 216:9,25 places (8) 63:6,7;186:13,15;192:14, 14;194:18;212:2 Plain (4) 113:23;202:17,18;224:21 plan (24) 206:9,13,17;207:2,4,5; 208:4,6,9;209:12;210:8,12, 20;211:17,22;212:12,16,23; 213:7,9;215:16;244:2,22; 248:5 planned (3) 91:4,5,6 plans (24) 186:17,18;208:2,10,14,15, 16,17,18;212:3,4,5,6,10,11, 15;213:3,11;214:18,19; 215:24;240:1,9;247:7 plant (6) 44:16,18;77:10;104:22,23; 107:3 planted (2) 33:4;78:8 planting (3) 77:3,10;107:2 plants (7) 44:12;46:15,20;98:9,15, 24;99:2 play (1)</p>	<p>61:7 plays (1) 144:6 please (28) 8:5;12:18;13:4,19;14:11, 22;15:16;19:8;23:12;38:21; 57:6;71:15;73:13,16;75:20; 77:17;100:23;104:19; 110:24;112:1;142:9;144:9; 188:5;193:24;194:15; 232:10;247:21;252:17 plot (3) 150:16,16;157:23 plots (1) 150:11 plotted (6) 142:13;150:5,15,23; 155:20,20 plotting (5) 153:2,7,9;156:5,11 plowed (1) 132:19 plugged (1) 127:21 plus (2) 168:13;178:21 pm (1) 256:21 Pocatello (5) 111:2,23;114:2;206:11; 231:20 point (21) 18:8;27:23;29:7;37:12; 83:23;91:16;93:16,17; 106:14;110:15;124:2,15; 139:14;152:7;155:17;204:1; 211:14;226:5;235:22,23; 236:12 Pointe (1) 39:9 points (4) 150:20;166:8;194:20; 236:13 policy (3) 28:6,19,20 Pond (2) 20:22;90:21 ponds (2) 17:19;97:17 pool (2) 203:17;210:5 poor (1) 158:5 poorly (1) 251:14 population (1) 48:25 portion (4) 23:7;86:22;87:14;110:7 portions (1) 124:8 position (5) 14:5,6;112:7;202:2;209:25</p>	<p>positions (1) 14:1 positive (1) 131:9 possible (9) 10:25;21:13,14;22:23; 33:20;48:4;70:23;75:21; 94:16 post (2) 126:19;194:2 potato (2) 32:24;107:2 potatoes (5) 26:11;33:2,9;87:1;106:12 potential (3) 122:12;161:5;238:8 potentially (4) 123:15;149:12;158:7; 185:25 power (11) 44:12,16,18;45:13,16; 46:11,14,15;98:2,5;102:16 practice (3) 34:13,16;244:25 Practices (7) 84:16,21;105:19;107:8,19; 114:22;237:20 precipitation (1) 242:5 predecessor (1) 113:19 predict (2) 133:23;208:21 predicted (3) 75:4;76:20,23 predicting (4) 73:2;74:24;151:11,12 predictor (3) 134:7;154:13,16 prefer (1) 191:16 preferable (1) 176:25 preference (3) 149:7,8;172:25 prefiled (10) 22:13;23:21;24:1;71:11, 14;79:23;86:22;94:4,12; 96:16 preirrigating (1) 17:18 preliminary (2) 8:23;45:1 prepare (4) 15:4;121:19;149:2;164:11 prepared (10) 23:21;36:22;67:20;68:11; 102:21;118:17;119:13; 150:1;193:5,15 present (10) 28:11,12,13,24;30:17; 112:5,7,21;151:14;174:13 presentation (1)</p>	<p>12:11 presentations (1) 188:10 presented (6) 8:24;71:23;118:11;120:2; 174:21;175:8 presents (1) 187:8 president (1) 112:8 pressure (2) 21:13;188:22 presumes (1) 134:6 pretrial (1) 15:23 pretty (15) 16:3;18:10;61:22;64:24; 114:14;126:14;128:4; 130:11;141:22;153:11,12, 24;159:16;178:18;235:23 prevent (1) 162:15 prevents (2) 186:25;212:25 previous (6) 126:5;141:23;144:14; 166:3;219:5,7 previously (13) 12:2;37:25;38:9;40:6; 46:9;121:9;141:5;142:4; 145:20;146:16,18;182:14; 206:1 Price (1) 64:21 prices (3) 11:24;108:3,5 primarily (2) 89:17;115:20 primary (1) 87:2 principle (1) 202:15 print (2) 117:13,18 printed (1) 116:10 prior (26) 10:6;20:9;25:2,3;37:2; 82:3;112:22;113:1,17; 118:17;119:3,6,13;137:14; 171:8,9;187:17,20,24; 190:24;202:19;230:14; 233:7;249:12;251:1,3 priority (7) 104:3;122:16;182:13; 184:17;189:22;202:23; 240:20 privately (1) 46:20 probably (16) 11:4;46:17;61:23;80:17; 88:6;100:8;157:21;158:8;</p>
--	---	---	--

<p>159:20;173:10;179:1;221:4; 234:18;236:6,20;242:19 problem (7) 118:9;127:4;149:9; 176:21;181:7;209:24;249:18 problems (2) 253:8,9 procedure (3) 135:22;155:15;182:12 proceeding (12) 38:1,6,47;9:55;11:57;5:18; 91:22,25;198:23;209:13; 216:10;220:2 proceedings (1) 201:23 process (6) 23:22;119:21;131:6,11; 132:18;196:19 produce (9) 35:8;46:23;184:6,15,25; 189:1,13,14;190:16 produced (6) 30:22,22;46:9;115:2; 188:8;190:1 producers (2) 46:13;108:13 producing (1) 11:18 product (2) 58:4;142:23 production (6) 82:20;83:6,8,11,13;84:1 professional (8) 112:7,9,11;121:17;134:24; 157:10;158:14;196:6 profit (1) 47:7 program (6) 18:24;27:18;61:20;83:15, 16,21 programs (6) 49:23;50:4,7,9,22;240:8 progression (1) 173:5 project (94) 18:13;19:15;25:14;26:9, 15;27:20;29:17;30:1;32:25; 33:2;42:17;52:7;54:5;59:22; 76:9,11,16;77:14;78:8;88:4; 90:25;91:10;105:4;107:15; 122:9;123:17;131:19,24,25; 132:3,25;133:14,18,19; 134:21;138:9;139:9,24,25; 140:5,8,12,14,19;141:20; 142:12,16,20,24;144:10,20, 20;145:5,5,19;147:1,18; 148:13;149:4;153:16; 154:12;155:9;156:1,6,11,21; 158:19;161:11,19;169:2,5, 10,24;170:10,11;172:3,22; 173:23,24;176:16,23; 219:18;220:20;221:1,20; 223:1;224:17;227:9;235:16,</p>	<p>19;238:8;243:3;244:14; 253:19 projects (18) 17:20;18:15,16;20:6,9,12, 12,25;46:18;75:17;91:3,4; 102:12;201:11;219:21; 227:12;238:12;239:7 promises (1) 256:12 proof (8) 8:24;9:1,9,14,21,22;10:2; 11:3 proper (2) 11:4;205:20 properly (1) 227:13 prophecy (1) 133:21 proposal (3) 126:2;164:12;173:4 propose (10) 149:3;160:20,21;161:7,16; 162:8,12,25;164:20;234:20 proposed (3) 161:4;169:18;243:3 proposing (4) 133:1;148:12;164:18,21 prospect (1) 35:15 protect (3) 66:25;229:3;234:14 protects (1) 215:20 prove (1) 39:18 profit (1) 186:19 provide (15) 21:1,15;53:21;85:25; 113:22;174:8;177:19; 183:12;204:2;206:4;211:1,2, 3,4;229:16 provided (10) 53:7;126:22;127:5,7; 130:16;140:6;174:6,16; 238:4;250:6 provides (3) 175:16;186:1;187:6 providing (2) 21:4;183:13 provision (1) 122:14 provisional (1) 127:13 provisions (1) 11:15 prudently (2) 21:5,17 pull (3) 40:22;71:11;73:12 pulling (2) 38:17;143:15 pump (4)</p>	<p>137:21;186:24;210:11; 250:9 pumped (1) 190:24 pumper (1) 202:4 pumpers (1) 201:24 pumping (10) 180:25;181:13;184:5; 186:13;187:20,24;188:25; 190:24;209:15;216:7 purple (4) 151:18,18;162:22;163:4 purports (1) 9:5 purpose (5) 9:16;48:3,5;56:16;203:17 purposes (17) 9:13;10:3;53:9;102:14; 135:19;140:22,22;150:22; 165:8;171:15;192:23; 193:20;194:24;200:13; 217:4;254:10,14 pursued (1) 250:3 push (3) 17:13;179:1;222:14 put (22) 14:14;15:17;19:19;20:11, 16,17;21:12;28:14;30:15; 34:19;106:25;111:23;128:7; 140:21;141:2;155:13;176:7; 191:16;225:10;237:1;239:9; 251:19 putting (3) 18:6;47:11;100:1</p>	<p>141:15;142:3;155:1;182:22; 183:8;198:20;230:7;236:24 quote (3) 22:12;94:6;235:3 quoted (3) 22:11,24;110:9</p> <hr/> <p style="text-align: center;">R</p> <hr/> <p>rained (1) 242:6 rains (1) 242:9 raise (2) 13:4;110:24 range (6) 83:20;145:12,15;146:11; 178:20;243:13 Rangen (1) 113:8 ranging (2) 162:21,23 rate (14) 30:12;40:25;41:17;89:2, 20,21;144:3;200:18;225:5; 235:4,12;236:18;237:16; 244:25 rates (1) 79:8 rather (9) 15:19;155:25;164:20; 170:5;171:3;173:6;177:12; 245:1;246:15 reach (16) 185:2,4,4,7,16;190:2,11, 21;192:18,24;204:14; 208:21;209:17;210:22; 211:6,13 reached (1) 187:21 reaches (3) 185:18,19;186:1 reaching (1) 192:19 react (1) 191:18 reaction (1) 196:6 read (25) 24:1;55:8,22;56:13,20; 57:1,6;64:11;65:2,15;66:3,6, 15;67:2,3,17;74:16;84:12, 23;104:16,19;139:20;199:3; 231:8;235:14 read] (1) 66:8 readily (1) 219:4 reading (4) 55:14,17;56:1;217:19 reads (1) 81:24 ready (2)</p>
Q			
		<p>qualification (2) 22:24;23:1 qualified (2) 107:19;235:10 qualifier (1) 202:21 qualify (1) 129:6 quality (3) 17:20;18:15;20:17 quantified (3) 73:19,23;74:8 quantities (1) 66:20 quarter (1) 179:5 query (1) 241:3 quick (7) 34:2;99:10,14,16;109:18; 246:21;254:1 quite (11) 33:24;77:5;114:22;</p>	

<p>89:13,14 real (10) 34:5;62:5;99:14;137:9; 138:1;202:8;204:1;207:1; 219:3;254:1 reality (1) 219:19 realize (3) 46:12;47:16;73:24 realized (1) 204:10 realizes (1) 47:18 realizing (1) 45:24 really (24) 9:17;17:3;18:22;19:1,1; 20:2;23:25;34:2;86:10; 92:16;107:6;124:18;131:14; 133:24;168:9;174:7;192:7; 195:21;202:8;211:15; 215:19;229:9,10;251:18 realm (2) 124:7,24 reason (20) 32:1;74:10;86:13;136:20; 138:16;144:7;147:11;158:2; 159:5,21;165:18;171:10; 183:2;184:14;217:25;221:3; 239:11,23;244:6,23 reasonable (35) 35:12,16;58:8;71:9;73:2,6; 134:1;138:8;141:4;144:10; 145:18,19;146:9,15;147:1, 17;148:14;149:9,12;158:11; 161:2;168:24;170:16; 172:11;181:2,6;225:5,21; 226:25;237:17;243:11; 251:1,4,21,23 reasonableness (7) 123:7,20;149:10;163:22; 172:25;225:16;226:10 reasonably (5) 158:22;160:17;177:6; 212:19;237:10 reasoning (1) 182:22 reasons (6) 147:13;178:12;182:17,18; 183:19;203:20 rebuild (1) 51:3 rebuttal (1) 191:16 recalculate (1) 176:15 recall (35) 25:4;28:25;35:21;39:15; 42:25;43:5;44:19;45:7; 49:25;51:5,6;52:25;53:11; 54:16,20;57:19;59:7;62:17; 129:10;147:23;174:23; 184:20;192:2;199:12,21;</p>	<p>200:23;201:17;231:14; 233:16;236:2;247:6;251:7, 10;253:20;254:17 recapture (1) 101:9 receive (11) 46:18,24;47:10;48:8; 49:15;94:23;98:16;101:23; 121:2;205:7;207:13 received (17) 10:2;23:3;48:11,12,22,23; 49:17,18;69:3,5,16,17; 119:24;125:17,19;194:11,12 receiving (2) 41:24;52:18 recent (10) 44:16,18;84:20;86:14; 88:3;102:7;216:23;227:23; 233:3;239:13 recess (2) 117:24;179:8 recharge (16) 16:6,6;59:12,17,22,25; 60:23;61:6,7,9,11,20,23; 64:10;103:10;244:10 recharging (2) 59:14;62:14 recognize (3) 30:6;53:14;81:14 recognizing (1) 22:21 recollection (2) 126:18;238:22 recommendation (5) 120:4,9,14,23;216:16 recommendations (2) 81:11;176:23 recommended (1) 236:18 recommending (3) 147:16;215:16;216:17 recompute (2) 127:22;175:25 recomputed (2) 126:8;128:17 reconsider (2) 10:24;12:7 reconsideration (1) 11:6 record (40) 9:3,11;10:14,17;12:9,10; 13:20;14:13;15:16;21:22; 22:23;37:3,6,18;38:5,8,13, 16;47:12;60:17;74:3;83:1,2; 110:13,21;111:8;112:1; 116:11,13,14,16;118:5,10; 120:7;149:22;179:7;193:21; 248:24;256:16,18 recording (3) 8:3;69:25;179:8 records (4) 47:23;59:20;114:17;123:6 record's (1)</p>	<p>248:20 Recross (3) 105:10;255:1,2 RECROSS-EXAMINATION (1) 105:14 red (4) 145:9,10,23;146:1 redact (1) 110:6 redacting (1) 23:6 redeliver (1) 94:24 redirect (7) 22:17;46:9;99:8;100:16, 19;246:1;253:15 redirected (1) 102:6 redline (1) 117:5 redo (1) 132:12 red-shaded (1) 146:10 reduce (7) 27:11;70:18,20;71:1; 88:20;176:15;218:8 reduced (7) 31:21;102:9;104:22; 233:17,19;234:1,1 reduces (1) 41:11 refer (1) 155:11 reference (6) 86:21,22;124:16;140:21; 169:21;252:23 referenced (2) 11:15;204:8 references (2) 125:12;252:20 referred (3) 35:4;52:22;120:10 referring (5) 84:19;94:12;199:15; 245:8;249:11 refers (1) 204:12 reflect (4) 27:23;83:7;234:14;248:25 reflected (3) 121:16;163:21;167:17 reflection (2) 160:15,16 reflective (1) 232:2 reflects (5) 83:19;145:15;157:23; 160:25;168:2 refresh (2) 56:17;245:13 regarding (5) 9:6;10:25;12:12;53:9;</p>	<p>173:4 regardless (1) 158:24 regards (1) 102:1 registrations (1) 112:10 regression (12) 161:19,20,21;162:6,9; 163:1,2,11,13;164:18; 169:22;243:4 regular (1) 19:2 regulate (1) 93:16 regulations (1) 66:22 rehab (1) 19:11 rehabilitate (2) 10:21;51:10 reimbursement (1) 46:5 rejected (7) 200:8,15;201:13,20;227:5; 231:22;248:14 related (12) 23:10;32:16;58:16; 118:23;142:17;145:10; 176:22;179:12;189:13; 193:18;238:7;248:8 relating (3) 13:8;81:24;111:3 relation (3) 126:14;134:15;181:14 relationship (9) 151:12;155:5;157:5,14,20; 159:17;160:12;161:11,13 relative (2) 50:15;82:15 relatively (7) 80:11;141:13;151:19; 164:1;184:6;210:20;213:23 release (1) 109:19 relevance (3) 47:5;91:22;99:21 reliable (4) 132:19;177:3;178:22; 208:17 reliably (1) 186:22 reliance (1) 177:10 relook (1) 122:21 reluctant (1) 22:19 rely (1) 101:20 relying (2) 177:11;207:21 remember (19)</p>
--	--	---	--

54:21;80:2;94:9,10; 103:12;117:8;133:12; 139:19;174:20;199:3;200:1, 25;219:16;235:16;238:11; 248:11,13;251:5;254:5 remind (3) 23:12;159:23;173:11 reminding (1) 56:24 remote (4) 174:19;175:3,4;219:2 remotely (2) 8:17;120:2 removed (2) 82:12;83:5 rendered (3) 198:14;200:4,10 renegotiated (1) 208:11 rentals (1) 167:23 repairs (1) 18:2 repeat (2) 239:17;245:16 repeatable (1) 178:23 repetitious (1) 37:4 replace (6) 19:1,2,11;210:5;247:19; 248:4 replacement (7) 186:16,18;212:23;213:9; 215:24;247:7;248:5 replacing (1) 116:16 replete (1) 252:20 report (41) 9:5;111:23;114:24;115:2, 12,21;118:12;119:15;122:7; 124:9,23;125:6,8;135:13; 139:14;141:7;145:8;149:2; 181:22;188:5;189:6,12; 198:15;204:9;211:18;215:8; 216:14;217:2,11,19;225:10, 13;227:7;230:8;233:13; 234:25;235:17;238:2;246:5; 252:20;254:6 reported (2) 96:17;167:14 reporter (14) 8:4,6,10;10:7,10,13,19; 19:7;56:11;194:3;239:16; 245:16;247:20,23 reporting (3) 213:21;214:17,20 reports (6) 85:4;118:17,22;119:3,6,13 represent (11) 36:20;41:3;44:2;53:24; 66:11;71:8;74:6;84:20;	111:22;236:6;238:4 representative (1) 126:7 represented (7) 66:9;84:22;86:18;141:21; 190:4;238:21;251:2 representing (3) 72:2;113:25;201:24 represents (12) 15:18;31:1;128:6,7; 140:18;145:11;167:4; 189:19;190:4,18;194:24; 195:4 request (2) 9:20;181:14 requested (1) 181:15 requesting (1) 231:21 require (11) 25:17;37:14;39:13,23; 184:15;186:14;207:20; 214:19;232:5,11;234:9 required (12) 53:24;70:23;85:11;202:3, 7,7;210:1;211:22;214:6; 215:8;250:11,21 requirement (7) 52:22;159:25;167:15; 200:11;214:3;237:1;244:2 requirements (2) 206:22;214:13 requires (3) 37:16;148:18;231:2 requiring (1) 226:19 re-regulating (3) 16:7;20:23;59:11 reservoir (3) 16:7;20:23;59:11 residential (1) 80:1 resort (2) 249:25;250:7 Resource (6) 61:8,20;186:3;187:2; 206:2;207:10 resources (4) 112:20,24;138:20;148:3 resources' (1) 11:16 respect (1) 249:8 respective (2) 11:24;12:12 respond (1) 37:8 response (6) 120:14,22,23,25;208:21; 248:17 responses (1) 191:14 responsible (5)	191:7,8;203:5,18;209:23 rest (6) 22:13;31:20;84:23; 104:19;154:6;244:14 restate (1) 73:3 restrictions (1) 9:7 result (12) 11:11;12:6;46:7;48:8; 85:9;94:6;95:15;133:8; 135:2;163:18;206:19;207:18 resulted (1) 129:18 resulting (3) 11:1;190:2;205:8 results (8) 137:6,11;166:24;167:7; 170:14;182:13;189:19; 220:22 retained (1) 82:16 retains (1) 67:7 return (24) 42:2,5,8,18,23;43:10;44:7; 70:9,11;94:5;95:7;191:25; 192:6,9,11,14;193:19; 194:18;195:19;196:16; 241:12,16,19;242:11 returned (1) 115:11 returning (4) 43:3,7,23;44:4 returns (4) 46:11,21;242:17;253:10 reuse (5) 101:6,10;196:15,19,24 reused (3) 196:3,11,18 revenue (8) 45:13,16,23;46:6,11; 47:15;98:21,22 reverses (1) 12:11 review (19) 9:19;22:1;74:4;81:5,6; 113:22;115:12;121:18; 124:7,17;125:23;126:13; 132:10;201:8;213:24,25; 220:17,18;231:6 reviewed (3) 114:12;120:5;121:9 reviewing (5) 9:23;12:10;113:11; 114:16;122:3 reviews (1) 28:18 revised (2) 123:21;175:18 rider (1) 14:3 riders (2)	16:19;27:25 right (119) 8:12,21;9:7;12:23;13:4; 17:8,22;23:8,10;30:4;34:20; 35:21;40:18;55:23;56:5; 59:20,21;60:1,22;61:6,7,9; 62:3;64:10,22,23;65:8,18; 66:2,14;71:7,20;72:18; 75:18;78:9;80:21,23;81:10, 11,25;87:19;89:23,24,24; 93:2;96:1;97:2;98:7;103:7, 10,15,17,22,23;104:2,3,7; 109:14;110:16,24;111:14; 115:9,13;117:5,15;118:4; 120:25;129:25;134:19; 138:22;139:15;147:21; 150:9;151:18;153:4;164:16, 25;173:2;176:11;177:17; 179:11;185:12;188:8,23; 189:11,22;191:9;194:13; 197:9;198:11;200:1,21; 202:15;206:15;207:22; 208:4;209:14;213:5;216:15; 219:8,10;220:5;221:1;227:5; 228:17;234:8,16;236:9; 237:14;238:16;239:1; 240:21;246:22;249:7,19; 254:7,10,13;255:16 rights (26) 35:13;58:9;64:21;80:21; 81:15,16,19;82:1;103:15; 112:20,24;135:20;180:24, 25;202:16,18;210:23; 213:14;238:24;239:14,18; 240:1,5,6,18;249:3 Rio (1) 224:17 RISD (1) 168:23 risk (2) 21:9;208:18 River (31) 42:24;61:3;70:11,12;81:8, 15,17;82:2;97:15;102:14; 103:24;185:19,23;187:21, 25;189:14;190:25;192:12, 14,15,19,21;194:21,22; 195:20;197:7;202:16;223:9; 224:21,23;236:13 road (1) 107:13 roads (2) 36:8;39:5 Rock (2) 42:14;97:16 role (1) 202:5 rolled (1) 214:24 rolling (1) 171:6 rooftop (1) 52:17
---	--	--	---

<p>rooftops (2) 36:8;40:7</p> <p>room (4) 8:21;142:4;208:5,8</p> <p>rotate (9) 25:17;26:3,5,16,17,23; 27:3,14;88:24</p> <p>rotated (3) 25:20;88:7;108:9</p> <p>rotates (1) 26:11</p> <p>rotating (8) 25:25;26:14,19;27:9; 67:18,19;68:1;89:4</p> <p>rotation (4) 66:24;67:5,16;107:18</p> <p>rotations (2) 88:23;107:7</p> <p>roughly (10) 72:14;122:23;129:15; 146:14;158:23;162:23; 178:15;184:22;223:20; 224:10</p> <p>round (1) 137:5</p> <p>routine (3) 213:10,16,17</p> <p>routinely (2) 124:24;186:12</p> <p>rows (1) 171:2</p> <p>royalties (2) 46:19;98:16</p> <p>royalty (1) 46:25</p> <p>R-squared (18) 157:1,5;158:5,13,17; 159:18;161:18;162:8,11; 164:15,17;165:4,7,9;169:22; 170:1,6,9</p> <p>rubuttal (1) 256:6</p> <p>rule (3) 9:8;125:10,10</p> <p>rules (5) 66:22;212:9;237:8; 247:16;251:19</p> <p>ruling (3) 10:4,24;12:11</p> <p>rulings (2) 248:8;251:1</p> <p>run (8) 16:10;184:21;187:4; 189:24;190:4;208:23; 242:14;244:10</p> <p>running (1) 225:24</p> <p>runoff (6) 42:9;196:11;241:25,25; 242:5,12</p> <p>runs (5) 109:3;177:23;189:20; 207:6;225:25</p>	<p style="text-align: center;">S</p> <p>safety (1) 186:25</p> <p>same (50) 16:3;31:12;34:3;39:11,13; 41:16,24;57:24,25;58:19; 72:2;75:4;92:17;93:3,10,12; 95:24,25;96:2;97:8;125:5; 135:11;140:24;142:11; 143:10;144:18;150:21; 151:22;152:8,21;155:15; 158:24,24;160:6,9,10; 167:16;170:5,25;172:14,16; 175:18,21;176:1,4,17; 178:20;197:5;201:14;251:18</p> <p>Sarah (2) 111:13,22</p> <p>sauce (2) 124:21,22</p> <p>saving (1) 245:7</p> <p>savings (1) 95:12</p> <p>saw (2) 71:4;228:12</p> <p>saying (17) 22:11;33:14;40:24;41:14, 16,19;93:11;95:17,20;96:3; 106:23;180:12,20;209:19; 215:3;226:3,18</p> <p>scale (1) 87:4</p> <p>scan (1) 8:21</p> <p>scanned (1) 252:18</p> <p>scatter (6) 150:16;152:7,15;154:10; 157:23;158:2</p> <p>schedule (2) 255:14,22</p> <p>scheduled (1) 255:15</p> <p>Schroeder (1) 38:5</p> <p>scope (4) 47:8;91:21,24;132:14</p> <p>scrutinizes (1) 174:5</p> <p>scrutiny (2) 174:8;177:5</p> <p>sea (1) 182:12</p> <p>season (28) 17:5,6,7,25;18:12,14,19; 21:14;26:13;31:7,21;32:9; 43:24;44:1,5;62:15,22; 66:18;68:6;141:14;166:3; 211:22;212:16,18;214:4; 229:8,16;242:2</p> <p>seasonal (6) 136:17,19;137:3,5;144:20; 254:8</p>	<p>seasonally (1) 243:19</p> <p>seasons (4) 17:4;199:5;233:23;234:2</p> <p>seat (1) 13:12</p> <p>second (16) 10:8;63:12,14;64:20;66:2, 8;67:6;73:22;74:1,7,14;75:2; 81:22;147:23;162:3;183:2</p> <p>second-to-last (1) 235:6</p> <p>section (1) 83:20</p> <p>section-township-range (1) 83:17</p> <p>sediment (2) 17:17,19</p> <p>seeing (4) 142:8;156:2;157:23;198:5</p> <p>seeking (1) 64:10</p> <p>seem (4) 134:9;157:14;182:25; 186:3</p> <p>seemed (1) 232:4</p> <p>seeming (1) 62:6</p> <p>seems (6) 40:23;109:14;131:9; 155:3;181:23;185:25</p> <p>seep (1) 102:10</p> <p>seepage (2) 61:16;143:4</p> <p>seeps (4) 21:14;101:23;102:3; 242:17</p> <p>selected (3) 125:24;126:15;129:8</p> <p>selecting (1) 128:22</p> <p>self-fulfilling (1) 133:21</p> <p>sells (1) 27:20</p> <p>send (1) 117:16</p> <p>senior (9) 11:21;198:18;205:6; 206:3;207:13;215:20; 234:15;250:4,12</p> <p>seniors (12) 183:13;184:6;187:1; 205:24;208:19;213:6,13; 229:3;243:5;249:16;250:16, 20</p> <p>sense (6) 143:1;158:21;175:3; 176:9;219:2;239:13</p>	<p>sensing (2) 174:19;175:4</p> <p>sensitive (3) 137:10;155:4;172:3</p> <p>sent (2) 53:8;69:9</p> <p>sentence (3) 67:2,17;94:16</p> <p>sentences (1) 112:18</p> <p>separate (4) 132:14;156:8,18;189:24</p> <p>September (7) 141:16;153:6;162:20,21; 163:5;190:5;232:24</p> <p>series (4) 119:16,25;150:1;155:24</p> <p>serve (1) 66:25</p> <p>service (12) 21:1,4,16;36:19;37:25; 86:24;87:11,22;109:7; 194:19;195:2;241:17</p> <p>set (12) 65:6;132:25;143:22; 150:4;152:21;156:4,16; 168:22;170:15;174:25; 175:15;227:20</p> <p>sets (1) 150:3</p> <p>seven (4) 46:18;98:9;146:14;156:10</p> <p>several (8) 17:8;19:12;20:11,17; 140:10;174:2;198:7,14</p> <p>shaded (1) 145:16</p> <p>shaking (1) 197:22</p> <p>shall (3) 67:5,7;117:24</p> <p>shape (1) 141:11</p> <p>shapefile (5) 84:4;175:16;177:10,12; 217:15</p> <p>shapefiles (3) 86:14;174:11;177:5</p> <p>share (9) 24:19;27:15;32:11;39:23; 40:1;79:9,10,21;200:19</p> <p>shareholders (6) 16:2,17;21:2;77:3,25; 92:10</p> <p>shares (10) 24:10,12;27:19,21;28:4; 79:17;82:17,20;83:23,24</p> <p>sheriff (1) 216:6</p> <p>shift (2) 182:9,16</p> <p>shifted (1) 31:16</p>
---	---	--	--

<p>Shoestring (3) 16:5,13;20:14</p> <p>short (10) 104:24;107:3,14;138:1; 148:17;199:9;213:14; 230:25;235:24;249:16</p> <p>shortage (18) 11:22;95:14;148:18; 170:17,25;171:15,18,25; 172:9;183:16;184:16;191:5; 203:6,7,20;206:22;209:21; 226:22</p> <p>shortages (10) 171:10,11;172:12,19; 198:21;199:17;200:3;202:8; 207:1;210:3</p> <p>shortened (2) 233:23;234:2</p> <p>shortfall (9) 74:24;75:3;76:21;170:16; 203:2,10;204:9;205:8;229:7</p> <p>shortfalls (1) 76:23</p> <p>shorting (1) 106:22</p> <p>shot (1) 252:17</p> <p>shoulder (2) 137:9;223:5</p> <p>shoulders (1) 208:19</p> <p>shove (1) 18:8</p> <p>show (14) 40:3,8;48:6;102:24; 118:16;156:17;185:10,16; 204:13,21,25;205:2;211:13; 252:1</p> <p>showed (2) 48:17;228:13</p> <p>showing (9) 43:20;140:5;144:12; 150:13;172:13;174:16; 177:13;193:17;218:6</p> <p>shown (14) 35:24;76:12;145:8,17; 146:15;150:17;161:21; 164:24;166:11;170:15; 189:12;243:9,13;253:24</p> <p>shows (18) 8:17;18:1;31:8;49:2; 83:22;140:4;144:19;145:24; 151:15;153:17;172:17; 189:16,20;194:14;199:8; 211:16;220:18;223:25</p> <p>shutoff (1) 213:13</p> <p>side (7) 75:22,22;146:19;154:21; 159:14;217:24,25</p> <p>sides (1) 251:18</p> <p>sidewalks (3)</p>	<p>36:8;40:7;52:17</p> <p>sign (1) 28:16</p> <p>signature (1) 61:15</p> <p>signed (1) 61:13</p> <p>significant (8) 43:3,7,16;61:25;82:12,14; 87:14;157:11</p> <p>significantly (5) 32:21;33:1;43:10;70:15; 175:7</p> <p>Sigstedt (2) 255:15;256:4</p> <p>silt (1) 18:20</p> <p>similar (9) 26:15;124:23;151:22; 154:7;156:15;178:18;214:9; 216:24;235:20</p> <p>similarities (1) 235:21</p> <p>similarly (1) 77:12</p> <p>simple (5) 31:12;41:7;126:14;147:9; 160:5</p> <p>simplifies (1) 110:16</p> <p>simply (5) 94:7,16;223:22;227:14; 243:19</p> <p>simulates (1) 189:23</p> <p>single (1) 232:8</p> <p>sinks (2) 108:24;109:4</p> <p>sites (1) 90:19</p> <p>situation (13) 26:15;101:4;134:10; 137:24;138:3;154:7;165:20; 187:19;191:10;215:5,6; 225:7;226:9</p> <p>situations (4) 135:17,18;136:16;161:17</p> <p>six (1) 126:9</p> <p>size (1) 142:18</p> <p>slated (1) 12:23</p> <p>slide (1) 110:9</p> <p>slope (1) 154:4</p> <p>slow (2) 19:7;247:21</p> <p>small (17) 64:24;87:4,8;100:21; 124:9;127:3;128:4,6;137:10;</p>	<p>161:13,16;171:23;172:7; 173:2;185:3;199:17;210:20</p> <p>smaller (6) 16:15;46:20;114:4;143:8; 204:11,17</p> <p>Snake (18) 42:24;61:3;70:11;81:8,15, 17;82:2;97:15;102:14; 113:15,23;185:19;187:21, 25;202:16;223:9;224:21; 236:13</p> <p>sod (2) 97:1,6</p> <p>soil (12) 51:4;66:21;88:2;108:9; 136:23;157:24;166:2;244:3; 245:15,19;254:16,19</p> <p>soils (1) 224:9</p> <p>solid (1) 140:17</p> <p>solution (2) 186:11;210:13</p> <p>somebody (5) 94:25;95:10;108:22; 109:2;117:13</p> <p>someone (1) 206:8</p> <p>sometime (5) 184:11;188:25;190:14; 209:7;229:12</p> <p>sometimes (2) 154:8;214:11</p> <p>somewhat (3) 20:23;50:8;82:14</p> <p>Somewhere (6) 20:21;22:9;59:17;74:18; 79:19,20</p> <p>soon (1) 22:22</p> <p>Sophia (1) 255:15</p> <p>Sophia's (1) 120:15</p> <p>sorry (27) 8:8;12:19;15:2;36:13; 56:15;87:5;99:10,12;116:3; 120:18;131:24;157:16,17; 159:11;164:16;168:5; 169:21;184:9,9;185:14; 186:7;189:3;194:3;216:20; 232:9;235:1;242:24</p> <p>sort (18) 113:21;119:18;123:7; 125:4;146:7;149:16;151:25; 160:24;165:15;179:24; 185:23;191:1;200:5;213:14; 214:7,24;241:14;243:16</p> <p>sorts (1) 215:22</p> <p>sound (3) 60:1;129:25;220:5</p> <p>sounds (3)</p>	<p>138:22;236:9;255:9</p> <p>source (8) 15:6,8;61:2;62:2,7;122:13; 193:6;239:22</p> <p>sourced (1) 49:9</p> <p>sources (2) 192:25;241:18</p> <p>South (2) 46:14;98:6</p> <p>southern (1) 238:13</p> <p>space (2) 41:23;52:15</p> <p>Spackman (1) 11:8</p> <p>Spain (1) 115:10</p> <p>speaking (1) 70:13</p> <p>speaks (1) 231:12</p> <p>specific (7) 20:19;37:15;54:21; 180:15;215:6;238:9;244:19</p> <p>specifically (6) 54:17,21;79:25;142:12; 195:10;199:13</p> <p>specifics (1) 238:11</p> <p>spectrum (2) 251:11,16</p> <p>speed (2) 23:22;247:22</p> <p>spell (1) 13:19</p> <p>spelling (1) 112:1</p> <p>spend (2) 17:15;132:20</p> <p>spending (1) 19:18</p> <p>spent (1) 114:18</p> <p>SPF (1) 36:22</p> <p>spill (3) 70:12,23;71:5</p> <p>spilled (1) 225:24</p> <p>spilling (1) 43:10</p> <p>spills (4) 42:20;70:14,18,22</p> <p>spoke (1) 42:22</p> <p>spot (1) 195:22</p> <p>spotty (1) 115:15</p> <p>spread (1) 157:19</p> <p>spreadsheet (2)</p>
--	--	--	--

<p>127:5,10 spring (11) 33:23;89:12;141:13;221:7, 17,22,24;222:19,21;223:2; 244:8 Springs (3) 11:7,7;47:19 sprinkler (22) 19:14,19,20;29:8,14; 32:23,24;92:4,7;93:5;95:1, 11,16,19;96:5;108:20;109:2, 6;123:1;130:25;146:6; 226:15 sprinklers (11) 28:24;29:17;32:22;92:7, 11,14;95:21;97:18;147:10; 196:1,4 Spronk (2) 112:8;120:21 square (2) 54:7;86:19 squint (1) 190:7 SRBA (2) 82:9;113:9 stacked (1) 104:1 staff (6) 19:24;120:4,9,14,23;121:1 stake (1) 136:7 stamp (2) 38:21,23 stand (4) 58:12;110:23;119:2,5 standard (21) 123:24;124:18;135:15; 136:19;149:11;155:10; 180:3;201:10,16;213:20; 225:5,6,9,11,14,18;231:10; 232:2;237:21,22;248:15 standards (4) 124:17;134:1;226:1,14 standpoint (1) 90:8 start (15) 13:23;16:21;17:18;41:21; 44:22;111:25;115:8;125:21; 139:5;141:13;149:18,19; 166:19;217:1;255:21 started (5) 13:25;14:3;31:13;68:4; 194:14 starting (9) 17:21;62:22;65:19;66:3,6; 149:24,25;152:25;155:22 starts (2) 211:23;214:4 state (42) 13:19;22:11;27:10;29:13; 35:5;52:23;64:15;67:8; 71:17;72:18;101:17;122:15; 182:7,10,16,19,24;183:8,11;</p>	<p>186:6,8,10;187:10,22,23; 188:2;189:1,15,19;190:13, 16;191:2,9;202:13,22;203:1, 9;204:1,22;207:15,18; 208:20 stated (18) 25:10,16;36:3;39:13;42:3; 43:2,7;50:2;53:2;57:19; 63:22;67:17;75:8,12;77:2, 12,24;78:3 statement (9) 22:17;58:23;94:4;101:15, 21;227:8;228:4;234:24; 235:2 statements (6) 47:7;102:21,23;116:24; 124:23,25 states (3) 72:21;103:25;237:6 stating (2) 111:25;230:15 statistics (1) 220:6 stay (3) 47:16,18;246:18 stayed (1) 71:18 stays (3) 97:8;160:9,10 stead (1) 187:22 steady (32) 35:5;122:15;182:7,10,16, 19,24;183:7,11;186:6,8,10; 187:10,22;188:2;189:1,15, 19;190:12,16;191:2,9; 202:13,22;203:1,9;204:1,22; 207:15,18;208:20;244:17 steep (1) 151:8 steeper (1) 151:7 Step (4) 37:16;52:23;69:11;173:2 stepping (1) 164:24 steps (1) 173:2 stick (1) 211:7 sticker (1) 194:6 still (28) 29:7;52:15;93:2,3;96:6; 102:8;108:21;110:11;119:2, 5;127:16,19;128:10,20; 129:6;137:4;149:7;154:10; 171:20;221:7,14;222:3,7,14; 229:9,12;230:25;240:11 stipulated (1) 112:13 stipulation (2) 81:9,23</p>	<p>stock (1) 79:11 stockholder (1) 93:12 stockholders (3) 88:23;89:12;102:16 stop (3) 66:15;167:1;219:9 stopped (1) 10:10 storage (5) 97:17;103:25;168:13; 205:24;229:12 store (1) 97:17 stored (1) 166:2 stores (1) 52:6 storing (1) 244:3 straight (2) 98:8;230:23 strains (1) 206:23 straying (2) 155:18,19 stream (1) 195:16 streams (1) 241:22 streets (2) 39:4;40:7 stress (1) 183:4 stretches (1) 224:9 stricken (4) 22:8,13;124:9;125:5 strike (2) 107:18,22 strip (1) 52:6 strive (1) 96:8 strong (2) 156:21;159:16 struck (1) 182:21 structures (6) 18:25;19:4,5,6,10;20:18 struggled (1) 45:25 struggles (1) 46:3 struggling (2) 10:12;108:21 stubble (2) 88:2,3 stuck (1) 176:3 studied (2) 233:21;236:23</p>	<p>studies (3) 39:18;40:3,7 study (2) 40:11;91:13 stuff (5) 97:1;115:16;211:15; 219:11;227:4 stump (1) 201:1 subdivision (6) 39:4,9;40:8;41:11,22; 96:14 subdivisions (13) 35:19;36:7;37:14,18,20; 39:13,17;40:4;41:14;96:12, 13,17;97:3 subject (4) 122:7;132:10;133:6; 240:22 subjects (1) 120:3 submit (3) 181:13,20;214:22 submitted (11) 38:1,3;114:13;120:5,13, 22;121:11;126:3;181:24; 213:11,22 subsequent (2) 9:24;244:4 substantial (1) 11:11 substantially (2) 202:17,20 substantive (2) 116:25;212:10 substitute (1) 212:6 subsurface (1) 102:5 succinct (5) 254:25;256:8,9,10,15 sudden (2) 137:11;183:6 suffer (5) 11:18;93:9;199:4,10,11 suffice (1) 171:9 sufficient (5) 66:10;89:19;107:25; 212:24;229:20 sugar (6) 26:11;87:1;88:7;105:24; 106:12,19 suggest (8) 68:10;83:14;131:2;154:5; 155:5;176:8;177:20;211:18 suggested (4) 25:24;43:9;130:16;180:17 suggesting (4) 148:11;180:13,23;234:5 suggestion (1) 179:3 suggestions (2)</p>
--	---	--	--

<p>28:15;132:17 suggests (6) 151:24;157:20;159:4,19; 176:11;178:21 Sukow (2) 188:8;193:11 Sukow's (1) 204:7 Sullivan (23) 110:23;111:1,14,20;112:2; 115:7;116:18;118:11;124:6; 125:21;132:20;133:11; 139:3;179:11;193:3;194:13; 197:21;198:3;230:3;232:19; 235:1;247:3;255:7 S-u-l-l-i-v-a-n (1) 112:3 Sullivan's (1) 246:5 sum (1) 167:11 summaries (1) 194:16 summarized (2) 114:24;199:7 summarizing (1) 193:18 summary (5) 121:22;166:23;167:5; 172:11,20 supervisor (2) 14:5;19:17 Supplemental (23) 63:15,16,21;122:12; 179:13,16,18,20,22;180:1,7; 181:3,7,10,13,17;182:3; 238:2,21,24;239:6;240:5,21 supplied (2) 229:7;236:3 supplies (4) 88:24;137:20;178:9;234:1 supply (26) 9:7;25:21;26:21;33:23; 77:4,11,14;89:17;90:23; 94:8;102:7;107:3;137:22; 168:1,4,5,14;170:18,19; 172:6;179:21;206:23;212:6, 17;233:14;244:17 support (2) 62:1;91:19 suppose (6) 27:12;46:8;50:13,15; 62:25;239:22 Supreme (1) 11:9 Sure (26) 10:9,15;17:3,22;18:21; 19:9,20;37:9;72:8;80:4; 82:25;99:13;111:6;115:25; 128:10;129:1;168:15; 205:17,19;206:24;213:25; 231:8;243:21;246:8;254:2,3 Surface (71)</p>	<p>9:9;13:7;14:8;23:20; 47:17;55:9,20;57:3,15,22; 58:17;70:12;84:3;113:5; 114:6,7,15;118:23,25; 122:10,13,22;123:18;128:8; 129:21;130:2,17;134:11; 135:12;136:2;137:16; 140:11;141:5;143:22;145:6, 13,21,25;147:1,19;148:11; 150:5,17;156:9,18;166:22; 167:13;171:21;174:17; 176:10;177:4;181:11,12,16; 182:3;192:19;199:4;202:19; 206:5;222:25;224:22; 226:24;236:4,11;238:5,9,16; 241:25;245:10;252:4;254:11 surface-to-surface (1) 237:13 surprise (2) 44:3;205:16 surprised (1) 130:20 surrounding (1) 9:6 sustain (4) 72:4;90:5;92:2;97:19 sustaining (1) 99:20 SWC (2) 199:8,9 swings (1) 171:24 switch (4) 86:21;173:8;179:12; 191:13 sworn (3) 13:8;111:3,14 synonyms (1) 94:18 system (67) 16:7,11;17:2;18:7,8,25; 19:21;20:20,22;21:5,7,17; 42:12,19;46:18;59:6,66:23; 67:1,4,7,16;68:11;70:19; 89:3;90:2,9,15;92:23;94:5,7; 95:7,8,12;96:23;97:12,13,15; 100:2;101:12;102:6;107:7; 137:19;138:9;142:18;143:8; 146:6;196:12,14;220:4,7,8,9; 222:4,8,15;223:19;224:7,12; 226:7;235:20;236:1;243:17; 245:1,5,6,9;252:7 systems (34) 18:23;19:19,20;114:19; 123:25;134:9;135:16,19; 136:1,11,14;138:2;142:5; 143:3,5,14,22;144:1,5; 148:22;178:6,11;222:25; 224:5,17,20;225:1;226:2,5; 227:9;236:10;237:17;245:2; 247:13</p>	<p style="text-align: center;">T</p> <p>table (11) 63:14;121:24;140:25; 144:17;166:23;167:4;169:7; 172:10,13;232:21;238:4 tables (5) 76:15;159:10;166:14; 170:2;241:3 tabulated (2) 181:21;227:16 tags (1) 216:6 tail (2) 46:21;98:13 talk (39) 12:21;24:9;32:12;35:19; 42:2,7;49:22;59:4;64:22; 121:23;123:2;134:20;140:3; 142:8;147:22;150:4;164:14; 165:16;166:5,15;167:2; 169:8;173:8;179:12;181:25; 182:6;189:17;202:9;209:15; 211:17;212:10;216:12; 219:18;221:6;224:10;230:8; 236:16;238:1;241:24 talked (27) 29:12,21;30:8;33:13;34:8; 35:23;48:24;51:1,59;19; 83:15;103:14;134:22;135:4; 142:20;173:1;175:12; 176:22;185:12;192:4; 202:10,14;203:21;215:17; 232:16;233:13;234:13; 235:15 talking (36) 37:15;42:14;51:6;59:7; 61:5;101:5;105:16;106:4; 118:13,14;132:9,20;138:19; 148:2,5;152:22;159:14; 161:8;162:6;168:19;172:15; 173:15;189:17;204:18; 206:10;214:5;222:6,6,12; 223:10;224:12;225:4,6,10; 227:4;230:22 talks (3) 86:23;124:11,13 targeted (1) 206:1 tasks (1) 113:20 Technical (9) 113:18;119:20;120:22; 121:11;126:1;174:13; 180:16,18;188:11 techniques (1) 149:11 technologies (4) 99:22;100:1,2,10 technology (3) 100:4,8;146:7 telemetry (1)</p>	<p>214:6 telling (1) 247:22 tells (2) 154:15;158:19 temporarily (1) 244:8 ten (2) 44:15;252:14 Tend (2) 158:15;223:1 term (5) 9:14;141:3;154:12;168:8; 241:12 termed (1) 145:18 terminology (3) 225:15;241:15;254:5 terms (4) 105:3;135:18;179:20; 250:10 test (3) 163:22;172:25;226:10 tested (1) 186:19 testified (16) 13:9;47:9;79:7;86:2; 90:13;93:4;98:12,19;105:18; 111:4;131:20;195:25; 226:18;230:24;235:7;249:21 testify (3) 107:19;241:24;255:16 Testimony (85) 14:15;15:23;22:2,13,19, 20,23,25,25;23:12,22;24:1, 11;29:12;39:13,15;40:13; 42:3,25;43:5,8,14,44:3; 49:25;50:3;51:5;59:5;71:12, 14;79:16,23;80:2;86:22; 89:12;94:4,9,11,12,25;96:16, 16;102:20;103:12;105:21, 25;106:10,21;107:1,18; 108:1;109:6,21;110:7; 116:17;131:22;132:13,25; 139:7,23;174:2,9;180:22; 188:14;191:14,16;193:11, 20;196:3;198:22;199:8; 205:11,15,17,17;208:13,24; 235:16;238:2;248:25;250:2, 14,18;252:19,22;254:4 Texas (1) 224:15 TFCC (1) 241:12 TFCC's (1) 78:4 Techniques (6) 8:12;41:10;99:5;110:18; 170:4;179:3 theme (1) 133:4 theoretical (1) 153:14</p>
---	--	---	---

theory (4) 134:8;210:21;211:11; 219:20	threshold (2) 86:9;251:15	48:14	treat (1) 18:5
thereby (2) 66:9;70:20	throughout (7) 18:5,18;21:14;26:13,15; 90:2;93:6	topics (1) 23:25	trendline (8) 150:19;151:7;153:9;154:3, 8;157:1,2;162:5
there'd (1) 177:16	throw (2) 44:14;223:12	torn (1) 92:1	trendlines (2) 153:13;156:25
therefor (1) 66:14	thus (1) 70:18	total (11) 21:7;79:17;86:7;93:24; 103:5;128:5,9;129:10;138:8; 185:7;217:21	trends (1) 178:6
therefore (3) 187:22;197:6;209:22	tick (1) 147:15	totaled (3) 43:25;217:7;241:7	tribunal (1) 12:10
therein (1) 71:17	ticking (1) 147:12	totalizers (1) 93:19	tributaries (3) 42:13;195:6;242:1
thereof (1) 66:10	tie (1) 159:8	totalizing (1) 214:16	tributary (8) 42:20,20;61:3;195:13,14, 15,22;241:21
thinking (1) 191:3	tiers (1) 251:25	Touché (1) 248:1	tried (1) 127:22
third (2) 98:10;196:20	tighten (1) 158:3	toured (1) 219:21	true (25) 32:5;43:23;51:23;52:9; 72:9,25;73:4,8,17,21;74:12, 23;75:2;76:8,14;77:1;104:8; 134:8,8,9;143:1;196:10; 222:24;238:16,17
third-party (1) 98:16	tiles (3) 101:24;102:3,10	toward (1) 201:7	truly (1) 206:25
Thompson (61) 13:1,2,13,14,14,18;15:12, 15;19:23;21:18;22:15,16; 37:1,23;38:3,10,21;40:14,17, 20;44:22;47:3,4;48:2;49:6; 51:15;55:13,20,24;56:4,6; 58:10;71:25;91:20;99:8; 100:14,17;105:7,9,16;106:5; 109:18,25;132:7;229:19,22; 230:2,3;231:19;239:18,25; 242:20,23,24;243:2;245:18, 24,25;246:4;255:4,5	tillage (4) 245:15,19;254:16,20	to-wit (2) 65:24;66:3	truncate (1) 24:4
thorough (1) 114:14	times (15) 11:22;33:22;66:20;88:1; 134:10,11,23;154:9;159:25; 167:14;173:16;175:20; 211:20;213:5;243:10	township (1) 83:20	trust (2) 85:24;210:16
thoroughly (3) 45:20;101:18;117:4	timing (2) 109:14;255:10	track (12) 27:15;28:3;50:3,12,16; 52:5;53:20;70:10;83:12,24; 86:6;93:24	truth (2) 13:8;111:3
though (10) 23:13;50:21;61:11; 161:12;169:8;176:11;225:3; 245:23;247:23;252:5	tiniest (1) 128:3	tracked (1) 27:17	try (7) 20:10;29:2;45:1;79:3; 117:8;135:3;221:11
thought (12) 10:11;56:6;127:20; 128:15;142:1;146:3,22; 189:5;197:13;209:4,5; 215:19	tiny (6) 126:12,12;128:3,9,9; 129:16	tracking (3) 42:8;83:25;87:5	trying (12) 22:22;33:17;37:17;38:16; 65:1,3;129:7;136:21;188:20; 200:25;218:19;219:9
thousand (1) 178:21	title (2) 36:17,24	tracks (1) 42:5	TSCHOHL (2) 111:6,10
thousands (1) 135:23	titled (8) 14:15;37:23;84:16; 144:10;155:24,25;168:22; 172:11	tract (5) 50:9,14,19,24;241:16	Tuesday (1) 26:4
threat (1) 211:7	TJ (3) 83:9;252:15;255:19	tractors (1) 17:8	tune (1) 54:3
three (17) 46:13;63:22;80:21;81:19; 88:16;97:25;98:4,24;114:18; 168:19,25;175:6;182:17,18; 211:20;219:13,16	today (18) 32:9;57:16;65:4;78:25; 90:13;98:12;103:22;109:15; 121:15;123:2;190:21;209:2, 3;218:19;235:7;240:7,7; 247:18	trajectory (1) 102:8	tunnels (1) 102:10
three-quarter-inch (1) 248:9	together (4) 14:14;15:17;30:15;199:7	transcript (7) 54:24;55:5,18;56:2;57:24; 58:1;104:11	turn (33) 8:13,14;12:17;14:21; 21:19;35:20;39:25;44:21; 53:13;55:5;63:4;64:20; 66:24;71:15;74:22;75:20; 77:17;81:1;84:8;85:9;89:13, 14;100:20,23;102:18; 104:10;121:24;129:3;142:7; 188:4;232:17,19;234:24
three-quarters (11) 31:1,6,13;32:11;48:18; 68:7,16;79:8;93:12;236:19; 248:22	tomorrow (4) 97:18;255:15;256:5,19	transfer (10) 27:21;28:6,6,8,10,16,18, 20;83:18;135:24	turned (2) 16:19;129:4
	took (3) 23:17;175:23;176:1	transferred (2) 82:18,21	turning (1) 159:15
	top (10) 61:18;64:12;104:1; 142:15;144:17;155:8; 194:19;241:13;243:12; 244:16	transient (15) 35:5;122:15;182:8,10,16, 19,24;183:5,7,12;184:14; 186:9;187:4;190:3;202:12	turns (2) 62:15;128:20
	topic (1)	transmission (2) 19:13;80:11	Twin (128)
		transparent (1) 213:24	
		Travis (10) 13:14;38:23;40:16;55:18, 22;56:1,9;106:16;230:3,5	

<p>13:24;14:17,24;22:10; 23:18;24:10,14;25:20;26:22; 29:13;33:14;35:9,13,25; 36:19;37:24;39:18,23;41:12; 42:4;43:3,23;44:4,13;46:4, 10;47:22;49:1,11;52:5;53:3, 19;55:10;56:6;57:4,14,17, 22;58:5,6,8;59:13;62:15; 63:22;64:16;68:6;70:10; 71:7;74:7,13,24;75:9,12; 76:9,11,15;77:2,25;79:13; 80:20;81:14;83:1;84:5;85:1, 3,20,24;86:3;89:16;90:14; 91:9;95:17;98:1,2,15,20; 101:5,18;107:7;110:3;144:2; 146:20;154:21;159:14,15,17, 19;162:2,10;166:25;172:15; 175:10,11,12,16;178:19; 191:25;192:6,9;193:19; 194:19,22;195:3,6,22;196:1, 13;200:17;217:10;220:1,2,2, 8;221:13;223:6,8;224:19; 225:11,13;228:9;235:2; 244:9,15,23;248:10;251:3,8, 252:3</p> <p>two (26) 10:23;17:4;18:13;21:21; 51:3;68:21;72:1;74:19; 75:14;76:15;88:16;91:3,5; 121:15;142:21;150:3;157:9; 166:21;169:17;170:12; 171:15;173:13;179:4; 211:20;215:10;251:18</p> <p>type (3) 47:11;83:11;89:4</p> <p>types (1) 108:8</p> <p>typical (3) 39:4;67:20,23</p> <p>typically (25) 18:13;19:10;45:16;77:6,9, 11;78:3;87:17;89:7,9;90:1; 101:11;136:19;137:2; 214:13,15,18;220:13,16; 222:20;223:3,4,25;235:23; 245:2</p>	<p>underground (2) 11:16;192:20</p> <p>underlying (2) 12:4;37:3</p> <p>understood (6) 32:2;89:6,11;92:6;102:15; 250:18</p> <p>undertaken (2) 71:2;75:16</p> <p>unduly (1) 37:4</p> <p>unit (3) 137:18,21;235:15</p> <p>unless (1) 210:11</p> <p>unreasonable (3) 222:23;223:17;226:6</p> <p>unsealed (1) 55:4</p> <p>up (89) 12:11;14:3;16:23;17:21, 21;18:1,1,8,20;23:22;25:6; 33:11;34:18;41:13;42:8; 46:8;49:19;55:15;67:22,23; 69:7;71:11;73:12;79:20; 88:17,19;97:18;100:6;116:5; 122:6;131:16;132:12,25; 134:15;135:22;137:17; 138:8;141:14,23;143:15; 144:3;146:11;147:12,15; 151:24;153:24;154:8;158:4; 159:3,6;160:13;162:23; 163:9;164:3;165:24;167:3,7; 169:7;176:1,4,17;177:21; 181:2;185:10,16;186:16; 204:13,21,25;205:2;211:13, 16;214:1,24;217:1;218:3; 224:23;226:16;227:11; 228:15,16,19,21;235:24; 241:6;244:16;247:4,22; 254:6</p> <p>update (2) 84:4;177:24</p> <p>updated (10) 119:8,11;122:9;123:16; 127:14;128:1,19;146:25; 147:4,6</p> <p>upon (6) 11:23;14:18;66:22; 101:20;228:22;237:5</p> <p>upper (3) 151:18;165:12;243:13</p> <p>upper-left (1) 153:4</p> <p>Urban (1) 39:9</p> <p>urbanization (1) 178:7</p> <p>URL (1) 193:10</p> <p>use (106) 11:19;27:24;28:4,5;37:17, 20;40:4,8;66:20;67:12;80:1;</p>	<p>81:25;82:3;92:20;96:13,19, 25;101:12;131:25;132:17; 135:3,5,19,24;136:6;137:3; 139:9;143:25;149:8,8;159:3, 7;161:13,14,18;162:9,25; 163:11,19,25;164:18,19,21; 171:4;172:3,22;173:6; 174:10;176:23,25;177:8,18, 22;180:8;181:1,3,10,23; 182:3,24;184:23,24,25; 185:9;186:3,10;187:9,10,22; 196:10,16,19,20,23;197:4,5; 200:5;203:15;204:2;206:2; 207:10;208:20;214:11; 215:21;216:17;217:3,13; 219:5;223:16;225:15; 230:25;233:10;237:2; 239:13;240:11,15,17;243:4; 244:4;245:9,15,19,20,23; 250:16;251:1</p> <p>used (71) 9:14;33:25;61:8;62:23; 67:6;80:8;85:7;87:11;96:14; 119:5;122:11;127:12; 129:23;131:7,23;133:18,19; 136:8,12;137:14,15,17; 138:13;140:7,9,20,23; 146:18;148:7,8;149:17; 161:1;167:18,21,24;169:23; 170:7,9;171:3;173:7,11,13, 14,22;174:4;178:23;181:24; 182:20;183:5,7;191:3; 192:16;202:23;203:9; 207:19,20;217:24;218:22; 219:5;229:3;231:21;234:6,8; 239:9;240:1,7;241:15,16; 244:12;245:2;251:24</p> <p>user (19) 39:24;47:7,16,17;143:23; 153:10;197:20;203:4;208:5, 8;211:21,21;212:22;213:2; 232:5,6,8;237:1;250:7</p> <p>users (55) 18:9;19:19;21:4,16,25; 66:25;85:10,12,20,24;88:17; 91:12,17;101:1;105:10; 131:16;146:12;148:24; 152:24;153:22;155:1; 159:13;165:17;175:6,9; 186:2,24;191:5;197:2; 198:18;202:19;203:5,6,18; 207:21,23;208:2,4;210:5,19; 213:20,21,24;214:6,10; 215:7,23;221:8;222:4,8; 226:16;229:12;238:15; 245:1,4</p> <p>uses (9) 72:25;73:4;132:3,24; 133:14;168:8;179:19; 210:17;254:17</p> <p>using (40) 26:12;35:4;41:12,14,18; 61:6;70:18;96:22;123:6;</p>	<p>127:8,16;138:9;152:10; 162:16;163:13,14,15; 164:20;165:5;168:7,12; 169:9,21;171:8;173:4;188:2; 201:16;202:12;203:12; 204:22;205:22;207:14; 218:7,8,20;219:1;221:13; 227:19;243:8;245:18</p> <p>utilize (1) 105:17</p> <p>utilized (1) 179:24</p> <p>utilizes (1) 84:25</p>
<p style="text-align: center;">U</p> <p>ultimately (8) 120:4;186:11;199:18; 201:22;204:13;206:21; 214:22,24</p> <p>uncorrected (1) 127:19</p> <p>under (26) 69:10;73:9,18,22;74:7; 75:2;88:5;109:8;138:7; 148:12;151:16;168:23; 169:16;187:3;189:15;193:5; 210:21;211:21;212:23; 213:9;214:4;224:16;226:2; 229:13;245:6;250:23</p>		<p>validation (1) 146:17</p> <p>valuable (1) 107:5</p> <p>value (12) 46:24;127:17;157:1; 161:14;163:16,16;164:19,21, 22,22;165:10;167:17</p> <p>values (12) 155:18,19;156:17;165:1; 167:7,12,17;170:1;172:22; 173:11;239:9;243:9</p> <p>variable (1) 105:5</p> <p>variation (1) 158:25</p> <p>varied (1) 86:4</p> <p>varies (1) 215:14</p> <p>various (2) 103:24;178:12</p> <p>vary (6) 108:3;136:21;145:14; 153:23;157:22;237:25</p> <p>vast (2) 184:5;238:13</p> <p>verbally (1) 12:6</p> <p>verify (1) 126:16</p> <p>version (3) 15:22;116:1;117:3</p> <p>versus (14) 11:8;47:17;95:21;107:20; 108:6,16;153:2,8;156:6; 192:20,24;202:13;248:9; 253:24</p> <p>viability (2) 207:8,9</p> <p>viewed (1) 212:12</p> <p>virtually (2) 94:18;187:20</p> <p>vis-à-vis (1) 225:16</p>	

<p>volume (3) 41:6,24;93:24</p> <p>voluminous (1) 114:13</p> <p>vs (1) 144:11</p>	<p>12,15,22;135:6,12,20;136:3,9,23;137:10,16,20;138:1,2,15,18,20;139:9;140:11;141:5;143:4,17,20,22,25;144:6;145:6,13,21,25;147:1,19;148:3,11;150:6,7,15,17,24;151:3,10,13,20;152:8,9,11;153:2,8,8,13,15;154:12,17;155:4;156:1,6,9,13,18,22;157:24,25;158:20,25;159:3,7,20;160:1,3,6,7,9,11,14;161:12;163:19;164:2,3;166:22;167:12,13,13,23;169:4,19;171:21;173:14,24,25;174:18;175:20;176:10;177:4;178:9;180:24,25;181:11,13,16;182:3;183:13;185:3,25;186:23,24;189:2,14,21;190:1,4;192:15,18,19,20;195:23;196:9,20,24,24;197:3,6;198:10;199:4,6,9;202:19;204:2,3,13,16;205:23,24;206:5,5,6;210:7,22,23;211:16,21;212:10,17;213:6,12,14;214:4;218:10,14,19;220:10,24;221:8,11,14;222:3,4,7,14,25;223:20;224:8,22;226:24;227:17;228:2,9;229:16;233:10,14;236:4,7,11;237:1,2,14;238:5,9,16;241:17,18;242:16;244:1,3,18,21,22,25;245:5,7,10,14,15,18,19;247:7,13;248:5;249:16;250:4,6,16,21;251:2,9;252:4;253:7,19;254:12,20</p>	<p>weeds (3) 17:9,10;21:11</p> <p>week (1) 39:22</p> <p>weeks (2) 88:16;114:18</p> <p>weird (1) 165:17</p> <p>welcome (2) 91:15,18</p> <p>wells (19) 137:21;187:5,13,16,18,21,24;188:25;190:22,24;208:25,25;209:21,25;236:2,6;240:11,14,15</p> <p>wells' (1) 190:23</p> <p>weren't (1) 249:11</p> <p>west (3) 16:11;20:22;203:23</p> <p>wet (2) 183:13;186:19</p> <p>what's (21) 9:2;15:16;24:17;35:4,24;36:17;87:10;107:23;112:7;117:22;124:21;135:2;152:10;185:24;189:12;192:23;193:6;195:12;198:25;246:4;253:24</p> <p>wheat (11) 86:25;87:12,25;88:10;104:25;105:22;106:11,13,13,23,24</p> <p>whenever (2) 144:4;207:5</p> <p>whereas (1) 151:22</p> <p>whereby (1) 131:11</p> <p>white-and-black (1) 140:18</p> <p>whole (7) 96:5;112:25;158:21;206:3;207:8,25;208:1</p> <p>wholly (1) 168:11</p> <p>who's (2) 213:14,17</p> <p>whose (3) 146:20;205:16,17</p> <p>Wildman (2) 125:3;231:7</p> <p>willing (3) 91:12;139:2;197:18</p> <p>windfall (1) 186:1</p> <p>winter (3) 166:3;185:20;242:16</p> <p>wish (1) 160:23</p> <p>withdraw (2) 81:10;189:6</p>	<p>within (44) 16:7;20:20;25:14;26:11,14,17;27:14,19;33:14;36:18;37:17,24;39:22;44:12;50:14,19,22,24;52:7;54:4;66:19;67:11;68:2;77:13;86:3,15,23;87:21;90:19;91:24;101:14;102:12;105:4;127:9;143:23;149:15;150:3;163:23;171:21;181:18;229:14;238:8;239:7;243:13</p> <p>without (2) 210:20;237:10</p> <p>witness (31) 12:23,24;13:7;19:9;22:20;47:24;49:13;51:20;56:18,18;58:13;107:19;109:20,22;111:2;116:4,8;117:12;120:19;197:17;205:14;231:14;239:20;252:12;253:1,2;255:12,23,25;256:1,2</p> <p>witnessed (2) 80:4;102:1</p> <p>witnesses (4) 174:3;191:18;192:5;256:3</p> <p>wonder (1) 147:24</p> <p>WOOD (9) 75:23,25;76:2,4;117:13,17,21,23;118:9</p> <p>word (8) 65:19,24;116:22,22;199:13;201:5;231:24;248:18</p> <p>words (4) 43:6,15;70:12;165:11</p> <p>word (23) 14:19;18:17;20:15;45:6;57:10;90:14;112:18;115:15;119:10,11,20;120:22;121:12,23;122:1,18;136:1;141:6;145:20;149:15;174:13;213:22;215:22</p> <p>working (16) 13:23,25;19:19;112:19,23;114:5;126:1;163:23;171:20;180:16,18;188:11;207:12;214:1,1;229:14</p> <p>works (5) 19:21;59:6;101:21;183:25;210:14</p> <p>worry (1) 8:15</p> <p>worse (1) 64:25</p> <p>worth (2) 50:23;125:1</p> <p>wrap (1) 108:21</p> <p>written (7) 22:1,19,24;110:7;120:5;121:2;198:22</p> <p>wrong (1)</p>
W			
<p>wait (7) 143:7;160:10;193:12;239:16;245:16;253:5;255:18</p> <p>wall (2) 78:8,9</p> <p>wants (1) 12:10</p> <p>warmer (1) 233:1</p> <p>waste (16) 93:6;95:6,7;96:24;97:12,14;101:11;108:25;143:18;225:23,25;226:4,7;237:10;241:25;251:15</p> <p>wastes (2) 97:14;101:8</p> <p>wastewater (5) 94:24;95:1,11;96:9;101:9</p> <p>wasting (3) 251:9,22,22</p> <p>water (419) 9:7,7,9;11:16,20,22,23;13:7;14:8;15:8;16:1,4,16,19,21;17:14,20,22,25;18:9,9,15,22;19:13,19,24;20:16;21:4,16;23:20;25:17,25;26:3,5,12,22,23;27:4,22;28:10;34:19;36:22,23;37:14,17,21;39:14,24,25;40:1,4,8;41:6,22,24;42:16;43:4,8,10;46:10,22;47:7,17;48:7;51:23;52:2,3,10,13,15,18;54:4;55:9,20;57:3,15,23,58;59:20,21;61:8,9,16,20;62:20,20,23;64:10,16,21,21,23;65:18;66:16,17,23,25;68:5,14;70:18,22;77:4,8,11,14;79:14;80:21,21,23;81:10,11,15,16,19,25;82:1,17;83:3,18;84:3,25;85:6,21;88:6,15,17,24;89:7,9,16,23,24,24;90:9,23;92:11,13,19,20,21;93:1,5,12,16;94:7,17,20;95:5,12,14,18,23,25;96:14,18,19;97:11;101:6,17,23;102:5,7,10,13;103:10,14,17,22,23,25;104:2,7,24;105:17,23;106:22,25;107:3,14;108:23,24;109:3,8;110:3;112:8,20,20,23,24;113:6;114:6,8,15,20;118:23,25;120:21;122:10,13,22;123:18;124:24;128:8;129:21;130:2,17;131:17;132:1;134:6,11,</p>	<p>watermaster (1) 14:4</p> <p>watermasters (1) 28:8</p> <p>waterways (4) 16:16;18:4;20:19;21:12</p> <p>way (55) 16:3,11;19:20;30:14;32:18;34:18;41:21;55:10;57:3;68:4;77:5;97:7;99:25;114:10;125:13;136:2,2;139:14;147:18;149:10;150:2;151:16;153:25;181:8;183:5,25;186:22,22;187:1;188:1,3;190:19;191:1,3,10;197:2;203:8,14,21;204:23;205:20,22,23;209:19;210:9,14;212:14;214:7;222:10;225:18;245:12;246:4,9,13;251:18</p> <p>ways (5) 68:5;148:23;168:25;173:13;210:13</p> <p>weather (3) 66:21;173:18;218:12</p> <p>weed (1) 17:12</p>		

189:4		11.86 (1) 41:25	210:21;216:14,21
X	Z	1-10 (2) 80:22;81:11	190,000 (2) 41:5;223:19
XY (1) 150:16	zero (1) 78:4	1100 (1) 223:20	1900 (5) 63:23;90:1;103:15;104:2,3
Y	0	11a (3) 63:15,21;64:1	1902 (2) 67:20,20
y-axis (2) 140:13;189:25	0.625 (1) 31:16	12 (7) 63:6;71:23;73:8,16; 126:11;162:23;227:7	1903 (2) 64:17;103:11
year (136) 15:18;17:10,16,19,24; 18:11,18;19:3,5;24:25;30:1, 10,11;31:11;33:5;51:2,11; 53:23;54:1;59:16,17;61:19; 71:19;73:9,17,22;74:8,13; 75:4,4;78:9,12;84:19,20; 88:14;94:2;103:8;104:24; 107:3,13,14;108:3,3,16,16; 122:8;125:22,24;126:5,7,10, 15,20,25;127:1;128:13,19, 22,24,25;129:6,8,17,19; 130:12;131:7,12,13,13,16; 145:14,14;151:22;152:13, 14;160:3,7,8,12,12;164:1,6; 168:6,7,10,11,14;169:11; 171:5;177:24,25;178:4,4,15, 15;185:4,16,18;190:5,6,10; 203:11;204:6,10,21;205:1,3, 8;209:17;210:2,3,3,6;213:8; 219:6,22;220:11;228:19; 230:10,14,19;231:9,21; 232:2,12;233:14;234:3,4,6, 11,12,14,21;249:5,7,9	06 (4) 126:11,22;130:12;219:21	1-209 (2) 80:22;81:12	1915 (2) 90:1;102:4
	06/08/12 (2) 126:19;230:21	13 (5) 90:22;149:20,21,24;165:7	1930 (1) 102:4
	08 (1) 126:11	14 (8) 34:19;57:6,7;71:17;76:1,2; 129:25;149:19	1939 (1) 89:23
	1	14 (8) 34:19;57:6,7;71:17;76:1,2; 129:25;149:19	194 (1) 68:14
	1 (20) 14:11;15:8;21:22,24;23:2, 3;37:16;52:23;69:11;71:11, 15;94:13;100:20;167:20; 168:1,9,11;170:16,19;190:5	1-4 (2) 80:22;81:11	194,000 (3) 54:1;79:20;86:19
	1,000 (4) 16:15;67:24;220:3;221:15	142,000 (3) 129:15,19;130:11	1953 (7) 35:8,13;184:11,17,21; 190:7,10
	1,045,382 (2) 73:23;74:9	143,000 (3) 130:7,10,11	196,162 (1) 81:20
	1,060,011 (1) 73:19	15 (20) 29:18;32:14,16;54:7; 69:22;86:19;114:3;122:23; 123:10,11,19;147:3;179:5; 180:12;204:9,12,20;205:2,7; 207:14	1970 (1) 210:5
	1,062,098 (2) 72:11,22	150,000 (1) 43:24	1980 (1) 205:4
	1,100,000 (1) 71:19	154 (1) 218:1	1980s (6) 208:25;209:1,16;210:1,21, 23
	1,121,717 (1) 73:10	15-square (1) 224:10	1987 (3) 81:25;82:5,9
	1.1 (8) 40:25;41:5;72:19;79:21; 96:1,6;223:11;228:13	15-year (1) 169:10	1988 (3) 14:25;15:19,21
	1.325 (1) 185:8	17 (1) 22:9	1990 (10) 30:16,21;31:2,5;112:21; 114:25;146:2,13,21;227:19
	1.4 (1) 185:7	170 (2) 89:23,23	1990-to-2006 (2) 145:7,14
	1.625 (1) 185:17	171 (4) 36:11,13,15;38:24	1992 (1) 31:11
	1.7 (6) 184:23,25;185:13,14,15,22	179,000 (1) 178:19	1993 (1) 13:25
	1:00 (1) 110:18	179,066 (1) 171:1	1998 (1) 15:19
	10 (4) 34:19;55:12;63:15;92:8	18 (6) 77:20;100:25;104:17,20; 127:3;216:22	19th (2) 81:25;82:5
	10,000 (6) 18:25;54:1,3,7;86:19; 224:10	180 (1) 236:6	1A (10) 15:13,14,16;21:22,24; 23:2,3;40:15,20,23
	10:00 (1) 96:18	180- (3) 79:19;223:9,18	1st (2) 15:20;184:10
	100 (10) 19:2,4,5;165:14,19,24; 213:3;220:3;221:14;243:23	184 (1) 81:2	2
	11 (1) 63:5	187,000 (1) 178:19	2 (7) 61:13;63:4;119:17; 124:13;158:17;169:1;170:18
	11.6 (1) 41:15	18th (1) 31:20	20 (8) 22:9;92:8;94:14;100:25; 129:24;178:17;228:14;238:3
		19 (7) 35:25;49:3;84:18;170:2;	200,000 (2)

24:15;224:8 2000 (8) 72:10;127:9;128:2,17,18; 129:24;230:10,25 2000-to-2014 (1) 130:10 2002 (1) 14:25 2003 (1) 199:9 2005 (7) 44:20;114:7;198:10;199:5, 10,11;219:21 2006 (7) 115:1;126:6;146:3,13,21; 199:5;227:19 2007 (10) 132:19;135:13;141:6; 145:8;147:16;150:6;167:9; 226:23;238:24;254:7 2007's (1) 198:13 2008 (10) 28:24;29:7;36:21;38:3; 123:11;126:6;138:21; 144:11;181:12;252:1 2009 (2) 201:4,7 2010 (6) 15:25;20:6,8,21;36:1; 70:15 2011 (5) 11:8;20:21;174:22,25; 178:17 2012 (3) 90:22;126:6;233:8 2013 (1) 86:4 2014 (2) 130:1;231:7 2015 (3) 130:3,21;180:16 2015-ish (1) 59:18 2017 (3) 174:22,25;178:17 2018 (5) 73:1,5;129:9,11;130:13 2019 (1) 91:1 202,690 (1) 79:17 202,690.93 (1) 24:11 2020 (2) 49:3;59:23 2021 (21) 72:10;127:9;128:2,18; 150:6;167:10;170:25; 174:22,25;178:17;180:18; 216:18;217:3,7,21;218:1,2, 7;230:10,25 2022 (15)	15:2,19;119:20;128:11,16, 17;129:5;188:11;233:13,18, 21;234:1,5,17,20 2023 (6) 74:25;76:21;91:4;98:21; 182:16;218:21 2024 (1) 91:4 21 (2) 233:8;238:3 22 (3) 22:8;94:14;100:23 220 (1) 217:25 224 (2) 77:18;104:13 24 (4) 188:4;189:5;201:4;211:18 240,000 (2) 68:12,14 245,000 (1) 103:25 24th (1) 201:7 25 (6) 29:9;82:16,17;92:7;163:3; 211:19 26 (4) 25:5;189:9,11,13 27 (5) 14:21;15:23;40:13;71:15; 124:15 28th (1) 188:11 29th (1) 138:21 2nd (1) 64:17	190:5,17;207:5;228:14; 246:22 30,000 (1) 152:12 300 (9) 71:12;75:20,24;84:8; 121:5,9,16;130:16;232:17 300,000 (1) 44:5 301 (4) 74:22;121:6,16;184:9 3023 (1) 199:7 306 (4) 73:12;75:22,24;76:4 31 (1) 201:8 3-1 (14) 139:5,7,22;140:4;141:9; 142:11;166:14,19,23; 168:15;169:18;253:24; 254:2,3 3-10 (2) 154:23,25 3-11 (4) 152:2;154:23,25;155:9 3-12 (8) 154:19;155:22;156:2,5; 158:6;159:10,11;170:2 3-13 (1) 157:17 314 (2) 77:17;104:10 3-14 (1) 158:16 316 (1) 120:8 3-16 (1) 165:2 3-18 (1) 150:2 3-19 (7) 150:2;156:3;158:6;159:10, 11,16;161:25 31st (1) 15:21 3-2 (5) 142:8,9;166:14;172:10,13 322 (3) 120:17,18,20 326 (2) 120:12,15 327 (1) 120:16 3-3 (2) 144:9;145:22 332 (4) 30:3;48:16,22,23 334 (4) 35:20;48:25;49:16,18 337 (4) 53:13;69:7,16,17 338 (5)	44:21;47:2;48:10,12; 102:18 3-4 (6) 149:25;150:2,8,12,13; 152:6 347 (4) 115:5,24;116:2,16 347A (15) 116:3,5,16;117:12;118:3, 12,16,16;121:25;124:2; 125:17,19;139:4;149:19; 216:15 35 (1) 76:16 3-5 (4) 152:2,25;153:1;155:8 36 (5) 38:20,22,24,24;40:5 3-6 (1) 154:2 362 (3) 60:8,9,14 363 (6) 60:6,16,18;68:22;69:1,5 364 (5) 65:11,13;68:22;69:1,5 365 (8) 193:25;194:1,7,8,11,12,14; 240:25 38,000 (1) 72:14 3a (1) 81:24 3rd (1) 31:14
	3		4
			4 (4) 63:18;118:21;170:5,18 4,000 (1) 16:17 40 (7) 67:21;128:2,4;129:16; 162:24;190:17;230:25 400 (4) 9:3;10:2;12:8;29:25 400-acre (1) 29:22 40-acre (3) 41:21;67:25;68:1 45-14537 (1) 59:23 4th (1) 31:16
			5
			5 (25) 31:21;53:25;54:1;60:24; 86:4,15,18;157:6;159:18; 161:18;162:11;164:15,17; 165:4,4,10;167:2;169:2,23;

<p>170:7,8,9,21;193:8;237:16 5,000 (1) 129:17 5,600 (1) 127:2 5,666 (1) 127:1 5.8 (4) 41:7,13,22;223:14 5:00 (3) 96:18;97:18;255:10 5:03 (1) 256:21 50 (4) 29:14;92:7;165:14;190:17 50,000 (1) 152:13 57 (3) 55:5,6;57:1 57,000 (1) 218:7</p>	<p>75,200 (4) 35:9;74:25;189:2,14 75th (11) 164:22,23;165:11;166:7, 12,12,13;170:7,10;173:5; 243:5 76,000 (1) 74:14 781 (1) 162:8 7-ish (1) 44:20</p>		
6	8		
<p>6 (4) 39:9;44:20;124:10;230:8 6/'8/'12 (15) 126:23,25;127:5,12,17,18, 22,25;128:12,19,20;129:6, 14;130:12;230:14 60 (4) 29:14;90:19;92:7;166:8 600 (1) 90:1 618,000 (2) 217:22;218:3 65 (1) 166:8 65,000 (1) 152:14</p>	<p>8 (1) 71:17 80 (2) 67:21;166:10 800 (1) 67:24 86 (1) 158:17</p>		
7	9		
<p>7 (11) 34:19;55:8,12;57:1;103:7; 124:10,13;230:8;232:19; 234:24;237:16 7:00 (1) 16:20 7:30 (1) 16:20 700,000 (2) 184:23;185:5 73,000 (1) 101:8 75 (5) 31:3,5;82:18;138:10; 166:10 75,000 (18) 184:16,16;185:1,6,16; 190:8,11,15,16,18,22,25; 191:4;204:25;209:16,20; 210:23;211:12</p>	<p>9 (2) 84:10,15 9,000-some (1) 207:3 9:00 (2) 255:22;256:19 90,000 (1) 223:9 90s (1) 187:8</p>		

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO

IN THE MATTER OF DISTRIBUTION OF) DOCKET NO.
WATER TO VARIOUS WATER RIGHTS) CM-DC-2010-001
HELD BY OR FOR THE BENEFIT OF A&B)
IRRIGATION DISTRICT, AMERICAN)
FALLS RESERVOIR DISTRICT #2,)
BURLEY IRRIGATION DISTRICT,)
MILNER IRRIGATION DISTRICT,)
MINIDOKA IRRIGATION DISTRICT,)
NORTH SIDE CANAL COMPANY, AND)
TWIN FALLS CANAL COMPANY)
_____)

BEFORE

HEARING OFFICER: GARY SPACKMAN

VOLUME III

Date: June 8, 2023, 9:02 a.m.
Location: Idaho Department of Water Resources
322 East Front Street, 6th Floor

REPORTED BY:
ANDREA L. CHECK, CSR No. 748, RPR, CRR
Notary Public

A P P E A R A N C E S

1
2
3 For the Idaho Department of Water Resources:

4 Office of the Attorney General

5 Idaho Department of Water Resources

6 BY MR. PETER A. WOOD, ESQ.

7 322 East Front Street, Suite 648

8 Boise, Idaho 83720-0098

9 pete.wood@idwr.idaho.gov

10 For the City of Pocatello:

11 Somach Simmons & Dunn, P.C.

12 BY MS. SARAH A. KLAHN, ESQ.

13 & MR. MAXIMILIAN C. BRICKER, ESQ.

14 1155 Canyon Boulevard, Suite 110

15 Boulder, Colorado 80302

16 sklahn@somachlaw.com

17 For the Cities of Bliss, Burley, Carey, Declo, Dietrich,

18 Gooding, Hazelton, Heyburn, Jerome, Paul, Richfield,

19 Rupert, Shoshone, and Wendell:

20 McHugh Bromley, PLLC

21 BY MR. CHRIS M. BROMLEY, ESQ.

22 & MS. CANDICE M. MCHUGH, ESQ.

23 380 South 4th Street, Suite 103

24 Boise, Idaho 83702

25 cmchugh@mchughbromley.com

A P P E A R A N C E S (Continued)

For the Surface Water Coalition, Twin Falls Canal
Company, North Side Canal Company, and Milner Irrigation
District, A&B, Burley Irrigation District:

Marten Law

BY MR. JOHN K. SIMPSON, ESQ.

& MR. TRAVIS L. THOMPSON, ESQ.

101 South Capitol Boulevard, Suite 305

Boise, Idaho 83702

jsimpson@martenlaw.com

tthompson@martenlaw.com

For the Minidoka Irrigation District, AFRD#2:

Fletcher Law Office

BY MR. W. KENT FLETCHER, ESQ.

1200 Overland Avenue

Burley, Idaho 83318-0248

wkf@pmt.org

For the City of Idaho Falls:

Holden, Kidwell, Hahn & Crapo

BY MR. ROBERT L. HARRIS, ESQ.

1000 Riverwalk Drive, Suite 200

P.O. Box 50130

Idaho Falls, ID 83405

rharris@holdenlegal.com

A P P E A R A N C E S (Continued)

For Idaho Ground Water Appropriators, Inc.:

Racine Olson, PLLP

BY MR. THOMAS J. BUDGE, ESQ.

& MS. ELISHEVA M. PATTERSON, ESQ.

201 East Center Street

Pocatello, Idaho 83201

tj@racineolson.com

elisheva@racineolson.com

For Madison Ground Water District, Henry's Fork Ground
Water District, Jefferson Clark Ground Water District:

Rigby, Andrus & Rigby Law, PLLC

BY MR. JERRY R. RIGBY, ESQ.

25 North 2nd East

Rexburg, Idaho 83440

jrigby@rex-law.com

For Bonneville-Jefferson Ground Water District:

Olsen Taggart, PLLC

BY MR. SKYLER C. JOHNS, ESQ.

P.O. Box 3005

Idaho Falls, Idaho 83403

sjohns@olsentaggart.com

A P P E A R A N C E S (Continued)

For Bingham Ground Water District:

Dylan Anderson Law

BY MR. DYLAN K. ANDERSON, ESQ.

P.O. Box 35

Rexburg, Idaho 83440

dylan@dylanandersonlaw.com

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

W I T N E S S E S

1		
2		
3		
4	TESTIMONY OF SOPHIA SIGSTEDT	PAGE
5	Direct Examination by Ms. Patterson	11
6	Direct Examination by Ms. McHugh	87
7	Cross-Examination by Mr. Simpson	89
8	Cross-Examination by Mr. Fletcher	112
9	Cross-Examination by Ms. Patterson	117
10	Examination by the Hearing Officer	119
11		
12	TESTIMONY OF RICHARD LYNN CARLQUIST	
13	Direct Examination by Mr. Budge	122
14	Cross-Examination by Mr. Fletcher	132
15	Cross-Examination by Mr. Simpson	140
16	Redirect Examination by Mr. Budge	144
17		
18	TESTIMONY OF BRYCE CONTOR	
19	Direct Examination by Mr. Johns	150
20	Cross-Examination by Mr. Harris	207
21	Cross-Examination by Mr. Thompson	211
22	Redirect Examination by Mr. Johns	227
23		
24		
25		

I N D E X

W I T N E S S E S (Continued)

1		
2		
3		
4	TESTIMONY OF ANTHONY OLENICHAK	
5	Direct Examination by Mr. Harris	228
6	Direct Examination by Mr. Budge	237
7	Cross-Examination by Mr. Thompson	244
8	Cross-Examination by Mr. Fletcher	253
9	Cross-Examination by Ms. McHugh	258
10	Redirect Examination by Mr. Harris	261
11	Recross-Examination by Mr. Fletcher	263
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		

I N D E X
E X H I B I T S

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

NO.	MARKED	RECEIVED
SWC		
8 -	246	252
IDAHO FALLS, POCATELLO, AND COALITION OF CITIES		
366 -	227	236
BONNEVILLE-JEFFERSON GROUND WATER DISTRICT		
500 -	***	206
IGWA		
829 -	***	149
837 -	***	87

P R O C E E D I N G S

1
2
3 HEARING OFFICER: Okay. It's 9:00 a.m.
4 June 8th, and we're ready to start.

5 Are we on the record, Andrea?

6 COURT REPORTER: Yes.

7 HEARING OFFICER: Microphones are on.

8 Sarah, can you hear us?

9 Sarah is there, her image is there, anyways.
10 Maybe she just logged in.

11 Okay. Do we have Candice McHugh today?

12 MS. KLAHN: She will join us later. She's at
13 a meeting with one of her clients getting ready for the
14 testimony tomorrow.

15 HEARING OFFICER: All right, good. Are there
16 any preliminary matters that need to be addressed this
17 morning? If not, I think the witness that's --

18 MR. WOOD: Should we see if these guys can
19 hear us?

20 HEARING OFFICER: Yeah. Is Garrick Baxter on?

21 MR. BAXTER: I'm here, Director.

22 HEARING OFFICER: You can hear us?

23 MR. BAXTER: Yes, we can hear you fine.

24 HEARING OFFICER: Great. All right. Thanks.

25 I think the next witness is Sophia Sigstedt;

1 is that correct?

2 MS. PATTERSON: That is correct, Director.

3 HEARING OFFICER: And who will be examining?

4 MS. PATTERSON: Elisheva Patterson on behalf
5 of IGWA will be.

6 HEARING OFFICER: Good. Ms. Patterson, if you
7 will come forward, please, and find one of the
8 microphones.

9 And, Sophia, I see that you are online and
10 participating remotely.

11 THE WITNESS: Yes, thank you.

12 HEARING OFFICER: So I hope this examination
13 can proceed in a way that's meaningful.

14 Okay. I guess I need to swear you in from a
15 distance, Sophia, so if you'll raise your right hand.

16
17 SOPHIA SIGSTEDT, PH-GW,
18 called by IGWA having been first duly sworn to tell the
19 truth relating to said cause, testified remotely as
20 follows:

21
22 HEARING OFFICER: Thank you.

23 All right. Ms. Patterson.

24 MS. PATTERSON: Thank you, Director.

25 ///

DIRECT EXAMINATION

QUESTIONS BY MS. PATTERSON:

Q. Good morning, Ms. Sigstedt. May I call you "Sophia" today?

A. Yes, that's fine.

Q. Thank you.

Can you please give the court your name and your business address.

A. Oh, gosh. Yes, my name is Sophia Sigstedt. And the business address is -- sorry, just give me a second.

Q. Just the business is fine.

A. Okay. Lynker in Boulder, Colorado.

Q. Thank you.

And, quickly, can you tell me what your educational background is.

A. Yes. I have a bachelor's degree in environmental science from the New Mexico Institute of Mining and Technology and a master's degree in hydrology, also from New Mexico Institute of Mining and Technology.

Q. And how long have you been with Lynker?

A. I've been with Lynker since 2015, so about eight years. But I've been consulting since 2010, so a little over ten years.

1 Q. And how long have you been familiar with
2 the -- this project, the Eastern Snake Plain Aquifer?

3 A. I started working for IGWA around 2012, 2013,
4 so about ten years I've been working on the Eastern
5 Snake Plain Aquifer.

6 Q. And what type of work do you do for IGWA?

7 A. I started with IGWA during the Rangen
8 litigation. So I did a lot of modeling, water right
9 support related to that matter. I've done some witness
10 testimony also related to water right transfer in a
11 mitigation matter for the Rangen case. I've done a lot
12 of groundwater modeling, looking at IGWA's various
13 mitigation activities around CREP, recharge, water
14 conservation, modeling those activities as part of a
15 mitigation plan. I've done modeling for settlement
16 agreements around water conservation. For IGWA, I
17 participate on a number of technical working groups like
18 the --

19 Q. Yes, thank you.

20 So you've worked since 2012 -- was that the
21 date? -- 2012, 2013 on -- with IGWA?

22 A. Yes, that's right.

23 Q. So you're familiar with this project?

24 A. Yes.

25 Q. You mentioned briefly that you work on

1 other -- or not other consulting projects -- strike
2 that, please.

3 Can you tell me about the other committees
4 that you mentioned. Is there an aquifer modeling
5 committee that you are on and participate on?

6 A. Yes. So I'm a member of the Eastern Snake
7 Plain Hydrologic Modeling Committee, which does
8 technical advisory and oversight of Eastern Snake Plain
9 hydrologic model or ESPAM. I also participate in the
10 Big Lost Modeling Technical Advisory Committee.

11 Q. Okay. Thank you. I'm going to move to what
12 you did on this case.

13 What were you asked to do here in preparation
14 for this hearing?

15 A. I was asked to review the Fifth Methodology
16 Order, the April As-Applied Order, and the various
17 expert reports that were submitted in this matter.

18 Q. Thank you.

19 As a part of this hearing, did you also
20 participate in technical working groups held by the
21 Department staff in 2022?

22 A. Yes. I was part of the -- all of the meetings
23 for the 2022 technical working group, and I was also
24 part of the 2015 technical working group in this matter.

25 Q. Thank you.

1 And did you submit comments to the Department
2 on each of the 2015 technical working group and the 2022
3 technical working group?

4 A. Yes, I did.

5 Q. Did you submit an expert report in this case?

6 A. Yes, I did.

7 Q. And we have identified that as Exhibit 837.

8 Do you have a copy of that with you?

9 A. I do.

10 Q. Wonderful. So we will be going over your
11 expert report today.

12 We have also discussed your written comments
13 that you made to the staff in 2015. Those are
14 identified as Exhibit 103. We will be referring to
15 those during your testimony today.

16 And then your 2022 comments are identified as
17 Exhibit 916.

18 A. I have all of those.

19 Q. And you have copies of those available to you?

20 A. Yes.

21 Q. Thank you.

22 On this expert report and on your analysis of
23 the Fifth Methodology Order and the As-Applied Order,
24 were you able to perform all of the work you wanted to
25 do?

1 A. No, there is a number of things that -- sort
2 of outlined throughout the report that I didn't have
3 time to accomplish. And I think I submitted some other
4 documents to the court related to kind of further
5 analysis around irrigated acres. I would have liked to
6 have done some modeling to evaluate As-Applied Order
7 models that's detailed in the report. I think
8 reasonable carryover is something that I didn't have
9 very much time to analyze in this report; that's
10 something that I would have liked to have spent more
11 time on. Project efficiencies --

12 Q. It's kind of hard for you to see me, but I'll
13 try to interrupt you if -- we will address, you know,
14 these matters in more detail as we go through your
15 report, but suffice it to say there were more things
16 that you would have liked to do if you had time in
17 assessing the Fifth Methodology Order and the As-Applied
18 Order?

19 A. Yes. There are a huge number of components to
20 this methodology, and that was a very compressed time
21 frame to put together this report and analysis.

22 Q. Okay. Thank you.

23 And were there other matters that IGWA had
24 asked you to work on that, you know, this analysis
25 pulled you off of?

1 A. Yes. We're doing -- I'm doing some workaround
2 looking at how -- approaches to a groundwater management
3 plan, I'm working on recharge analysis, several things
4 that could have been done -- that should have been done
5 in this time.

6 Q. Okay. Thank you.

7 Let's turn to your report now and discuss what
8 you mentioned, the irrigated acreage issue. And can we
9 look at Table 2-1, which is a summary of the SWC
10 irrigated acres 2015, TWG.

11 A. Okay.

12 HEARING OFFICER: So, Ms. Patterson, this is
13 Exhibit 837 in the common exhibits?

14 MS. PATTERSON: This would be under IGWA's
15 exhibits.

16 MR. WOOD: What number again?

17 MS. PATTERSON: 837. It should be the last
18 binder.

19 MR. WOOD: 837?

20 MR. BUDGE: Director, can we go off the record
21 just for a moment just to address a logistical matter?

22 HEARING OFFICER: Yes.

23 (Break taken.)

24 HEARING OFFICER: Back on the record. We're
25 recording again. Microphones are on.

1 Ms. Patterson?

2 MS. PATTERSON: Thank you.

3 Q. (BY MS. PATTERSON) Sophia, can you see me a
4 little better now?

5 A. Yes, thank you.

6 Q. So I previously asked you to turn to your
7 report, which is Exhibit 837, and then on page 8, there
8 is a Table 2-1.

9 Can you please tell us again what the 2015 TWG
10 refers to?

11 A. Yes. So in 2015, I think, there was an order
12 that directed Department staff to convene a technical
13 working group around a number of issues. One of the
14 issues that was discussed was improvement to the
15 reasonable in-season demand. And part of that was
16 looking at irrigated acres.

17 This table that you're referring to is
18 basically a summary of irrigated acres presented to the
19 technical working group related to their reasonable
20 in-season demand calculation.

21 Q. Okay. And then in your report, two paragraphs
22 above the second sentence, it reads: "It was my
23 understanding that in 2015 that these would be the
24 irrigated acres used in the Methodology Order. However,
25 my recent review of the Department's RISD calculation

1 spreadsheet indicates that these acres were only applied
2 to calculations 2000 to 2014."

3 Can you explain that comment for us?

4 A. So I'm referring to the very last column in
5 the Table 2.1 that you referred to that's labeled, and
6 this is the Department staff's labeling, "2013
7 Reasonable In-Season Demand." So in that column,
8 there's sort of a conglomeration of the different
9 irrigated acres presented in the table where they're
10 either taking what's from the partial decree irrigated
11 acres, or it seems like they're using the 2005-2007 SPF
12 acres, which I think have been mentioned in testimony
13 represented in previous proceedings.

14 And so it was my understanding that the
15 last -- the acres in that last column were being used in
16 the reasonable in-season demand. They provided a
17 spreadsheet of the reasonable in-season demand
18 calculation in 2015, and these were the irrigated acres
19 used in the calculation sheet at that time.

20 When I referred to they were only used through
21 2014 is that for this proceeding, we were given an
22 updated spreadsheet, something like that reasonable
23 in-season demand through 2022, and that includes a
24 hindcast, basically, from -- you know, the order wasn't
25 implemented until I think 2010, but that includes a

1 hindcast of reasonable in-season calculations starting
2 in 2000. And what I see in that sheet was that these
3 irrigated acres in this column were used in the
4 reasonable in-season demand from 2000 to 2014.

5 Q. So you identified some of the columns here.
6 Am I to understand the 2013 RISD column of -- those were
7 used in the hindcast, which means that they were used in
8 the As-Applied Order to calculate RISD in 2000 to 2014?

9 A. Like I said, I think the As-Applied Order
10 really only goes through 2010, but, yes, I think these
11 were the irrigated acres used in the calculation during
12 that time.

13 Q. Okay. And then you mentioned, you know, that
14 second column from the right, "2005-2007 SPF."

15 Do I understand -- is that the Spronk
16 engineering inputs?

17 A. Yes.

18 Q. And so, for example, Burley, it looks like
19 that's 44,715, and then in column -- on the far left,
20 that same number is used for the 2013 RISD?

21 A. Correct.

22 Q. And similar for Minidoka and Twin Falls Canal
23 Company?

24 A. That's correct.

25 Q. Thank you.

1 Let's move next to Table 2-2, which is on
2 page 9. Can you explain to me what this is?

3 A. Yes. So this is the table extracted directly
4 out of the reasonable in-season demand calculation
5 sheet. You can see this in both the version provided to
6 the technical working group dated 2014, and you can see
7 this same table in the reasonable in-season demand
8 calculation sheet provided to the technical working
9 group in 2022 -- or it was -- yeah, 2022.

10 And, essentially, you can see that this is --
11 these are the data cells used for irrigated acres in the
12 reasonable in-season demand calculation, like I said,
13 2000 through 2014.

14 Q. And what is significant about the Twin Falls
15 Canal Company acreage?

16 A. So you can see, like the table that we
17 referred to previously, they're implementing the SPF,
18 the Spronk water irrigated acre numbers there. They're
19 referencing an exhibit I think that was used in the
20 proceeding to, basically, accept these acres to be used
21 in the reasonable in-season demand calculation.

22 Q. Thank you.

23 Did the Department staff tell the 2015
24 technical working group that they were planning to
25 change the acreage that was used to calculate RISD that

1 was shown in Table 2-1?

2 A. I don't recall that, and I went through the
3 staff recommendations which were very detailed in terms
4 of what they were recommending to change, and there was
5 nothing about changing the number of irrigated acres
6 that they were going to be applying in the reasonable
7 in-season demand calculation.

8 Q. Thank you.

9 Let's go to that memo, which is actually an
10 attachment to your report, but it is also Exhibit 103.
11 If we want to stay on the report, we can just look at
12 page 50.

13 Sophia, do you have in front of you that staff
14 report that is from Liz Cresto and Matt Anders to Gary
15 Spackman dated March 16th, 2015?

16 A. I do.

17 Q. And do you recognize this?

18 A. Yes.

19 Q. Can you explain to me what this is?

20 A. Yeah. So I think at the conclusion of the
21 series of technical working group meetings in 2015, the
22 staff was, basically, describing the recommendations
23 that they were going to have if they were recommending
24 to have implemented in the methodology. And then they
25 also describe, I think, pieces of improvements to

1 reasonable in-season demand and others that they didn't
2 have time to, basically, do analysis and address to make
3 a recommendation on.

4 Q. Thank you. And then if we turn to page 55 of
5 your report, which, again, is -- we're still looking at
6 that memo from Liz Cresto. It says down at the bottom
7 that -- the last paragraph summarizes the work on the
8 mid-season forecast demand.

9 It reads: "With the limited time frame the
10 committee was given, we were unable to conclude an
11 analysis of methods to improve RISD forecasts. Because
12 this analysis was not yet complete, we cannot currently
13 recommend changes to the current methodology regarding
14 this issue."

15 Do you recall why there was a limited time
16 frame?

17 A. I do not, but I definitely do remember the
18 staff talking about being under a compressed time frame
19 during the period that they had to do the analysis.

20 Q. Do you know whether the technical working
21 group or Department staff has completed this analysis
22 since 2015?

23 A. I think the things that she lays out here and
24 that I recall from the presentations to the technical
25 working group were, she was looking at alternative

1 possibilities for basically forecasting the remainder of
2 the irrigation season and the reasonable in-season
3 demand calculation, so opposes the current methodology
4 that uses the baseline year to come up with volumes for
5 the months that haven't occurred. She was also looking
6 at supplemental groundwater use and reevaluating the
7 project efficiency methods.

8 To my knowledge, none of that analysis was
9 carried on past this point or further.

10 Q. Thank you.

11 If you go down to page 56, I believe that's
12 where supplemental groundwater use is discussed, so
13 under Section 4, paragraph 2, sub (b), it says:
14 "Supplemental groundwater use. There was insufficient
15 time for the committee to evaluate this subject."

16 Does that match what you recall?

17 A. Yes.

18 HEARING OFFICER: Ms. Sigstedt, could you tell
19 me which exhibit that you are referring to at the
20 present time?

21 THE WITNESS: I'm looking at the last page of
22 the 2015 Department staff recommendations.

23 HEARING OFFICER: So, Ms. Patterson, I'm
24 sorry, that would be 103?

25 MS. PATTERSON: So it is contained in 103. If

1 you want to refer to it there, it would be the last page
2 of that one. But it is also an attachment to
3 Ms. Sigstedt's expert report. And if you're looking at
4 the expert report, which is 837, it will be on page 56.

5 HEARING OFFICER: Okay. I now am on page 56
6 of Exhibit 837. Okay. Thank you.

7 MR. WOOD: I don't think that's correct.

8 MR. FLETCHER: It says: "Future committee
9 meetings."

10 HEARING OFFICER: Yeah, it's titled, "Future
11 Committee Meetings," Section 4.

12 MR. WOOD: Oh, that's right.

13 MS. PATTERSON: Yeah, that's right.

14 MR. WOOD: Okay. That's fine. Sorry.

15 HEARING OFFICER: Go ahead.

16 MS. PATTERSON: Sorry, there's a lot of paper.

17 MR. WOOD: Yeah.

18 Q. (BY MS. PATTERSON) Sorry, I'll just go back.

19 So as you recognized or just testified about
20 before, the technical working group in 2015 did not have
21 time to address the supplemental groundwater use, and is
22 that reflected in the report on page 56?

23 A. That's right. And you can see right above
24 that, the Department staff is also recommending that
25 they would have liked to continue this work in future

1 meetings. I think they recommend something like one
2 meeting a year or something. And that -- that has not
3 taken place. I don't think that recommendation was
4 taken up.

5 Q. Thank you.

6 Section D also identifies future work.
7 Irrigated acres, it says: "Significant discussion
8 focused on this topic. And it was generally agreed that
9 the processing for determining irrigated acres for SWC
10 members could not be improved."

11 Do you recall that discussion?

12 A. Yes. I think discussion around irrigated
13 acres was -- had to do with the submittals by the
14 Surface Water Coalition, whether they were updated and
15 whether the Department had a process in place to,
16 basically, evaluate what the Surface Water Coalition
17 submitted.

18 Q. Thank you.

19 Let's move on to page 66 of your report, which
20 are your comments in 2015 in response to the Liz Cresto
21 report.

22 Is that correct?

23 A. I'm sorry, I have a different page number.

24 Okay.

25 Q. So can you just describe this document?

1 HEARING OFFICER: So what document are we
2 looking at now?

3 MS. PATTERSON: If you stay on the current
4 exhibit that you are on, 837, and if you go to page 66.

5 HEARING OFFICER: Okay.

6 THE WITNESS: So following the recommendation
7 comments from Department staff in 2015, they gave an
8 opportunity to the technical working group members to
9 provide their own comments that would be attached to
10 their comments, which is what you see. These are my
11 comments related to what they recommended.

12 Q. (BY MS. PATTERSON) And just so we're clear
13 that we're all looking at the same document, is this the
14 one dated March 16th, 2015?

15 A. That's what I'm looking at.

16 Q. Perfect. Okay. On page 68, the last two
17 paragraphs refer to "irrigated acres."

18 Are these comments referred to in your current
19 report?

20 A. Yes.

21 Q. Can you explain to the Court what your
22 comments are here?

23 A. So what we heard from the technical working
24 group on irrigated acres was that there was not a
25 process in place for the Department to basically

1 evaluate a submittal, aside from overlapping -- removing
2 overlapping acres, I think, from those shapefiles.

3 So my comments here have to do with
4 recommending that they're -- they do put in a review
5 process around irrigated acres submitted that includes
6 identifying hardened acres using either aerial imagery
7 or remote sensing data, which was presented as being
8 available to the Department to use for this type of
9 analysis.

10 So I lay out kind of the things that they
11 should -- a process around things that should be
12 removed, like roads and surfaces, things like that. And
13 then I also have a comment here that I, essentially,
14 disagree with using the 5 percent standard as the
15 Surface Water Coalition's being able to, essentially,
16 say that as long as they haven't changed their acreage
17 within 5 percent -- this has to do with something we
18 heard, I think in testimony earlier -- that for a very
19 large irrigation district like Twin Falls Canal Company,
20 5 percent of that irrigated acres can be something like
21 10,000 acres and that can, you know, add up to some tens
22 of thousands of acre-feet in terms of crop water need.

23 Q. Potentially erroneous crop water need?

24 A. Exactly. An erroneous calculation of crop
25 water need that would fall into the demand shortfall

1 calculation.

2 Q. Do you know if the Department has done
3 anything to improve the process?

4 A. No. I think based on the information that we
5 represented in the 2022 technical working group, not
6 only have they not implemented their own review process,
7 for whatever reason, it seems like they have reverted
8 back to using more outdated irrigated acres than were
9 presented to us in this 2015 technical working group,
10 which took into account, basically, the nonirrigated
11 acres that had previously been identified and presented
12 to the Court for various irrigation entities.

13 Q. Okay. Thank you.

14 Let's go back to the body of your report. So
15 we're still on Exhibit 837, but we'll be going to
16 page 10. And we're looking at Table 2-3, Summary of SWC
17 Irrigated Acres 2022, TWG.

18 Can you just explain again what the 2022 TWG
19 is?

20 A. So again, by order, the Department staff were
21 directed to convene a technical working group. This is
22 the first one since that 2015 technical working group.
23 There was a series of meetings held as part of meetings
24 around looking at the implementation of what's called
25 near real-time METRIC data, and they presented

1 information on irrigated acres.

2 This table is a summary of the various
3 datasets for irrigated acres that were presented to the
4 technical working group committee in 2022.

5 Q. Okay. So this came from a presentation that
6 was given by the Department in the 2022 technical
7 working group?

8 A. Correct.

9 Q. Thank you. So what does this show, this
10 table?

11 A. So this shows -- it starts with a column
12 called "Shapefile Acres." These are either from the
13 permitted place of use, PPU, with a date; acres
14 recorded; or sometimes there's a shapefile that has been
15 submitted by Surface Water Coalition following that
16 date, so it has -- that would be designated by SWC with
17 the date that that shapefile was committed and the
18 associated acres. That's the first column.

19 The second column, and these are the
20 Department's labeling, is "If Removed Non-irrigated
21 Acres Using the 2011 Irrigated Lands Dataset." So these
22 report the acres for the districts from using the
23 Departments irrigated land dataset.

24 The same thing is in the next column but is
25 the updated irrigated lands for 2017.

1 And then, like I said, this presentation, I
2 think, was focused around the implementation of near
3 real-time METRIC, and so they have a column labeled
4 "Near Real-Time METRIC Processing Acres" that was done
5 in 2021.

6 And then the last column is, essentially, the
7 acres that are used in the Methodology Order. And like
8 I said, I reviewed the reasonable in-season demand
9 calculation sheet for the Methodology Order and
10 following -- starting in 2015, the very last column
11 here, are the acres used in every year for the
12 reasonable in-season demand calculation.

13 Q. Thank you. If we go to page 11 of your
14 report, the first paragraph has a sentence that reads:
15 "Every technical analysis of the irrigated acres
16 consistently shows that Twin Falls Canal Company is
17 irrigated approximately 15,000 acres less than the" 19
18 -- or "194,732 acre figure that Twin Falls Canal Company
19 reports to IDWR as being irrigated."

20 And then there's references to the SPF report
21 from 2008 and the IDWR irrigated lands dataset in 2011
22 and 2017, and then the NRT METRIC data for 2021.

23 Can you explain to me, you know, how those
24 different references helped you form that conclusion?

25 A. I mean, you can see it in the table we were

1 just referring to, Table 2-3. Each of those datasets
2 that is -- has, basically, an actual analysis. What the
3 irrigated lands, the actual irrigated lands are at that
4 time shows that it's about 15,000 acre-feet less than
5 the irrigated acres that's being used for Twin Falls.

6 You know, this is confusing, because I think
7 in the same presentation, Matt Anders makes very clear
8 that in the Department methodology nonirrigated acres
9 are not supposed to be included in the reasonable
10 in-season demand calculation, and, essentially, they're
11 showing consistently data that shows that those
12 nonirrigated acres are being used.

13 Q. Thank you. Can you explain to us the IDWR
14 irrigated lands dataset, as you understand it?

15 A. Yes. As I understand it, this was something
16 that was, I think, originally commissioned for Eastern
17 Snake Plain Hydrologic -- or at the direction, maybe, at
18 the Eastern Snake Plain Hydrologic Modeling Committee.
19 They used this dataset in the calibration of the model,
20 and the year that it is available, they use that as the
21 irrigated acres, then they apply whatever method they're
22 using to calculate ET, or evapotranspiration, to come up
23 with a consumptive use volume associated with those
24 acres to be used in the model and the model calibration.

25 Q. So just to confirm, this irrigated lands

1 dataset, this was used in the model?

2 A. Correct. It's -- yep -- whatever years it's
3 available, it's used for those years until -- starting
4 in that year until the next most updated irrigated lands
5 dataset comes available.

6 And I think I list in my report there, I saw,
7 basically, some Department information, like a story map
8 or something, talking about these irrigated lands
9 dataset, and it looks like starting in, basically, 2008,
10 they've developed it for every year through 2017.

11 Q. Thank you.

12 On page 12, there's a figure labeled "2-1."
13 Can you explain this figure just briefly?

14 A. So this comes from a 2006 document about how
15 the irrigated lands dataset is created. I found this in
16 background material presented to the technical working
17 group in 2015, so I think it was made available to us
18 then in terms of understanding how the irrigated lands
19 dataset worked.

20 And, essentially, what you can see is they
21 start with remote sensing data of irrigated lands, which
22 is kind of the green box without any delineation s, and
23 they overlay that with a very detailed -- the most
24 detailed polygon area that they can find. It's called
25 the CLU, and it's, basically, designed to be the

1 smallest boundary that they can. So individual fields
2 owned by individual owners, just, basically, the most
3 discretized polygon acres that they can associate with
4 the various land designations.

5 COURT REPORTER: Ms. Sigstedt, hold on because
6 I missed a word.

7 (Record read by reporter.)

8 THE WITNESS: I think "discretized" is the
9 word I used.

10 COURT REPORTER: Okay. Thank you.

11 THE WITNESS: So they use the -- they use the
12 Landsat image to then assign those polygons as either
13 irrigated or nonirrigated. And then they take that
14 classification, and they mask it with, basically, aerial
15 imagery to identify where the developed acres are.

16 And we heard testimony earlier that this --
17 the IDWR irrigated lands dataset is basically classified
18 into three classes that includes irrigated,
19 semi-irrigated, and nonirrigated. And so they use the
20 aerial imagery to identify the semi-irrigated acres,
21 which in -- ultimately, this all resulted in the last
22 image that you see on the bottom right where the
23 irrigated acres are shown in green, the semi-irrigated
24 acres are shown in gray, and the nonirrigated acres are
25 shown in tan.

1 Q. (BY MS. PATTERSON) Thank you.

2 And you said that this dataset is available --
3 or has been used by the Department since 2008 through
4 present, or they at least have the dataset.

5 Can you clarify what that comment was?

6 A. I think they started this dataset around
7 2006 -- I'm not sure exactly when they started -- and
8 they did some prior years like, maybe, 1986, 1996,
9 2000 [sic]. But my comment was that, at least based on
10 the information -- I haven't checked the archived data
11 to verify this, but based on information from the
12 Department, it looked like starting in 2008 this dataset
13 is available every year through 2017.

14 And they continually update it every year for
15 the model. Like right now, they're estimating that the
16 2021 dataset will come out next year, I think. And it
17 just takes them a while to process. It's a very
18 detailed dataset that is well done, and so it takes them
19 a while to process it.

20 Q. Thank you. The next section of your report
21 discusses IDWR METRIC dataset.

22 Can you explain your understanding of this?

23 A. Yes. So, also, I think for the ESPAM model
24 development, they started working with -- I think the
25 University of Idaho, basically, under a grant to come up

1 with an alternative method to using the ET data just
2 measured at point sources from weather stations to
3 coming up with mapped evapotranspiration data across the
4 entire Snake Plain that they could use for their
5 consumptive use in the model. And so, again, they went
6 back for -- they have some years like 1986, 1996, 2006,
7 but they started developing, as often as they could, a
8 METRIC dataset to be used in the model for ET.

9 Q. Thank you.

10 And so Figure 2-2, on page 13, is that an
11 example of the METRIC ET?

12 A. Yes. So here, you can see the model boundary
13 on the left figure, and then the -- where that METRIC
14 data covers in terms of just the images that come out
15 from the METRIC analysis. And then there's kind of a
16 zoomed-in picture to show you how detailed this METRIC
17 is in terms of they can apply it on a field-by-field
18 basis for coming up with an evapotranspiration rate.

19 Q. Thank you.

20 And then on page 13, you have a section on
21 your conclusions. Can you just briefly explain your
22 conclusions based off of all these different technical
23 working groups and the work that you've done?

24 A. Yeah. So I think based on the information
25 that I understand that the Department has available to

1 them, they certainly have the capability to be updating
2 the irrigated lands that are used in the methodology to
3 be consistent with only applying nonirrigated -- or to
4 not apply nonirrigated acres and to only be using
5 irrigated acres. I think that the -- whatever is the
6 most up-to-date IDWR Landsat at a minimum should be used
7 to evaluate what the shapefiles that the Surface Water
8 Coalition submits in terms of irrigated acres.

9 I understand from the Department staff
10 testimony that they would like that to be available
11 every single year. I think that there are a number of
12 components in the methodology that aren't available in
13 real time, the crop links which is also used in the
14 reasonable in-season demand isn't, and so I think using
15 whatever is the most up-to-date dataset makes sense.

16 I think if they wanted to have the most
17 real-time picture, it seems like they should be able to
18 use the METRIC information that is -- potentially is
19 available to them in-season, and they could use that to
20 identify within the information that they already have
21 what is being irrigated and what is not being irrigated.

22 Q. Okay. Thank you. Let's move on to another
23 component of the reasonable in-season demand.

24 Can you talk about the baseline year and what
25 the selection criteria are, briefly.

1 A. Yes. So the baseline years is, essentially,
2 come up with a forecasted demand for the Surface Water
3 Coalition entities that can be used in April before the
4 season starts. It's meant to sort of balance -- be a
5 balance between providing adequate protection for the
6 senior surface water users without creating
7 unnecessary -- you know, creating a level of protection
8 against unnecessary curtailment of the juniors. There
9 is a series of baseline criteria, and these are meant to
10 account for three factors that are basically climate,
11 water supply, and the irrigation practice.

12 Q. And are there specific criteria, like within
13 the climate factor, for example, that the Department
14 considers?

15 A. Yes. So I think in my expert report, I show
16 the specific criteria being used for the baseline year,
17 and, essentially, to capture irrigation practices, they
18 only consider years post 2000 to make sure that current
19 irrigation practices are only considered in the
20 averages.

21 In terms of water demand or, you know, also
22 related to irrigation practices, they look at what the
23 total Surface Water Coalition diversions are. They also
24 look at what the supply is in terms of the highest
25 natural flow and then the storage allocations.

1 For the climate component, they look at what
2 the evapotranspiration is. They look at what the
3 growing degree days are, so, essentially, making sure
4 that they're evaluating a long season. And they look at
5 what the precipitation would be for the irrigation
6 season.

7 Q. And then in your report, you have Figures 2-3
8 to 2-7.

9 Are these figures pulled from the methodology
10 report?

11 A. That's right. And these figures show all of
12 those individual baseline criteria components, and then
13 they show what the average over the period is for these
14 components so that you can see that for the -- so that
15 you can see that they're meeting the baseline criteria
16 in terms of whether they're supposed to be above or
17 below average.

18 Q. Going to page 17 of your report. Can you
19 explain how the baseline year has evolved over the
20 different methodology orders?

21 A. Sure. So by my review, it seems like the
22 First Methodology Order laid out the first baseline year
23 to be used, and they, essentially, were using a period
24 of record from 2000 to 2008. Based on the selection
25 criteria, there's a statement in there that says, "'from

1 a standpoint of total annual SWC diversions, 2006 is an
2 appropriate baseline year with 97 percent of 2000 to
3 2008 total surface water diversions.'" "

4 That's a direct quote from the First
5 Methodology Order, but the Director found that it would
6 also be appropriate to use the values of 2006 and 2008,
7 so an average of those values, to arrive at the baseline
8 year. And the reasoning there was that it more strongly
9 fits the criteria for all of the members. And in the
10 '06 and '08 the average amounts to 100 percent of the
11 Surface Water Coalition's diversions over that period of
12 time.

13 If we move on to the Third Amended Final
14 Order, which was the next update to the baseline year,
15 the period of record that they're considering is 2000 to
16 2014. And the reason they needed to update the baseline
17 year was that the previous average being used no longer
18 met the baseline year criteria.

19 In that year, they had -- they considered 2012
20 as the baseline year. They decided that they did not
21 think that was an appropriate baseline year because it
22 was very extreme in terms of the average over some of
23 the baseline year criteria. Ultimately, they chose the
24 average, '06, '08, '12 for the baseline year criteria to
25 establish the baseline year in that methodology. That's

1 101 percent of the total Surface Water Coalition
2 diversions.

3 And then for the Fifth Methodology, which is
4 the next update to the baseline year, they again had an
5 extended period of record. So they're looking at 2000
6 to 2021 to evaluate those baseline year criterias.

7 The Department considered using 2018 or 2020
8 based on the review -- based on the information
9 presented to us in the 2022 technical working group
10 committee. They selected 2018 as the baseline year, and
11 that's 104 percent of the Surface Water Coalition total
12 diversion entities.

13 And I guess one thing that I note in terms of
14 how this evolution played out, is that I think the
15 difference between 104 percent and 1 percent of the
16 baseline year, in terms of the bias it creates, is,
17 essentially, looking at the difference between
18 32,000 acre-feet or 120,000 acre-feet, respectively, in
19 terms of protection for the senior surface water user in
20 terms of just sort of starting with how much demand you
21 want to start with in the evaluation.

22 And I think that that's a significant shift
23 from the previous baseline years that were all around
24 that 100 to 101 percent. And I think it's informative
25 that in the Third Methodology Order when they chose '06,

1 '12, '08 as the baseline year at 101 percent, they could
2 have chosen -- I'm just looking for it here in my notes.

3 Q. I think it was the '08-'12 average?

4 A. Yes. They could have chosen the '08-'12
5 average, which would have -- instead of being
6 101 percent of the surface water diversions at that
7 time, that would have been 104 percent of the diversions
8 at this time -- at that time. And they chose not to do
9 that. I think they chose a year closer to the
10 100 percent. They chose the 101 percent.

11 And I think that's because there's no need to
12 shift the baseline year to that higher percentage
13 because it's the accumulation of all the baseline year
14 criteria, themselves, that ensures that there's
15 above-average supply so that they can divert as much as
16 they want. It ensures that it's a hot and very long
17 growing season and in terms that there's minimal
18 precipitation. And then on top of that, in terms of the
19 demand shortfall, you already have a reduced forecast
20 supply based on conservatism that they had in that.

21 So all of that, arguably, amounts to, you
22 know, a very protective year in terms of what the senior
23 needs to balance out protection for them versus
24 curtailment of the junior.

25 Q. Thank you.

1 And just to summarize a couple of points, the
2 Department allowed averaging to create kind of a
3 synthetic baseline year in the past; is that correct?

4 A. Yes. In all of the previous orders, an
5 average was used to, basically, get as close as they
6 could to that 100 percent.

7 Q. Okay. Thank you.

8 Let's go now to your conclusions, which, you
9 know, if you've already kind of testified about some of
10 your conclusions, just please address on page 18 of your
11 report if there's anything else that you kind of
12 concluded from your analysis on the baseline year.

13 A. Yeah. So I think, you know, one thing you can
14 look at, Twin Falls in particular, and look at choosing
15 2018 as the baseline year, which has 106 percent of the
16 average Twin Falls, TFC, diversions, and that creates a
17 bias in their favor of starting with 60,000 acre-feet.
18 So that's almost the entire demand shortfall that was
19 calculated this year. And I think if you take into
20 account in addition what the methodology does to reduce
21 the supply, what we can see in a year like this is that
22 the entire demand shortfall is really based on just the
23 conservatism in this methodology.

24 So I think it's important that that
25 conservatism be balanced in some way when we talk about

1 60,000 acre-feet of shortfall being just the
2 conservatism, and we think about the new method of the
3 methodology, where the transient model is employed,
4 we're talking about already a very senior curtailment
5 date.

6 If we consider the curve that Jennifer Sukow
7 presented in terms of looking at demand shortfall under
8 the transient simulation and the -- what it generates
9 for shortfall under the transient simulation, a
10 60,000 acre-foot demand shortfall basically starts you
11 in around a 1961 curtailment date with over
12 500,000 acre-feet of groundwater curtailed. And so I
13 don't really see the balance there for protection
14 against curtailment for the junior.

15 Q. I want to direct you to page 20 of your
16 report. Up at the top of that first paragraph, you
17 state: "There were unique hydrologic circumstances in
18 2018 that I don't believe represent the typical dry
19 year."

20 Can you explain that a little bit?

21 A. So in addition to just shifting the total
22 demand for the Surface Water Coalition, the thing
23 they're pointing -- when you look at 2018, I think there
24 was a particularly good water supply outlook for that
25 year, and there was a lot of recharge done across the

1 Eastern Snake Plain Aquifer in that year. And it also
2 may have just lapsed water operations because the water
3 supply was predicted to be so good, and it didn't need
4 to be constrained.

5 And so a couple of things that I looked into
6 was whether all the recharge water was accounted for in
7 2018. And I don't know if we're going to get into this,
8 it might be later in my report, but what I see is that I
9 don't think that they have -- that the Department's
10 water allocation has accounted for all the recharge that
11 needed to be subtracted out of 2018 as a baseline year.

12 And then the other concern I have with 2018 as
13 a baseline year is if we look at the figures for the
14 baseline year criteria, what we see is that it's
15 particularly low in terms of the irrigation season
16 precipitation. It's the only year in the entire record
17 that doesn't have any July and September precipitation,
18 and its total precipitation is, basically, at one
19 standard deviation away from the average.

20 And when I look at previous orders on
21 selecting the baseline year, it seems like they're
22 choosing an average to get all of those baseline
23 criteria closer to average so that, you know, an
24 outlier-type year is not included as a baseline on its
25 own.

1 Q. Thank you.

2 And are some of those things you just
3 described, you know, about precipitation, are those
4 identified in Table 2-4 on page 19?

5 A. No -- well, yes. Yeah. You can see in
6 Table 2-4, what I'm laying out here are, essentially,
7 the numbers for the different baseline years considered
8 in this Fifth Methodology Order based on the technical
9 working group meeting. So that was 2020, 2018, and
10 they're comparing it to the average of the 2000-to-2021
11 period. And so, yes, you can see that precipitation is
12 particularly low compared to the average there.

13 And what I'm proposing in this table is that I
14 think the Department could have considered an average
15 for the baseline year criteria in the Fifth Methodology
16 Order, so I've included the average of '06 and 2018 to
17 show that that also meets all of the baseline year
18 criteria when you look at it compared to this current
19 period of record, but it's much -- but it's more
20 reasonable in terms of just being 101 percent of average
21 for total Surface Water Coalition diversions more
22 consistent with what's been chosen in previous orders.

23 Q. Okay. Thank you.

24 And in your January 16th, 2023, comments to
25 the technical working group, did you raise these issues?

1 A. Yes, I did.

2 Q. Thank you. Let's move next to forecast
3 supply.

4 What issues were identified at the 2015
5 technical working group meeting? Again, just briefly.

6 A. So I think, specifically, one of the reasons
7 -- and it was definitely something that the Department
8 put the most, it seemed like, time and analysis into --
9 was that the April forecast supply model for Twin Falls
10 Canal Company needed to be improved. And so they looked
11 at, basically, ways that they can improve that model.
12 Just because of the way that they did the analysis, they
13 evaluated the forecast supply models for all of the
14 different Surface Water Coalition entities, and in the
15 end they made a recommendation to change several of
16 them.

17 Q. Thank you. And then Table 2-5 on page 22, can
18 you just describe what that table shows.

19 A. So this is a list of all the different
20 predictors that the 2015 technical working group
21 considered at that time to improve the forecast supply
22 models, and then you can see in bold, in this table, are
23 the ones that actually got selected to be used in the
24 forecast supply models.

25 And so I think in total here, we're looking

1 at -- almost 30 different predictors that would be --

2 HEARING OFFICER: Just a moment. Just a
3 moment. We lost the audio. We need to back up.

4 Q. (BY MS. PATTERSON) Sophia, were you counting
5 out, or were you trying to say something when you were
6 doing that?

7 A. No. I'm sorry. That was just me counting in
8 my head. I'm sorry about that.

9 So I was just saying that, essentially, they
10 tested about 30 predictors to see which ones applied and
11 how they can improve the models at those times.

12 Q. And you were looking at Table 2-5 and just
13 counting out the different predictors that they
14 considered in 2015?

15 A. Just roughly, yes.

16 Q. Roughly, yeah. Thank you.

17 Moving on to the 2022 technical working group,
18 what was the regression models discussed there?

19 A. So we saw a presentation that basically showed
20 the Department's evaluation where -- you know, since
21 these models were developed in 2014, they're able to
22 look at how the regressions compare as they add new --
23 as they add each new year of data so they can show us
24 over the years how the regression models have performed.

25 And so that -- you know, that's one of the

1 analyses that they -- that's kind of the main analysis
2 that they showed us for the 2022 technical working
3 group.

4 Q. Let's go to Table 2-6 which is on page 22.

5 What does this table show?

6 A. So this is the table that I've created to,
7 basically, summarize -- from my understanding, it looked
8 like they did try and see if they could make
9 improvements to the forecast models. But this effort
10 seemed like it was done not in the same manner as the
11 2015 technical working group, which had a really
12 thorough and kind of prescribed approach to how -- to
13 the predictors that they did.

14 It seemed like here they, basically, tested
15 three new predictors. So the table that I'm showing
16 are, in bold, the predictors that are already used in
17 the model. And in this technical working group, they
18 tested a couple wells and then, basically, the
19 introduction of the Sentinel Well Index to see if those
20 improved the forecast models; and they found that they
21 did not, and so there was no recommendation to change
22 the forecast models.

23 Q. Okay. And then in your section on current
24 forecast supply predictor variables, can you explain
25 your concerns that you have presently?

1 A. Yeah. So I think these are concerns that the
2 Department had as well. It was part of their
3 presentation to us. And that's that they, basically,
4 showed us that for Twin Falls Canal Company in
5 particular, what they see is that the R-squared value
6 has been degrading over time to the point where -- and
7 the R-squared value is, basically -- you know, it
8 explains the predictive power for accuracy of the model,
9 so the percent of variabilities that's explained by your
10 forecast model.

11 And so it -- they see it degrading about
12 10 percent, and they see it consistently degrading every
13 single year that it's input. And so I think that's a
14 concern.

15 And I think we heard testimony that the
16 concern is, potentially, that that model includes
17 Box Canyon as a predictor. They talked about the shift
18 that's observed in Box Canyon. I think that's a
19 concern. When you look at just the water year summary
20 for Box Canyon, it also talks about it can be influenced
21 by irrigation return flows from Rimrock.

22 And then I have a concern for Box Canyon as a
23 predictor just because physically Box Canyon discharges
24 from a completely different reach of the Eastern Snake
25 Plain Aquifer, and, actually, when you look at kind of

1 historical discharge from the Kimberly to King Hill,
2 which is the reach that Box Canyon discharges to,
3 compared to the near Blackfoot to Minidoka reach, they
4 have different responses to, basically, changes in the
5 Eastern Snake Plain Aquifer over time.

6 And so to me, just logically, it's a
7 questionable predictor, and it's probably just
8 correlated with something else, and that's why it
9 doesn't perform very well in the model.

10 Q. Do you recall the testimony from Matt Anders
11 where he discussed the Department's decision to -- and I
12 don't have the exact quote -- but just monitor and
13 reassess the Box Canyon data in the future?

14 Do you agree with his statement?

15 A. Yes. I think they should be concerned about
16 using Box Canyon as a predictor. And I think not -- I
17 think that there's a really good reason for them to do a
18 comprehensive review of how the forecast supply models
19 are done, similar to what was done in 2015 with casting
20 a wide net of predictors that are more pertinent to the
21 near Blackfoot to Minidoka reach, and that just wasn't
22 performed. And I mentioned this at the beginning of my
23 testimony, I think that this should be performed to see
24 if there is a better predictor for the forecast supply
25 models, particularly the Twin Falls, given the

1 degradation.

2 Q. Matt Anders also said that, you know, there's
3 a chance that the Box Canyon R2 could stabilize or
4 perhaps improve in the future.

5 In your experience, do you think that's
6 likely?

7 A. I mean, they have not seen it improve from one
8 year to the next in any year that they've employed it;
9 so just based on the record, I think that that's
10 unlikely. It seems like it's more likely to further
11 degrade.

12 Q. Thank you.

13 And then you mentioned also in your report a
14 well, 05S31E27ABA1. I think -- you can just refer to
15 that as ABA1.

16 What was your issue with that?

17 A. You know, this is just something that I have
18 from experience because this is one of the sentinel
19 wells. It's something that -- you know, there's a
20 technical working group around the sentinel wells to
21 evaluate whether they're a good representation. I think
22 we've sort of flagged this well as it's not really
23 necessarily, being representative of aquifer conditions
24 and that it's probably more representative of sort of
25 surface water irrigation practices or maybe American

1 Falls Reservoir levels than it is kind of regional or
2 even local aquifer conditions. And so I know that this
3 well -- and I didn't have much time to evaluate the July
4 forecast model, but this well is used in some of those
5 July forecast models. And so it just catches my eye in
6 terms of, you know, that should probably be reevaluated
7 as well.

8 Q. Thank you.

9 And do you have any other recommendations on
10 improving natural flow models that you haven't already
11 discussed?

12 A. I think just in addition to doing a more
13 comprehensive and really more objective approach to the
14 forecast supply models, like a stepwise linear
15 regression that has the very specific criteria that,
16 basically, establishes the significance of including or
17 omitting variables, and these are just standard methods
18 that can be applied, I think that should have been done.

19 And then the other thing that I've mentioned
20 in both my 2015 and 2022 comments is the idea that, at
21 least from my perspective, it seems like we have a good
22 forecast supply that comes out of the joint forecast for
23 Heise. And I don't quite understand why we can't use
24 forecast supply from there to kind of develop an
25 allocation model that, basically, takes the water rights

1 administration in this reach into account to determine
2 what is available to the individual surface water
3 entities without coming up -- you know, which would
4 avoid having developed our own forecast supply models
5 that are forecasting administration effects, which I
6 think is difficult.

7 Q. Okay. Thank you. Let's move on to reasonable
8 carryover.

9 Can you explain briefly what that term means?

10 A. Yes. So reasonable carryover, it's basically
11 to establish the carryover needs of the various Surface
12 Water Coalition entities for the next surface water --
13 for the next irrigation season. And so the way that
14 they calculate that in the methodology is the baseline
15 year demand minus the projected supply, and so they
16 use -- for projected supply, they use an average of
17 historical supply -- which, again, they're choosing a
18 below average. I think they use maybe '04, '06, and
19 they didn't change that in this methodology.

20 But something that was brought to the
21 attention of the technical working group really late in
22 the process, and there really wasn't any analysis
23 around, was that the baseline year selected as 2018,
24 because it has such higher demands for the Surface Water
25 Coalition entities, it really changes -- it changes that

1 calculation as a reasonable carryover in terms of there
2 being, more often, shortfalls determined for the
3 reasonable carryover.

4 Q. And are some of your concerns reflected in
5 Table 2-7; or can you explain Table 2-7, which is on
6 page 25?

7 A. This just shows the difference in choosing the
8 baseline year and the change of the baseline year in the
9 Fourth to the Fifth. And so you can see that, for some
10 entities, we're only talking about a 4,000-foot
11 increase, but some of them, the change is like -- if you
12 look at AFRD2 there, you go from is 11,500 feet in the
13 Fourth Methodology Order to 93,000 acre-feet in the
14 Fifth.

15 Or similarly, if you look at North Side Canal
16 Company, in the Fourth Methodology Order, their
17 carryover needs were 65,000 acre-feet, and in the Fifth
18 they're, you know, over 110,000 acre-feet.

19 Twin Falls Canal Company went from
20 25,000 acre-feet to over 85,000 acre-feet.

21 And there really wasn't any analysis presented
22 to the technical working group around whether there was
23 a need for these massive increases to carryover needs.
24 Like, historically, can you show that the carryover has
25 been insufficient, you know, to these levels for those

1 entities.

2 Q. Thank you. Let's move on to your section on
3 compounding bias.

4 You state: [As read] "The Fifth Methodology
5 Order leads to curtailment of every junior right on the
6 ESPA in most years even though TFCC records demonstrate
7 that it is short of water only occasionally."

8 Can you explain that statement?

9 A. Yeah. So to explain that statement, we need
10 to look at Table 2-8.

11 Q. Okay. And that is on page 26.

12 A. Okay. So this table was based off of,
13 essentially, a hindcast analysis that Department staff
14 put together where they were showing the difference from
15 the period of 2000 to 2022 between using a baseline
16 year -- the previous baseline year and then the update
17 to using 2018 as the baseline year.

18 And so in this table, what I've pulled out is
19 the April baseline year shortfall is, essentially, the
20 second column here after the year in this table. And
21 then from that shortfall, that would be determined from
22 the Department's analysis using 2018 as the baseline
23 year. I've used -- Jennifer Sukow provided a series of
24 ESPAM model datasets that were used to generate the
25 figure that we've been over in previous testimony that

1 basically shows -- she created a curve that showed
2 various curtailment dates under the transient ESPAM
3 model and the associated shortfall.

4 And so I took those model files and,
5 basically, tried to find the curtailment date that she
6 had run that produced a benefit to the near Blackfoot to
7 Minidoka reach that most closely approximates the April
8 baseline shortfall using 2018.

9 And so the comment that you specifically
10 mentioned, I'm basically highlighting every year that
11 the shortfall determination is over 97,000 acre-feet,
12 which means whenever there is a shortfall above that,
13 it's a full curtailment to the 1900 curtailment date,
14 and that's 941,000 acre-feet of junior groundwater acres
15 curtailed. And so when you look at the hindcast of
16 these 23 years, 16 of the years result in complete
17 curtailment to that 1900 date.

18 And then in the very last column, from some
19 information provided by Twin Falls Canal Company, I
20 think related to their deposition, there was, basically,
21 a record of what their diversion rates were -- I think
22 maybe starting in the '90s. And, basically, I just --
23 in the column for each year, I included every diversion
24 rate, and I am highlighting, basically, years that have
25 a diversion rate that is less than five-eighths.

1 And there's only 4 years out of the 16 years
2 that have shown that they've diverted less than the full
3 diversion of five-eighths versus the 16 years that, you
4 know, 900 -- over 940,000 acre -- junior groundwater
5 acres are curtailed. And so this just kind of
6 demonstrates what I was discussing in the selection of
7 the baseline year; that when you shift 2018 as the
8 baseline year at the higher percent of SWC diversion,
9 there's really no balance in terms of any protection
10 against unnecessary curtailment of the juniors.

11 Q. Okay. Thank you.

12 Let's go next to the impact that nonirrigated
13 acres has when it's included in the RISD November actual
14 demand shortfall calculation.

15 On page 27, there is Table 2-9. Can you
16 explain that?

17 A. So, again, I am pulling some data from the
18 hindcast analysis that the Department did where, in
19 addition to presenting information from 2000 to 2022 for
20 the April demand shortfall, they included the November
21 reasonable in-season demand for shortfall. So in
22 November, the baseline year is no longer a component,
23 and the shortfall is completely determined based on the
24 reasonable in-season demand calculation.

25 And all I'm doing here is, basically, instead

1 of using the acres that the Department is using in the
2 Methodology Order, I'm just using the acres -- and I've
3 only done this for -- oh, no, I did all of them -- so
4 I'm only updating the acres for Twin Falls Canal
5 Company, which is the one we have very consistent
6 evidence that it's nonirrigated acres.

7 And so for Twin Falls Canal Company, I'm,
8 basically, updating the acres used in the reasonable
9 in-season demand calculation sheet to be whatever the
10 most recent irrigated lands dataset is; or for 2021 and
11 2022, I'm using what the Department reported in terms of
12 2021 near real-time METRIC acres. And I'm just showing
13 the difference in the shortfall that you calculate by
14 using those more accurate acres for Twin Falls Canal
15 Company.

16 Q. Okay. Thank you.

17 Moving to your next section, you've got a
18 Table 2-10. Can you explain this table and how it
19 relates to bias in April and July?

20 A. Sorry, that actually should be -- that's a
21 typo. This really just refers to April.

22 Q. Oh, okay.

23 A. The April forecast. Sorry, that's my mistake.

24 But in the April forecast, the -- so in April,
25 the shortfall is the baseline year -- is the forecast

1 supply minus the baseline year demand, and so -- and the
2 forecast supply comes out of the forecast supply models.
3 And those forecast supply model predictions are each
4 reduced as a measure of bias or, essentially, in favor
5 of the senior. They're reduced by one standard
6 deviation. So we don't use the forecast supply that we
7 actually predict; we use less than that.

8 And so what I'm tabulating here is basically
9 what one standard deviation is for each of the Surface
10 Water Coalition entities in terms of their forecast
11 supply models. And so just off the top of those, you
12 know, again, we focus on Twin Falls where we're
13 reducing, just to be protective, another
14 50,000 acre-feet.

15 So maybe these are all reasonable, but they --
16 individually, it's just important to remember that if
17 we're adding a bias in terms of the demand by choosing a
18 higher baseline year of 60,000 acre-feet, we also have
19 to remember that we're reducing the supply by another
20 50 -- you know, 50,000. So we're sort of starting with
21 over 100,000 acre-feet of, you know, potential shortfall
22 depending on the year just based on that.

23 Q. Okay. Thank you.

24 And then your next section bias in the 2018
25 baseline year for reasonable carryover, is there

1 anything new that you need to address here?

2 A. No. Like I said -- I mean, I didn't do -- I
3 didn't -- I wasn't able to do an analysis of,
4 essentially, a hindcast that would show the difference
5 in curtailment date from -- which is also calculated at
6 the time that there's a shortfall to the reasonable
7 carryover. So I don't have that information.

8 But what I do have is, essentially,
9 information that was presented to the technical working
10 group that I'm showing in Figure 10 that, basically,
11 just shows how this bias will create shortfall in so
12 many more years in the Fifth Methodology Order compared
13 to the Fourth.

14 So I'm showing the information from Twin Falls
15 Canal Company, and in the columns labeled either the
16 Fourth Amended Methodology Order or the Fifth Amended
17 Methodology Order, I'm, essentially, highlighting years.
18 And this isn't me; this is information from Matt Anders
19 that he presented to us. It highlights years where a
20 reasonable carryover shortfall would have been
21 calculated.

22 And you can see that over the period using the
23 Fourth, there was only three years where a carryover
24 shortfall would have been determined, and these are
25 mostly in very dry or dry years.

1 And then you see with the shift in the
2 baseline year that to 2018 that occurs in the Fifth,
3 we're now looking at, you know, most of the record is
4 going to have a shortfall, and these are going to occur
5 in even average or above-average years.

6 Q. Thank you.

7 And then just to close out the section, are
8 there any other sources of bias in the methodology?

9 A. So I touched on it a little bit that when I
10 reviewed 2018, and I looked at the Department's
11 spreadsheet for, essentially, their adjustment, where
12 they take into account either wheeled water or recharge
13 that has occurred -- and I only did this for 2018, but I
14 think it could be done for other years, and it could,
15 potentially, lower total Surface Water Coalition
16 diversions that we're using in the baseline year. So
17 that's a concern of mine.

18 But just reviewing 2018, I can see in the
19 spreadsheet that there's, basically, a note -- I think
20 it's for AFRD2 -- that it was reported that either 5,000
21 or 10,000 acre-feet was recharged, and the Department
22 has only accounted for, in their calculation,
23 5,000 acre-feet.

24 And then, additionally, based on the
25 settlement agreement reporting that is submitted by IGWA

1 to the Surface Water Coalition, it looks to me like
2 there is another 4,000 acre-feet of recharge that
3 occurred in 2018 on the North Side Canal Company that's
4 not included, and so that's about 9,000 -- that's,
5 potentially, 9,000 acre-feet of -- you know, in my
6 opinion, I think just error, but maybe bias in -- in the
7 baseline year that will occur every year -- you know,
8 that it's part of the baseline year, so that will always
9 be there.

10 And then another -- I think this has been
11 testified to. You know, another just consistent source
12 of bias is that the supplemental groundwater acres as
13 either a reduction in acres or a source of supply is not
14 being taken into account. We don't know what level, I
15 guess, that occurs, but we know it does occur, so that's
16 just consistently in there.

17 And then I think --

18 Q. Oh, please continue. Sorry.

19 A. You know, I think this has maybe been
20 discussed as well, but I think just another source of
21 potential bias in the way the baseline criteria are laid
22 out is that increasing diversions by the Surface Water
23 Coalition entities just, ultimately, result in
24 increasingly higher baseline-year criteria to meet and,
25 ultimately, a higher baseline year determined.

1 And so there's not really incentive to be
2 efficient with Surface Water Coalition diversions.
3 There's actually, seemingly, just based on the
4 methodology, there's incentive to keep your diversion as
5 high as you can because it ensures that in the future
6 more and more water comes.

7 Q. Thank you.

8 One last question: Did you raise the issue of
9 the supplemental groundwater with the Department in the
10 past?

11 A. Yes. Those were in my comments in 2015, and
12 they were in my comments in 2022.

13 And I think, you know, from my experience,
14 which has a lot to do with the ESPAM model, I know that
15 we do account for mixed source lands in the ESPAM model
16 and that there is a dataset available. And I saw some
17 notes from Matt Anders that looked like they were
18 prepared for the 2015 technical working group that
19 looked like -- it seemed like he was considering that
20 that dataset from the ESPAM model for mixed source lands
21 could be used in the Methodology Order.

22 And so it's not clear to me why that can't be
23 advanced or, you know, why we can estimate it in the
24 groundwater model, but we can't in the Methodology
25 Order.

1 Q. Okay. Thank you.

2 MS. PATTERSON: Director, we've got one last
3 section of the report to go through, so I think we're
4 about two-thirds of the way done.

5 HEARING OFFICER: Let's break.

6 MS. PATTERSON: Okay.

7 HEARING OFFICER: Let's break for 15 minutes,
8 come back at a quarter to the hour.

9 (Break taken.)

10 HEARING OFFICER: Are we back on the record?

11 COURT REPORTER: Yes.

12 HEARING OFFICER: Thank you. Mics are on.

13 Ms. Patterson.

14 MS. PATTERSON: Thank you.

15 Q. (BY MS. PATTERSON) Sophia, before we move on
16 to your section on the ESPAM model, I just want to do
17 one item of cleanup.

18 When we were discussing the irrigated acres,
19 there was a quote from your report that said the
20 "irrigated acres consistently shows that TFCC is
21 irrigating approximately 15,000 acres less than the
22 194,732" number.

23 You may have misspoke and said in some of your
24 testimony that it was 15,000 acre-feet. I just want to
25 confirm, did you mean it's 15,000 acres?

1 A. Yes. Acres.

2 Q. Thank you.

3 Moving back to your report on page 30, you
4 have a section called, "Simulation of Curtailment of
5 Junior Groundwater Rights Using the ESPAM Model."

6 Can you please explain some of the background.

7 A. The ESPAM model is used in the As-Applied
8 Order to determine the curtailment date that comes up
9 with the -- that meets the demand shortfall obligation.
10 In this section on background, I'm describing the
11 development of the ESPAM model and, essentially, that
12 it's done under the -- it's the Department's model and
13 done under the advisory of what's called the Eastern
14 Snake Plain Hydrological Modeling Committee.

15 Q. And you said before that you participate in
16 this group, the committee?

17 A. That's correct.

18 Q. And so you're quite familiar with the model?

19 A. Yes. I've been, I think, part of that
20 committee in working with the model for over ten years.

21 Q. Can you explain a little bit about the model
22 structure?

23 A. Yeah. So I think in terms of the testimony
24 I'm going to give today, what's important about the
25 model structure is that it's a single layer throughout

1 the entire model. It's a single-layer model, and it's
2 defined with homogenous isotropic properties, which
3 means that it, basically, doesn't differentiate between
4 horizontal and vertical hydrologic conductivity, which
5 relates to how quickly or easily water moves through the
6 aquifer system.

7 Q. And then tell us a little bit about the
8 calibration process.

9 A. Sure. So when you develop a model, you build
10 the structure and you build the boundary conditions that
11 you think best represent reality in a simplified version
12 in the model, and the model is calibrated, basically,
13 over a historical period where you've developed various
14 sets of model input data, like groundwater consumptive
15 use or tributary inflow, and then the model is,
16 basically, calibrated over that historical period. And
17 it's calibrated based on trying to get the best match to
18 historical observations of what are called "model
19 targets."

20 And those historical observations are
21 typically, things like water levels in the aquifer and
22 reach -- basically, reach gains or spring level --
23 spring discharge data, so you're -- in calibration
24 you're trying to get the best fit with those historical
25 observations.

1 With the ESPAM model, they used an automated
2 calibration tool that's called PEST. And the way that
3 PEST works is that the modeler, basically, gets to
4 assign PEST a certain set of parameters that it's
5 allowed to adjust up or down based on ranges that the
6 modeler gives it.

7 I think in terms of my testimony that I'm
8 going to give today, it's important to understand that
9 the parameters that PEST is allowed to adjust in its
10 model calibration process is aquifer properties like the
11 transmissivity and the storage of the aquifer, and then
12 it's also allowed to adjust water budget components like
13 tributary underflow values and nonirrigated land
14 recharge.

15 Q. Thank you.

16 And you've got a section on model uncertainty.
17 Why did you feel it important to discuss this?

18 A. Yeah. So, you know, all models inherently
19 have model uncertainty. Because of what I said, they're
20 basically a simplification. There's model uncertainty
21 around the target observation that we put in, so when
22 we're trying to get it to match the reach gain, like the
23 near Blackfoot to Minidoka reach, that's subject to just
24 error, like in the observation in the target data, like
25 reach gain error around the gage measurement. But it's

1 also subject to, essentially, errors that are caused by
2 uncertainty that we have in the water budget components
3 or the aquifer properties themselves.

4 And so we have uncertainty around, like I
5 said, the aquifer properties in some of those model
6 budget components, and that's why we allow PEST in the
7 calibration process to adjust those. So that's one type
8 of model uncertainty around water budget components.

9 And then there's another type of model
10 uncertainty that just has to do with how the model is
11 built conceptually and how well that conceptual model
12 matches the reality.

13 And I think when we look at, basically, the
14 hydrologic controls on the discharge, the near Blackfoot
15 to Minidoka reach, which is the particular prediction
16 that we're using ESPAM for in this surface water
17 delivery call, there's significant limitations in the
18 conceptual model of the ESPAM in that reach.

19 Q. And you note in your report on page 32 that no
20 amount of data improvement resampling or recalibration
21 can correct errors stemming from incorrect or simply
22 incomplete model conceptualization.

23 In the Blackfoot to Minidoka reach, are those
24 sort of what you're talking about where there's just
25 some things built in that you're not going to be able to

1 calibrate around?

2 A. That's right.

3 So, you know, PEST is going to do its best to
4 match the model results with the targets no matter how
5 we build the model. And so if you build the model wrong
6 in that area, it's going to match the observation, as
7 well, in terms of the calibration process, but it's not
8 going to match them for the right reasons because it's
9 not built the right way. And I think that's,
10 essentially, the point there.

11 Q. Thank you.

12 And under 3.4.2 of your report, you talk about
13 the Blackfoot to Minidoka reach.

14 Can you explain kind of what you would want to
15 see in the model to address this issue?

16 A. Sure. So what I'm referring to a lot in this
17 section -- I'm referencing a report that was done in
18 2008 by Ralston -- I think -- Engineering Services, and
19 it was done for the Department, prepared for the
20 Department. And it's, essentially, a look at how the
21 model -- and they're evaluating ESPAM1.1, I think, based
22 on the date there, but these same conceptualizations,
23 the same in this area in ESPAM2.2, so it all applies.

24 But it's, essentially, a critique of how the
25 model is built in that area, because they lay out

1 geologic -- the hydrogeologic framework that shows that
2 the model actually is -- or the aquifer is very -- has
3 multiple aquifer layers and what are called aquatards or
4 impermeable layers within the aquifer that are,
5 essentially, the main controls on what's dictating the
6 discharge in the near Blackfoot to Minidoka reach.

7 And because the ESPAM model is a single-layer
8 model that doesn't have the vertical hydraulic
9 connectivity represented, it's not able to re-create the
10 flow conditions in terms of the major controls, which
11 it's laid out through the -- based on the geology there,
12 we know that there are significant vertical flow
13 components that lead to the discharge in the near
14 Blackfoot to Minidoka reach.

15 Q. And on page 33, you have Figure 3-1 and 3-2.
16 Are those figures from the Ralston report?

17 A. Yes. So these are excerpts from that report
18 that are taken from previous hydrogeologic
19 investigation. And, essentially, what I'm trying to
20 illustrate in 3-1, this shows, basically, the
21 interlayered nature the interfingering of the aquifer
22 system, which is shown in kind of the darker vertical
23 line stippled -- or dashed area, and then the
24 impermeable layers that are shown as kind of the
25 stippled lighter areas in that figure.

1 And so what happens -- and I think it's,
2 basically, what is controlling the discharge to the near
3 Blackfoot to Minidoka reach -- is that the main aquifer
4 system, basically, encounters these very impermeable
5 layers in the vicinity of the American Falls reach, and
6 that forces -- because they can't move through these
7 impermeable layers, it forces the water to discharge to
8 that reach, but it's going to be discharging vertically,
9 basically, through these interconnected hydrologic
10 aquifers.

11 Q. Okay. Thank you.

12 So if I understand, that section relates to
13 kind of the framework of the model and, you know, issues
14 that might be there?

15 Can you explain 3 -- 3.4.3 section on page 34
16 of your report?

17 A. Yeah. So what we just went over were,
18 essentially, the aspects of the conceptual model
19 uncertainty. What this section talks about is
20 uncertainty around our input parameters, and so what I'm
21 referring to in this particular section is the aquifer
22 properties.

23 And so the aquifer properties are
24 transmissivity and storage, and those two combine to,
25 basically, control how quickly or slowly water will move

1 through a system. So if we think about the curtailment
2 simulation for the Methodology Order, it's,
3 essentially -- controls how a reduction in groundwater
4 pumping in one area will propagate to the near Blackfoot
5 to Minidoka reach will be based on those aquifer
6 properties, and we have uncertainty in those aquifer
7 properties.

8 And so they're something that are adjusted
9 during model calibration, and so we'll get -- these will
10 change as new -- as each new version of the model comes
11 out. And so that's, more or less, what I'm describing,
12 kind of the evolution of these properties with the
13 versions of the model.

14 Q. So why don't you, then, explain your next
15 section, which compares ESPAM1.1 to 2.2?

16 A. So are we looking at, like, Figure 3-3?

17 Q. Yes. And that is on page 36.

18 A. So here in this figure, I'm, basically,
19 showing -- I know you can't read these figures -- and so
20 I'm showing the distribution of one of those terms,
21 "transmissivity," so sort of the resistance to which
22 water can move through the system. What I'm showing for
23 each version of the model is the mean transmissivity,
24 and so you can see how these values from ESPAM1.1 to 2.1
25 -- and then change.

1 I've got -- on the left side of this figure,
2 I'm describing the ESPAM2.2 model that was proposed to
3 the Eastern Snake Plain Hydrologic Modeling Committee in
4 January of 2020, and then I'm also showing, above that,
5 the actual version of ESPAM2.2 that was accepted, which
6 was proposed in September of 2020.

7 And what I'm going through -- the reason I'm
8 going through this evolution in this section is that
9 when the version that was proposed in January was
10 presented to the Eastern Snake Plain Hydrologic Modeling
11 Committee, I did a review of the model, basically,
12 looking at how the calibration -- how the calibration
13 had turned out. And then, as I've mentioned prior in
14 testimony, I do a lot of analysis for my clients, IGWA,
15 around using the model.

16 And so I ran the model -- I ran some of those
17 basic analyses that I do all the time with the new
18 version of the model, and I was seeing really, really
19 drastic changes in terms of what it was predicting for
20 water levels, like at the sentinel wells, for example,
21 or what it was predicting in terms of what responses to
22 recharge activities were going to be.

23 And so in January, I raised those concerns to
24 the committee saying that, essentially, the changes that
25 we were seeing -- that I was seeing in the model -- I

1 think were hard to explain based on the structural
2 changes that we made to the model. And I just -- I had
3 concerns about -- particularly, one of the main inputs
4 that we had changed to the model was one of the water
5 budget components.

6 It was, essentially, introducing the METRIC
7 data to calculate consumptive use. And I thought that
8 that was probably a likely change for -- you know, I
9 thought that that input and, then, how the model dealt
10 with that input, in terms of its calibration, was kind
11 of -- was a likely change for what we were seeing in
12 terms of such widespread differences in aquifer
13 transmissivity.

14 And then particularly if we go to the next
15 figure, that shows the same thing for storage in terms
16 of the evolution between the models and the storage
17 values average across, there again, changing very
18 drastically. And that's really, really changing the
19 type of model predictions that we're getting.

20 So I just raised this concern to the
21 committee; that I thought before we release this version
22 of the model, there was some things that I thought we
23 should analyze, to check out to make sure that we were
24 comfortable with what was resulting from the
25 calibration.

1 Q. Okay. When you said "the next figure," are
2 you referring to Figure 3-4 on page 37?

3 A. Yes. So this shows the storage, which,
4 ultimately, I think, was probably one of the main
5 drivers for the differences that we are seeing in
6 predictions in terms of water levels and responses for
7 reach gains -- through reach gains.

8 Q. Moving to the next page, 38, you have
9 Figure 3-5.

10 Can you explain this chart?

11 A. Yeah, so in this chart, I think you should
12 focus on the yellow lines in this figure. And,
13 essentially, this is a really standard analysis that the
14 Department does with any version of the model that they
15 release, and it shows a curtailment response. In this
16 case, we're looking at curtailment of groundwater rights
17 junior to 1961.

18 And the dashed yellow line shows the response
19 to the near Blackfoot to Neeley reach using version
20 ESPAM2.1, and the solid line shows the predicted
21 response to that reach using ESPAM -- the accepted
22 version of ESPAM2.2.

23 Q. And what does this difference mean?

24 A. So these are -- it's just a difference in what
25 it predicts under the different model version. And I

1 think it's about a 20 percent difference in terms of
2 what they predict. And the difference in the prediction
3 has to do with, essentially, what I was talking about,
4 how those aquifer parameters influence the timing of
5 responses from a reduction in groundwater and how that
6 moves to the reach.

7 Q. And then can you explain Figure 3-6?

8 A. This compares, again, the ESPAM2.2 and
9 ESPAM2.1, what the steady state response function is, so
10 the percentage of water from each model cell that would
11 result in -- essentially, if you stressed any one of
12 these model cells, the percentage of that stress that
13 would impact the near Blackfoot to Neeley reach under
14 steady state conditions.

15 And so, again, just the difference in the
16 distribution of these shows the difference in the timing
17 and -- that results from changing to this new version of
18 the model.

19 Q. You discuss, on page 39, the ESPAM water
20 budget component uncertainty and the current model.

21 Can you just go through that and explain some
22 of the uncertainties?

23 A. Yes. So this was related to the concern that
24 I brought up to the committee in January of 2020 when
25 they proposed their first, potentially, version of

1 ESPAM2.2. And the differences I saw is basically what I
2 reviewed from calibration -- from the calibration
3 results where I had mentioned that PEST, the tool, is
4 allowed to adjust water budget components up or down to
5 better match the observed targets.

6 And if we turn to -- you're looking at
7 Figure 3-7; is that what you're looking at?

8 Q. Yes, on page 40.

9 A. Yes. So when you look at Figure 3-7, the
10 initial estimate for -- what I'm showing on the left
11 there is the initial estimate for the volume of annual
12 recharge -- natural recharge to the reach. And what we
13 see -- precalibration is the blue line, and
14 postcalibration is the orange line.

15 And what we see is that PEST is trying -- so
16 that it's able to match the observation, it's increasing
17 the amount of natural recharge components across the
18 ESPAM model pretty significantly. And I've put a couple
19 of those components on the right side of the graph where
20 the lines represent the same thing.

21 Blue is precalibration and orange is
22 postcalibration, and we're looking at tributary
23 underflow, and then we're looking at recharge on
24 nonirrigated lands. And so what we see is that for the
25 model to be able to calibrate, it's having to increase

1 the amount of tributary underflow or nonirrigated land
2 recharge to compensate for that.

3 And what we saw -- what we saw in the storage
4 is that we also saw the model had to significantly
5 increase its aquifer storage values.

6 And all of these things combined tell me that
7 it seems like PEST it trying to adjust for the fact that
8 we're taking too much water out of it. It's working
9 really hard in calibration to get more water into the
10 model wherever it can, either by increasing the
11 aquifer's storage or by increasing these water budget
12 components.

13 And so I had questioned to the committee --
14 because I was part of --

15 COURT REPORTER: I'm sorry, Ms. Sigstedt, I
16 think I missed a little bit. "And so I had questioned
17 to the committee"?

18 THE WITNESS: I questioned to the committee
19 the use of the METRIC processing that we were using.

20 Q. (BY MS. PATTERSON) Okay. Go ahead and
21 continue from there.

22 A. And the reason that I questioned the METRIC
23 processing was because I was part of a technical working
24 group that discussed how the METRIC data would be
25 processed, and I remembered that they were choosing,

1 basically, whether to apply a buffer or sort of an
2 increase in the area around the actual field irrigated
3 area to -- they were trying to decide what buffer area
4 they would use to process the METRIC data.

5 And I remembered in that committee that there
6 wasn't really a well-justified reason for the buffer
7 that they ultimately decided that -- they were
8 considering like two or three different buffer areas,
9 and, ultimately, they just chose the largest one which
10 had resulted in the largest estimate of ET. And I was
11 concerned that maybe it was that processing that was
12 creating us to overestimate the METRIC application in
13 ESPAM that results in one of the largest model
14 components, which is the groundwater consumptive use
15 component of the water budget.

16 And so in my recommendations to the committee
17 in 2020 when they proposed this model was that they do a
18 sensitivity analysis around that processing and just
19 either try and verify the processing they were using by
20 looking at, you know, a field verification or something
21 like that or, like, an on-the-ground verification of the
22 number that they were using or just test the model to
23 the sensitivity of using -- of processing the data some
24 of the other ways that they proposed and see if one of
25 those helped with this calibration or how much it

1 influenced the calibration.

2 Q. So was the idea trying different methods,
3 running through and seeing kind of what the parameters
4 look like on Figure 7.3, and seeing if those improve
5 with different runs?

6 Was that the sensitivity you were requesting?

7 A. Exactly, just seeing how it changed. So if we
8 tried some of the other processing methods, would the --
9 would this preimposed calibration of, you know, the
10 tributary underflow or the -- the nonirrigated lands
11 recharge, would PEST seem to adjust those less.

12 And then on the -- like I said, the storage
13 value, the change in the aquifer storage value, was
14 something I was really concerned with, mainly because in
15 calibration, we have a preferred value for that storage.
16 It's something around .205. And you can see that, if you
17 look at the evolution of that figure, each version of
18 ESPAM2.2 is moving further away from that. And so to
19 see if our -- the change in the storage wasn't as
20 drastic testing the sensitivity to that under the
21 different processing method.

22 Q. Thank you.

23 Can we move to page 41, Figure 3.8, and can
24 you explain to me what this addresses.

25 A. So ultimately, the Department chose not to

1 take the recommendation that I gave in January to test
2 those parameters, and they did do some -- I think they
3 extended the model calibration period, which was another
4 recommendation I made, before they proposed another
5 version of this model of this ESPAM2.2 model in
6 September, and in September they asked for the committee
7 to, basically, have a vote to accept that model. That
8 was, ultimately, the version that was adopted as
9 ESPAM2.2.

10 Following that meeting, the Department asked
11 for recommendations from the committee about future
12 improvements to ESPAM, we just start working on the next
13 version of the model immediately. In those
14 recommendations to the committee, I again brought up
15 this issue that I discussed around, you know, some kind
16 of verification of the METRIC processing.

17 Ultimately, the Department did do that, and
18 when they looked at sort of a preliminary field
19 investigation of the processing and then they also
20 compared their METRIC processing to some open source
21 metric.

22 So the in-field investigation looked at using
23 the diversion data compared to the METRIC processing,
24 kind of a field-by-field basis, and then they also
25 compared their METRIC processing method to just some

1 open source ET data. There's a couple of different
2 sources they could see. And what they consistently saw
3 was that their method produced a much higher ET rate
4 than any of the open source data or the comparison to
5 the diversion data.

6 And so they consulted with ET -- or more like
7 METRIC specialists or experts -- and they, basically,
8 reviewed the processing method the Department was using,
9 and they did say that it should be -- that that was
10 probably not the correct way to do it and that they had
11 a different recommendation for how that processing
12 should be done. And then the Department has basically
13 done an initially recalibration using an alternative
14 processing of the METRIC data, and that's what I'm
15 showing in Figure 3-8.

16 So on the right side of this figure is the
17 current ESPAM model for those same aquifer properties we
18 were looking at, transmissivity and aquifer storage; and
19 then on the left is the preliminary recalibration of the
20 model. And so, you know, particularly for storage, what
21 you see is that the value is going down, you know, is a
22 lower -- closer to that preferred value of .05 that we
23 have.

24 And then if we move on to the next figure,
25 which is 3-9, I've highlighted -- or this is really,

1 actually, Jennifer's figure, where she's highlighted
2 some of these water budget components that I touched on.

3 So we've got the ESPAM2.2 value shown in green
4 for the water budget component, and then we have the
5 precalibration refined METRIC processing value shown in
6 gray. And then we have the postcalibrated with the new
7 processing method shown in blue.

8 And so what you see is that this eliminates
9 that concern that I highlighted earlier where when you
10 compare the gray bar to the blue bar, which is
11 precalibration versus postcalibration, we see that the
12 -- that FS isn't having to adjust those model parameters
13 anymore. Precalibration and postcalibration, the values
14 are pretty similar.

15 But also what we see is that there's a huge
16 difference in some of these components. Like, I think,
17 nonirrigated recharge and tributary underflow, we're
18 looking at like 300,000 acre-feet differences between
19 ESPAM2.2 and this preliminary calibration model; and for
20 groundwater CIR, we're looking at a difference of like
21 600,000 acre-feet.

22 So what this highlight s for me and the reason
23 that I'm bringing it up here is that we just have
24 significant uncertainty in these model -- these water
25 budget components right now in the model, and it's

1 leading to significant uncertainty because of the way
2 the model is calibrated, and it's able to adjust both
3 water budget and aquifer parameters. At the same time,
4 it's leading to significant uncertainty in the water
5 budget -- I mean, in the aquifer parameters.

6 And, you know, this preliminary calibration,
7 the storage value that we see, is getting a little
8 closer to, you know -- a little closer to what was in
9 2.1. And so when I showed you, before, the response
10 from curtailment, the difference between 2.2 and 2.1,
11 we're, again, going to see a shift whenever the next
12 version of the model is released, which, you know, won't
13 be for years, probably. But it will again change that
14 prediction. And we sort of already know at this point
15 that it's wrong.

16 Q. Thank you.

17 Let's move next to Section 3.4.4, and if you
18 can just explain this section and the Table 3-1.

19 A. Yeah, so this is just a section that kind of
20 describes some of my conclusions, again just kind of
21 relating the fact that we have this aquifer
22 uncertainty and that it -- I mean, that we have this
23 model uncertainty -- and that it directly affects the
24 prediction that we're making at this near Blackfoot to
25 Minidoka reach for the methodology.

1 The table is an analysis that was done by
2 Jaxon Higgs, who couldn't be here to testify, so I went
3 over the analysis with him, and I'm going to testify on
4 it today.

5 And, essentially, what it lays out is -- it
6 takes the model files that the Department produced as
7 background data for the current curtailment date for
8 this April As-Applied Order, and it splits it into -- it
9 splits it geographically by groundwater district to see
10 how each district's reduction in pumping affects the
11 near Blackfoot to Minidoka reach.

12 And so if I just go through the columns, we've
13 got the first column is just IGWA's proportionate share
14 broken down by districts that comes from that
15 curtailment.

16 And then if we move to the column that is the
17 transient May-through-September impact, that's,
18 basically, by district what impact comes -- you know,
19 what will show up within that first season from the
20 curtailment for each district. And then the next column
21 shows the curtailment volume, so the amount of acre-feet
22 curtailed within each district. And then the next
23 column is basically the ratio of those two.

24 And so what we see is that the response from
25 each groundwater district, because of its distance or

1 hydrologic connection to this reach, is really variable
2 in terms of the type of benefit that we get for how you
3 curtail to near Blackfoot to Minidoka reach gain.

4 And, you know, particularly if we go to some
5 of these districts at the bottom and we look at, like,
6 Jefferson Clark, Magic Valley, North Snake, we see --
7 and then, you know, we can see that the response to what
8 they get at the reach is extremely low compared to what
9 they have to curtail.

10 And so, again, moving through this column,
11 there's the next column that, basically, tabulates by
12 district the number of acres that are curtailed. And so
13 we can see, just kind of adding up some of those bottom
14 districts with the lowest response, we're talking about
15 in the vicinity of 300-, 400,000 acres that are
16 curtailed that have almost no in-season benefit to the
17 near Blackfoot to Minidoka reach.

18 And I think that those are probably my main
19 conclusions from this.

20 Q. Thank you.

21 A. I guess -- actually, I guess it is also
22 interesting to look at the next two columns, which is
23 percent of acres curtailed, and you can just -- again,
24 just illustrates for a year like this, using the
25 transient model -- for a lot of these districts, you're

1 talking about, you know, 70 to 97 percent of the
2 groundwater acres in those districts are curtailed under
3 this type of curtailment date.

4 Q. Thank you.

5 The last section is your summary of
6 conclusions. I think we can go without you reading
7 these on the record, and I will just move to admit
8 Exhibit 837.

9 HEARING OFFICER: Any objection from the
10 parties?

11 Hearing no objection, the document marked as
12 Exhibit 837 is received into evidence.

13 (Exhibit 837 received.)

14 MS. PATTERSON: And that will be -- I'm done.

15 HEARING OFFICER: Any further questions of
16 Ms. Sigstedt from the groundwater users group?

17 MS. MCHUGH: I have questions.

18 HEARING OFFICER: Ms. McHugh?

19 MS. MCHUGH: Should I sit there?

20 HEARING OFFICER: You're welcome to sit here.

21
22 DIRECT EXAMINATION

23 QUESTIONS BY MS. MCHUGH:

24 Q. Good morning, Sophia. I just had -- I wanted
25 to make sure I understood your testimony correctly

1 relevant -- I think it's to Exhibit 826. It's a table
2 where you did a hindcast. It's Table 2-8, the hindcast
3 of what the impact is for using 2018 as a baseline year.

4 A. Okay.

5 Q. And I just wanted to ask you about -- just
6 make sure I understood your testimony about what you
7 would expect going forward now using the 2018 baseline
8 year.

9 A. I think we can expect that in most years, the
10 aquifer is going to be curtailed to pretty much --
11 potentially, it's -- all of the junior groundwater acres
12 are going to be curtailed more than half of the time,
13 60 percent of the time if we just use the hindcast.

14 And then using -- also looking at the
15 hindcast, we can see that there's only four years out of
16 this 20-year period where less than 300,000 acre-feet of
17 junior groundwater acres are curtailed. So I think, you
18 know, almost every year you're going to see more or at
19 least 300,000 acre-feet of junior groundwater pumper
20 acres curtailed using the 2018 as the baseline year.

21 Q. And when you say -- when you mean "curtail,"
22 you're meaning that in the analysis for the As-Applied
23 Order in April, there will be a forecast of shortage to
24 at least one member of the Surface Water Coalition; and
25 what I understood you to say over -- in at least

1 66 percent of the years going forward?

2 A. I think 60 percent of the years.

3 Q. Okay.

4 MS. MCHUGH: That's all I wanted to ask.

5 Thank you.

6 HEARING OFFICER: Okay. Other questions from
7 the groundwater group?

8 All right. Cross-examination.

9 Mr. Simpson.

10 MR. SIMPSON: Yes. If we could go off the
11 record for a moment. I can move all my stuff up there
12 and get organized.

13 HEARING OFFICER: Yes. Okay. Let's go off
14 the record.

15 (Break taken.)

16 HEARING OFFICER: Let's go back on the record,
17 Andrea. We're recording.

18 Thank you, Mr. Simpson. You may examine
19 Ms. Sigstedt.

20

21 CROSS-EXAMINATION

22 QUESTIONS BY MR. SIMPSON:

23 Q. Ms. Sigstedt, good morning. My name is John
24 Simpson. I'm one of the attorneys for A&B Irrigation
25 District, et al., and I'll be cross-examining you this

1 morning.

2 Is it okay if I call you "Sophia"?

3 A. Yes, that's fine.

4 Q. Thank you. So, Sophia, from your direct
5 testimony this morning, you've been working on these
6 issues on conjunctive management on the ESPA for well
7 over ten years; is that correct?

8 A. I think, yeah, over ten years.

9 Q. Okay. And during that time, you've been
10 retained by IGWA specifically for those efforts?

11 A. That's correct.

12 Q. And you mentioned in your direct testimony
13 that in approximately 2012, around the time you started
14 working for IGWA, you worked on the modeling in the
15 Rangen case.

16 Do you recall that testimony?

17 A. Yes.

18 Q. And in that case, did you use the ESPA model
19 as a part of your tasks that you performed on behalf of
20 IGWA?

21 A. Yes.

22 Q. Okay. And did you use that ESPA model in the
23 version that was then present because it was the best
24 science that was available for your efforts?

25 A. I think so.

1 Q. Okay. If it was the best science available at
2 that time, would you agree that it's the best science
3 available today to estimate or predict the responses of
4 the aquifer to stresses such as groundwater pumping?

5 A. I do.

6 Q. And that would include stresses in every reach
7 of the Snake River, including the near Blackfoot to
8 Minidoka reach?

9 A. Yes.

10 Q. And in using the model, have you used it in
11 both the steady state and the transient version?

12 A. Yes.

13 Q. And in your opinion, is the transient version
14 of the model and running of the model the best predictor
15 of what would need to be accomplished on the aquifer to
16 deliver water into the Blackfoot to Neeley reach -- or
17 excuse me -- the Blackfoot to Minidoka reach?

18 A. Over what time period?

19 Q. In the -- in the present irrigation season.

20 A. I think it's the only version that can predict
21 in the present year of irrigation season.

22 Q. So if we're attempting to use the model to
23 identify what actions need to be taken on the ESPA to
24 deliver a volume of water into the Blackfoot to Minidoka
25 reach during the irrigation season, the transient model

1 would be the only version to use; is that correct?

2 A. That's correct.

3 Q. During your direct testimony, Sophia, you
4 discussed the efforts in early 2015 by the technical
5 work group.

6 Do you recall that testimony?

7 A. For the Surface Water Coalition technical
8 working group?

9 Q. Yes.

10 A. Yes.

11 Q. And in looking at the comments that were
12 provided by you on behalf of IGWA and then the
13 recommendations made by Department staff to the Director
14 as a result of those efforts, do you recall the time
15 frame under which those comments were made?

16 A. I think you would look at the dates of the
17 memos. I think mine were in March.

18 Q. Right. And so, I mean, you testified that
19 there was a limitation of time -- a limitation of time
20 at that point that limited the number of issues to be
21 discussed or recommendations to be made.

22 Do you recall that testimony?

23 A. That was in the Department's conclusions and
24 their recommendations.

25 Q. And do you believe that limitation was in

1 reference to the work that was completed in March of
2 2015 relative to the irrigation season that was then
3 pending?

4 A. I don't know.

5 Q. You testified earlier today regarding the --
6 on page -- I believe it's on page 10 of your report
7 Table 2-3, if you'd turn to that, please.

8 And this is a summary of the SWC irrigated
9 acres, the 2022 technical work group, is it not?

10 A. That's correct.

11 Q. And you described earlier the various columns
12 and the basis for the various columns, that is either
13 the shapefiles or the irrigated lands datasets that were
14 generated by the Department; is that correct?

15 A. That's correct.

16 Q. And would you agree that for the irrigated
17 lands dataset, the 2011 or the 2017 or the METRIC
18 processing acres 2021, that those are just a snapshot in
19 time?

20 A. Yes.

21 Q. So at that particular point in time,
22 whatever's identified with respect to those datasets,
23 the number of irrigated acres identified would be
24 relevant, but you can't, necessarily, draw conclusions
25 as to what's happening before or after that particular

1 snapshot; is that correct?

2 A. I think that there's evidence that they don't
3 change that much between them, if you look at what I
4 focused on here for Twin Falls Canal Company between
5 2017 -- or 2011 and 2017. And I think that that's the
6 reason that, for example, in the modeling for, you know,
7 years that we don't have the intervening data, we just
8 use whatever the most recent data is because we have
9 some confidence that the level of difference is not
10 going to be that great.

11 Q. But, for example, between 2011 and 2017, you
12 don't have an irrigated lands dataset for 2013, do you?

13 A. I actually think there is, potentially,
14 irrigated lands datasets for every year in between this,
15 based on the information that I saw on a Department
16 information page. But I haven't verified those in the
17 archive, but I think there are additional years to
18 what's shown here.

19 Q. So for 2013, for example, what irrigated land
20 figure would you utilize? Would you use an unknown
21 number that you haven't calculated for 2013, or would
22 you use the shapefile acres for SWC members and
23 specifically for Twin Falls?

24 A. I think that the change that you see -- I
25 think that they should be updated relative to each

1 other. So in my opinion, in 2013, the shapefile that
2 was submitted by SWC should have been verified against
3 the 2011 irrigated lands dataset as well as against the
4 acres identified in the SPF report that were accepted
5 previously in the methodology to confirm that either
6 those acres were still nonirrigated or that they had
7 somehow changed to be irrigated.

8 Q. But would you agree that, in 2013, the best
9 information available to the Department was the SWC
10 shapefile for Twin Falls Canal Company?

11 A. No. Because the Department really made it
12 clear that they don't verify the acres that are
13 submitted from the Surface Water Coalition entities to
14 identify nonirrigated acres, and those efforts to
15 identify nonirrigated acres are done in other datasets.

16 Q. So within the irrigated lands dataset, can you
17 explain to me what the difference is between
18 semi-irrigated and irrigated lands?

19 A. Semi-irrigated is a classification that, like,
20 a subdivision or a developed area would be classified
21 into. And irrigated are, you know, purely irrigation
22 lands like an agricultural field.

23 Q. And do you know the time of the year that the
24 irrigated lands dataset was generated, for example, in
25 the spring or in the midsummer? Late fall?

1 A. I think that they use, you know, a variety of
2 different sources that probably all -- they use
3 satellite imagery, they use aerial imagery, so the dates
4 on all of those are going to vary.

5 Q. So would you agree that, depending upon the
6 date of a photograph of -- showing irrigated acres, if
7 it was in the early spring, that later in the spring or
8 later in the summer that those particular lines might be
9 irrigated if they previously were shown as not
10 irrigated?

11 A. I think the point of generating the irrigated
12 lands dataset is specifically to characterize irrigated
13 acres for the consumptive use calculation used in the
14 model. So I think their, you know -- their method is
15 based around trying to capture that as best they can. I
16 don't know the dates or how they make sure that that is
17 true.

18 Q. So now turning to your testimony on the
19 baseline year, is it fair to say that your -- the issue
20 you draw with utilizing the base year 2018 as the new
21 baseline year under the Fifth Methodology Order was that
22 it was above the average for looking at all years?

23 A. I think relative to previous baseline years
24 that have been selected in previous orders, it's a
25 higher percentage than have been selected previously.

1 And my testimony is that it is possible to select
2 something that's more consistent with the baseline year
3 that has been adopted in previous methodologies.

4 Q. So more consistent with being closer to the
5 average as opposed to more conservative in terms of
6 baseline year demand?

7 A. Yes, more consistent with the previous percent
8 of average.

9 Q. So do you have an understanding of why the
10 Department picks a baseline year that's above average?

11 A. They're trying to give the senior adequate
12 protection.

13 Q. Protection against what?

14 A. I think protection that they're going to have
15 the supplies that they need to meet demands in the next
16 coming season.

17 Q. And do you know why they, the Department or
18 the -- in the Methodology Order -- identify an
19 above-average year as opposed to a below-average year?
20 Is it because of a court determination that requires
21 that?

22 Do you have a general understanding?

23 A. I have seen, I think, that language that
24 you're referring to.

25 Q. You've reviewed that language?

1 A. I've seen it before. I think it was in one of
2 your expert reports.

3 Q. Okay. With respect to the baseline year and
4 your testimony regarding looking at 2018 as a baseline
5 year, do you recall your testimony regarding
6 above-average years and the potential for lax
7 operations -- I wrote it down; you used that phrase "lax
8 operations" -- by project managers in terms of
9 delivering water?

10 Do you recall that testimony?

11 A. Yes. I think that I was referring to water
12 supply outlooks in 2018 based on the snowpack that
13 occurred in that year. People had confidence, I think,
14 at that time that it wasn't going to be a constrained
15 water supply year, that there would be recharge
16 opportunity.

17 COURT REPORTER: I'm sorry, can you repeat
18 that last part again.

19 THE WITNESS: That there would be recharge
20 opportunity.

21 COURT REPORTER: Thank you.

22 Q. (BY MR. SIMPSON) How does recharge
23 opportunity relate to project managers delivering their
24 water supply?

25 A. I don't know that they do.

1 Q. So I took what you said when you said "lax
2 operations" for the projects, that managers weren't as
3 careful when they deliver water in a year like 2018.

4 Would that be a correct conclusion?

5 A. I think I'm just saying that that's possible.
6 I know that I think -- or I think that it's easier to
7 run operations with higher volumes through the system,
8 and if you know that it's not going to be constrained,
9 maybe you would want to have your operations be easier.
10 But I don't know that.

11 Q. You don't have any evidence that shows that;
12 is that correct?

13 A. That's correct.

14 Q. So in your testimony we discussed -- -- strike
15 that.

16 You discussed the issue of reasonable
17 carryover and how a modification in the baseline year
18 resulted in a change in reasonable carryover for SWC
19 members.

20 Do you recall that testimony?

21 A. Yes.

22 Q. And that that change increased the carryover
23 figures for many of the SWC members; correct?

24 A. Correct.

25 Q. Do you have an understanding with respect to

1 the methodology and the identification of reasonable
2 carryover and what the purpose of reasonable carryover
3 is?

4 A. I identified that in my report as something
5 that I would like to have given more consideration if I
6 had more time. It's something that I am less familiar
7 with at this time in terms of what all of the
8 considerations around reasonable carryover are, and it's
9 something that was not presented to the technical
10 working group in 2022.

11 Q. So with respect to the purpose of reasonable
12 carryover, you don't have a clear understanding of why
13 it's identified in the methodology?

14 A. I mean, I think it's to protect that you have
15 adequate supplies for the next irrigation season.
16 That's the purpose of your reservoirs, are to carry over
17 supplies when you need them.

18 Q. So the purpose of that carryover figure is to
19 protect the SWC members and to ensure that they have an
20 adequate water supply for the following year?

21 A. That's my understanding.

22 Q. And in the context of your testimony regarding
23 bias being built into the reasonable carryover, how does
24 that bias impact the reasonable carryover figure?

25 A. In my report and in my testimony, I think I'm

1 being specific to how the selection of the baseline year
2 is affecting reasonable carryover. And so it's kind of
3 just related to the fact that I think, compared to
4 previous baseline year determinations in previous
5 orders, 2018 is a further bias in terms of how it
6 predicts demand needs.

7 Q. Sophia, with respect to the Methodology Order,
8 would you agree that the purpose of that Methodology
9 Order is to ensure that the injured party receives water
10 when they need it?

11 A. I think that is a fair statement.

12 Q. When you were testifying as to forecast
13 supply, you identified some concerns regarding the
14 continued use of Box Canyon as part of the forecasted
15 supply determination in the As-Applied Order for April.

16 Do you recall that testimony?

17 A. Yes.

18 Q. So earlier, Sophia, you testified that you had
19 been involved in the Rangen call, so you have a general
20 understanding of the ESPA and ongoing efforts on the
21 ESPA regarding recharge efforts and other efforts
22 throughout that area?

23 A. I think so.

24 Q. So do you have a general understanding that a
25 number of the Water Resource Board's activities with

1 respect to managed recharge are occurring in the lower
2 valley, that is, diversions occurring below American
3 Falls?

4 A. I would say most of the Board's recharge is in
5 the lower valley.

6 Q. And with respect to that recharge that's
7 occurring in the lower valley, do you have an
8 understanding that most of the benefits from that
9 recharge have propagated into the reaches below Milner?

10 A. I think that that is true.

11 Q. And could that -- those efforts by the Board
12 influencing the Box Canyon and the issue that you raise
13 with respect to the R-squared values associated with
14 Box Canyon as a reasonable forecast tool?

15 A. I think that those recharge efforts influence
16 the discharge at Box Canyon.

17 Q. So if those recharge efforts were leading to
18 the overprediction of the discharge from Box Canyon,
19 could that have an impact on the forecasted supply in
20 April for SWC members?

21 A. It would be a matter of looking at the timing
22 of that, the timing of when they -- what discharge
23 measurement timing is on the predictor versus the
24 response timing of that recharge to that spring.

25 Q. And so if you've identified concerns about the

1 R-squared relationship at Box Canyon and the use of
2 Box Canyon as a part of the forecasted water supply,
3 until a change is made, how would you respond to this
4 uncertainty?

5 A. I think the Department has responded to that
6 uncertainty, and that's, you know, one of the reasons
7 that they take the standard deviation below in favor of
8 the Surface Water Coalition. They -- any uncertainty
9 they have taken there, that's how they address it.

10 Q. So with those additional questions that you've
11 raised or uncertainty that you've raised with respect to
12 Box Canyon, would you agree that taking a conservative
13 approach is warranted?

14 A. I think that's the Department's discretion in
15 terms of how they want to take that approach, and
16 they've chosen a wide margin on how much conservatism or
17 bias that they want to -- that they've applied there.
18 So it's, in my opinion, one standard deviation is very
19 significant in terms of the reduction.

20 Q. Sophia, if you could turn to page 34 of your
21 report.

22 A. Would you mind giving me a section header?

23 Q. Yeah. On page 34 of your report. At the top
24 of that page, you discuss -- or state that: [As read]
25 "the ESPAM transmissivity does not fit the

1 hydrogeological characteristics of the near Blackfoot to
2 Minidoka reach region."

3 Do you see that at the top of the page?

4 A. Is that the paragraph right above
5 Section 3.4.3?

6 Q. It is.

7 A. Yeah.

8 Q. So can you explain to me why that
9 transmissivity does not fit?

10 A. Sure. So if we look at the Figure 33 --
11 3-3 -- and this was something that was criticized or
12 brought to the Department's attention in the Ralston
13 report that was prepared for them, which I think would
14 have been referring to ESPAM1.1, based on the date of
15 that, but I think you can see it has persisted in all of
16 these.

17 And, essentially, it's that if you just look
18 at where the American Falls Reservoir is positioned in
19 terms of the transmissivity, it's in a pretty high -- so
20 the transmissivity values on these, the darker color,
21 the higher the transmissivity is.

22 And so you can see that in all of these models
23 kind of in the vicinity of that American Falls reach,
24 it's of those higher transmissivity colors, and the
25 geology, basically, the presence of these interfingering

1 impermeable units would specify that you should have
2 lower transmissivity in that American Falls area and to
3 the southwest.

4 And that's, you know, a function of what
5 causes the discharge to that near Blackfoot to Neeley
6 reach to come up before the reservoir. Basically, all
7 the springs are kind of -- to the -- to the east.

8 Q. And is part of your opinion based upon the
9 fact that we have a single-layer model instead of a
10 multilayer model?

11 A. Yes. I mean, that's separate from just the
12 comment on the transmissivity. But perhaps the
13 inappropriate -- perhaps that if the model had the
14 multiple layers that it should in that area, the
15 transmissivity would work itself out.

16 Q. Is it ever appropriate to represent a
17 multilayer geologic system with a single-layer
18 groundwater model?

19 A. In my professional career, and I've built a
20 lot of models, I've never built a single-layer model,
21 even when I'm doing -- representing an alluvial aquifer
22 system on a short reach of river. Because I was taught
23 that even in just an alluvial environment, the vertical
24 hydraulic conductivity is less than the horizontal
25 hydraulic conductivity, I will have multiple layers so

1 that I can represent that anisotropy.

2 Q. Do you know why ESPAM uses a single layer?

3 A. I've heard the Department talk about maybe
4 they don't have the data to support multiple layers.
5 But, you know, in my review of just kind of the
6 information that's available out there, there's some
7 hydrogeologic studies done for the RASA project, which
8 is Regional Aquifer-System -- I can't remember exactly.
9 But back in the '90s, they had, you know, I think a
10 four-layer model of the Eastern Snake Plain. So it's
11 really at the modeler's discretion.

12 Q. And is that an issue you bring up in the
13 modeling committee that you're a part of?

14 A. Yes.

15 Q. Does the MODFLOW river package allow for the
16 representation of low permeability impacts of fine grain
17 sediments in the area in the Black- -- near Blackfoot to
18 Minidoka area?

19 A. MODFLOW is capable of representing multiple
20 layers, and you can parameterize those to represent
21 those impermeable characteristics.

22 In particular, ESPAM2.2 moved to a version of
23 MODFLOW that's called MODFLOW USG, which stands for
24 unstructured grain. And it's very -- it's very
25 flexible, in that it allows you to put in layers in just

1 certain parts of the aquifer. It doesn't have to be
2 across the whole region.

3 Q. Right. So the river package can control the
4 interactions of the river and the reservoir?

5 A. Yes. The river package has a conductance
6 value that, exactly that, is very controlling in terms
7 of how it interacts with the groundwater -- the regional
8 groundwater levels.

9 Q. So with respect to the near Blackfoot to
10 Minidoka reach, is this how the interactions with
11 respect to reach gains are represented in that area?

12 A. I mean, the boundary conditions as they're --
13 as they exist in MODFLOW are implemented throughout the
14 model and including this reach.

15 Q. Sophia, in your testimony you discussed
16 confidence in ESPAM2.2 predictions in the near Blackfoot
17 to Minidoka reach gain, and you make comparisons between
18 ESPAM2.1 and 2.2 --

19 A. Yes.

20 Q. -- I believe specifically stating that those
21 differences in reach gain predictions indicate
22 uncertainty in the model.

23 Is that your testimony?

24 A. Yes. I think they're a reflection of
25 uncertainty that we have in aquifer parameters and water

1 budget components.

2 Q. But aren't those differences due primarily to
3 improvements in 2.2 from 2.1 that more accurately
4 calculate reach gains?

5 A. I think that there are localized improvements
6 that were done in ESPAM2.2, so I think that's true. But
7 I don't think that -- I don't think that that is -- I
8 think it's separate from just kind of general model
9 uncertainty that we have in prediction from these other
10 components; like model -- like conceptual uncertainty
11 and input parameter uncertainty, they still exist.

12 Q. Would you agree that we're going to always
13 have some level of uncertainty when we're dealing with a
14 model?

15 A. I agree with that. What I'm highlighting in
16 my report here is very specific issues around water
17 budget components for consumptive use and a known
18 problem that will impact the response to this reach in a
19 similar fashion that was, you know, a change that we saw
20 from 2.1 to 2.2.

21 Q. So do you have a recommendation for a better
22 way to estimate near Blackfoot to Minidoka reach gains?

23 A. I think my recommendation, which is, you know,
24 something that the Department puts in their calibration
25 report, is that because we have this model uncertainty,

1 that uncertainty should be taken into account when using
2 it in water resource applications and administration.

3 And so I think in my report I'm advocating to
4 consider a trim line as a potential -- a potential to
5 just recognize that there is uncertainty in some of
6 the -- in the prediction that we're making.

7 Q. So you've used this term "trim line." What's
8 your definition of a trim line?

9 A. I think in applications that I'm familiar
10 with, it's often based on a response to the reach or a
11 feature. Like, I think in Rangen, they used the Great
12 Rift where the response beyond that feature they have
13 less certainty in.

14 Q. So with respect to the application of a trim
15 line, do you think that junior groundwater pumpers are
16 responsible for mitigating their impacts to senior
17 surface water rights?

18 MS. PATTERSON: Object. Objection. This is
19 outside the scope of her report, and it calls for --

20 HEARING OFFICER: Am I hearing an objection?

21 MS. PATTERSON: Yes. Objection. Sorry.

22 HEARING OFFICER: You'll need to speak up
23 loudly, I think.

24 MS. PATTERSON: It's outside the scope of her
25 report, and it calls for a legal conclusion.

1 MR. SIMPSON: Well, Mr. Director, she's
2 testifying as to her perspective or her testimony
3 regarding the application of a trim line, and that's
4 what my question was based upon.

5 HEARING OFFICER: Overruled.

6 Answer the question, please, Ms. Sigstedt.

7 THE WITNESS: Can you repeat the question.

8 Q. (BY MR. SIMPSON) You testified a few moments
9 ago about the application of a trim line, and my
10 question that I asked you was: Do you believe that
11 junior groundwater pumpers are responsible for
12 mitigating their impacts to senior surface water rights?

13 A. I think that water users are, you know, ruled
14 by state administration's rules.

15 Q. So if it's determined that junior groundwater
16 pumping is impacting a senior surface water right, then
17 they would have the obligation to mitigate for that
18 impact?

19 A. I mean, however that's determined. Like I
20 said, a trim line has been used with the ESPAM model in
21 previous rulings and, you know, however that's applied
22 or not applied is what the obligation is.

23 MR. SIMPSON: That's all the questions I have.

24 HEARING OFFICER: Did you have further
25 cross-examination, Mr. Fletcher?

1 MR. FLETCHER: Yes, I have just two lines of
2 TJ's version of 30 minutes from yesterday, if that's
3 okay, unless you want to break right now.

4 HEARING OFFICER: What does everybody want to
5 do? I'm sure we'll have some redirect.

6 MS. PATTERSON: We will have some redirect,
7 but we're happy to have Kent do this questioning.

8 HEARING OFFICER: I just wonder whether we can
9 get through Ms. Sigstedt before lunch. My guess is we
10 will end up with a late lunch.

11 Let's break right now and come back a quarter
12 after and you may ask your questions then, Mr. Fletcher.

13 So let's break for lunch and come back in an
14 hour, at a quarter after 1:00. Thank you.

15 (Break taken.)

16 HEARING OFFICER: We're recording again after
17 the lunch recess.

18 Mr. Fletcher, you may cross-examine
19 Ms. Sigstedt.

20 MR. FLETCHER: Ms. Sigstedt, are you on the
21 phone?

22 HEARING OFFICER: Perhaps she's not.

23 MR. FLETCHER: Unless the name's changed.

24 THE WITNESS: Can you hear me? Can you hear
25 me?

1 MR. FLETCHER: There you are.

2 HEARING OFFICER: There you are.

3

4 CROSS-EXAMINATION

5 QUESTIONS BY MR. FLETCHER:

6 Q. Good afternoon. My name is Kent Fletcher. I
7 represent Minidoka Irrigation District and American
8 Falls Reservoir District 2, and I just have two areas
9 I'd like to ask you a few questions concerning.

10 And the first one is, in this proceeding,
11 there's been a lot of discussion about the number of
12 acres of the SWC members and how they're calculated and
13 that, as I understand your report, you believe the
14 number of acres in the methodology are overstated for
15 Twin Falls Canal Company; isn't that correct?

16 A. That's correct.

17 Q. But one thing that hasn't been discussed at
18 all is if the number of acres are changed, don't other
19 changes have to be made to the methodology?

20 How does the change in the number of acres
21 affect the methodology?

22 A. It's used in the calculation of crop water
23 need.

24 Q. Where else is it used?

25 A. That's the main thing that I can think about.

1 Q. Is it used in the determination of project
2 efficiency?

3 A. I think project efficiency is calculated using
4 crop water need and the diversions, so I think the
5 change to crop water need affects the project efficiency
6 calculation.

7 Q. And the crop water need is based upon acreage,
8 correct, to some degree?

9 A. Correct.

10 Q. So if you went back -- if you change the
11 number of acres, you'd have to recalculate the
12 efficiency of the entity; correct?

13 A. So in my report, I'm changing the value of the
14 acres using the Department's reasonable in-season demand
15 sheet. And I believe I can see it changing the
16 calculation of the project efficiency in there. So in
17 the example I provide, I think that is taken care of,
18 unless I'm missing something.

19 Q. Well, you said that the use of a different --
20 of the higher acres number creates what you referred to
21 as an erroneous shortfall; correct?

22 A. Correct.

23 Q. But if you adjusted efficiency to take into
24 account the adjustment in acres and the same amount of
25 water was diverted, the shortfall would be the same;

1 isn't that correct?

2 A. I mean, it doesn't seem so. I do see the
3 project efficiencies go down when I change the irrigated
4 acres, but I'm still calculating a difference in the
5 shortfall.

6 Q. How much would it adjust the shortfall?

7 A. We can look at my table. So if you look at
8 page 27 of Exhibit 387, I have recalculated the
9 shortfall changing the irrigated acres for Twin Falls
10 Canal Company in the reasonable in-season demand
11 calculation sheet, which, like I said, it seems to be
12 changing the project efficiency. And those are the
13 shortfalls, the difference.

14 Q. Did you recalculate the efficiency as part of
15 that?

16 A. Like I said, to me, they seem to be updating
17 in the sheet as a function of the crop water need, so I
18 do see a change in the project efficiency.

19 Q. So that was really the point I was trying to
20 make. It is true that if you do redo the acres, you
21 have to adjust the project efficiency as well as the
22 crop water need; correct?

23 A. That's how the calculation sheet works, to my
24 understanding.

25 Q. The other area I would like to go into dealt

1 with the transient versus steady state analysis. I'm a
2 little unclear on what your opinion is concerning the
3 use of the steady state.

4 I believe your testimony when Mr. Simpson was
5 questioning you was that the transient model run was the
6 only way to determine how much water would be available
7 in the reach during the year of need. Wasn't that
8 correct?

9 Isn't that your testimony?

10 A. If you're trying to determine the amount of
11 water May through September of the current year, the
12 transient model is the only model that can give you that
13 answer.

14 Q. So if your goal is to furnish the amount of
15 shortage to the injured party during that year, you have
16 to use the transient model; correct?

17 A. That's the way to get that model output.

18 Q. And if you use the steady state model run to
19 do the same calculation, the injured party would only
20 receive about 15 percent of the shortfall in that year;
21 isn't that correct?

22 A. I think it varies by curtailment date in terms
23 of the percentage.

24 Q. Well, you reviewed Jennifer Sukow's
25 information; correct?

1 A. Correct.

2 Q. And do you remember the information that she
3 provided? I think it said that either 15 percent or 9
4 to 15 percent appears in the year of curtailment?

5 A. Yes, that range is what I'm referring to --

6 Q. Okay.

7 A. -- that the --

8 COURT REPORTER: Ms. Sigstedt, I'm sorry. I
9 missed some of that again. I got, "Yes, that range is
10 what I'm referring to"?

11 THE WITNESS: I think that that range was
12 developed based on analyzing different curtailment dates
13 and looking at the comparison of the transient -- the
14 in-season to the steady state response.

15 Q. (BY MR. FLETCHER) Do you believe that the
16 goal of the methodology should be to protect seniors
17 from injury caused by junior diversions?

18 A. I think that that sounds correct.

19 Q. And do you agree that if injury is determined,
20 the shortfall should be supplied in time, location, and
21 amount that season?

22 A. To me, that seems like, potentially, a policy
23 decision. I don't know if it's a technical question.

24 Q. So you don't have an opinion on that?

25 A. My opinion is that it's a policy decision.

1 MR. FLETCHER: Thank you.

2 I don't have any further questions.

3 HEARING OFFICER: Okay. Thank you,
4 Mr. Fletcher.

5 Redirect, Ms. Patterson?

6 MS. PATTERSON: Yes. Just a moment.

7 HEARING OFFICER: Do you want to go off the
8 record?

9 MS. PATTERSON: No. I'll be short.

10

11

REDIRECT EXAMINATION

12

QUESTIONS BY MS. PATTERSON:

13

Q. Hi, Sophia. Before lunch, you were asked by
14 Mr. Simpson whether or not you were saying the model
15 should be used given the uncertainty, and I think you
16 replied that it's what we have, and so, yes, it should
17 be used.

18

I just want to clarify, are you saying that it
19 can be used but you need to account for the uncertainty?

20

A. That's correct.

21

Q. And then there was questions about irrigated
22 acres and whether or not in 2013 the Department should
23 have used the self-reported numbers.

24

You commented that, no, that one shouldn't be
25 used because it hasn't been verified; is that correct?

1 A. That's correct.

2 Q. Could you envision a process such as the
3 Department using the most recent data available for
4 irrigated acres, such as the Landsat data that they use
5 in the model, and then the districts, if they find an
6 error with that, could produce that -- produce that
7 evidence to the Department if they want to contend that
8 the data, the Landsat data excludes irrigated or
9 semi-irrigated acres?

10 A. Yes, I think that makes sense, and I also
11 think that in the application of those acres, there is
12 the semi-irrigated acres category that I think is just
13 being treated as irrigated acres. I think, similarly,
14 you can make a determination of the percent of the
15 semi-irrigated acres that are nonirrigated.

16 Q. Thank you.

17 That brings me to my last question which is,
18 again, related to the Landsat data. That includes
19 irrigated, semi-irrigated, and nonirrigated acres; is
20 that correct?

21 A. That's correct.

22 Q. And if we look at --

23 A. The irrigated lands dataset is the one that
24 has those classifications.

25 Q. Thank you, the irrigated lands dataset.

1 Going to Table 2-3, where it discusses the
2 different ways to calculate irrigated acres, in that
3 chart do you know whether that -- those numbers include
4 both irrigated acres and semi-irrigated, or is it only
5 counting irrigated?

6 A. I'm pretty sure, from the testimony that we
7 heard from Matt, it is including the semi-irrigated.

8 Q. Okay. That is what I recall as well. Thank
9 you.

10 MS. PATTERSON: That's all.

11 HEARING OFFICER: Recross, Mr. Simpson?

12 MR. SIMPSON: No.

13 HEARING OFFICER: Mr. Fletcher?

14 MR. FLETCHER: No.

15 HEARING OFFICER: I just have one question for
16 Ms. Sigstedt.

17

18 EXAMINATION

19 QUESTIONS BY THE HEARING OFFICER:

20 Q. Ms. Sigstedt, I am looking at page 23 under
21 Section 2.2.2, and the beginning of the second
22 paragraph, it says: "The first is that Box Canyon
23 spring flows are representative of groundwater discharge
24 to the near Blackfoot to Minidoka reach."

25 Is that your testimony?

1 A. No, that looks like a typo. It should be "are
2 not representative."

3 Q. Okay. And it may be just in the context of
4 that statement, because in the previous paragraph it
5 says: "I have additional concerns about two of the
6 predictions," but then, again, it very clearly states
7 that they are representative, and you're saying that it
8 should say "is not"; is that correct?

9 A. That's correct.

10 Q. Okay.

11 A. I also noticed a typo on the curtailment date
12 under the figure -- under the last figure also. So I
13 think there could be some minor corrections.

14 Q. Under what figure?

15 Well, if you don't recall, maybe you can
16 correct it through your counsel. I just noticed this
17 particular sentence and thought it was not consistent
18 with your testimony, and I wanted to ensure that at
19 least the document reflected and was consistent with
20 your testimony.

21 A. I really appreciate that.

22 And the other one is Figure 10. 3-10 has a
23 typo in the curtailment date.

24 MS. PATTERSON: Counsel will see to it that
25 those changes are updated and it's submitted to the

1 Department.

2 HEARING OFFICER: You'll have to speak up,
3 Ms. Patterson.

4 MS. PATTERSON: Counsel will work with Sophia
5 to make sure those corrections are accounted for and
6 submitted to the parties in the Department.

7 HEARING OFFICER: Okay.

8 All right. Thank you, Ms. Sigstedt.

9 THE WITNESS: Thank you.

10 HEARING OFFICER: The next witness I have in
11 my list is Jaxon Higgs. He is not here, I assume, and
12 doesn't have connections in some remote location in
13 Mexico, Mr. Budge?

14 MR. BUDGE: That's correct.

15 HEARING OFFICER: So we don't anticipate
16 hearing from Mr. Higgs.

17 MR. BUDGE: No.

18 HEARING OFFICER: And the next witness I show
19 is Bryce Contor.

20 MR. BUDGE: I think we're going to put Lynn
21 Carlquist on next.

22 HEARING OFFICER: Okay. Mr. Carlquist, if
23 you'll come forward, please.

24 THE WITNESS: Right here.

25 HEARING OFFICER: We'll switch back to our

1 regular configuration which you have not observed.

2 Will you raise your right hand, please.

3
4 RICHARD LYNN CARLQUIST,

5 called by IGWA, having been first duly sworn to tell the
6 truth relating to said cause, testified as follows:

7
8 HEARING OFFICER: Thank you. This chair may
9 feel comfortable to you, given your long history.

10 THE WITNESS: Not our first go-round.

11 HEARING OFFICER: Okay. Mr. Budge.

12
13 DIRECT EXAMINATION

14 QUESTIONS BY MR. BUDGE:

15 Q. Thank you.

16 Lynn, thank you for being here today. Just to
17 begin, will you please state your name and address for
18 the record.

19 A. Richard Lynn Carlquist, 1092 South 2500 East,
20 Hazelton, Idaho 83335.

21 Q. You're here to testify today, Lynn, on behalf
22 of Idaho Ground Water Appropriators?

23 A. Yes.

24 Q. What's your current position with IGWA?

25 A. I am the co-chair of IGWA organization,

1 serving with Stephanie Mickelsen as the other co-chair.

2 Q. How long have you been involved with IGWA?

3 A. Since the mid-2000s. 2005 our groundwater
4 district joined.

5 Q. And can you identify who IGWA's groundwater
6 district members are?

7 A. Yeah, if I look them up, I could go -- try and
8 go through them, but there's nine districts and one
9 irrigation district that is members of IGWA.

10 Q. I'll make it easy for you, Lynn. I'll just go
11 through them and then have you confirm.

12 There is North Snake Groundwater District,
13 Carey Valley Groundwater District, Magic Valley Ground
14 Water District, Aberdeen-American Falls Groundwater
15 District, Bingham Groundwater District, Jefferson Clark
16 Groundwater District, Henry's Fork Groundwater District,
17 and Madison Groundwater District.

18 Does that sound right?

19 A. That sounds right. I think that's all of
20 them.

21 Q. And Southwest Irrigation District is also a
22 member of IGWA?

23 A. Yes.

24 Q. I understand you are a member, personally, of
25 North Snake Groundwater District?

1 A. That's correct.

2 Q. How long have you been a member of that
3 district?

4 A. Since its inception.

5 Q. Do you serve as a director of that district?

6 A. Yes.

7 Q. And as the chairman?

8 A. Yes.

9 Q. How long have you been the chairman?

10 A. Ten years.

11 Q. Where is North Snake Groundwater District
12 located?

13 A. It's located in Jerome County, Gooding County,
14 and Blaine -- or Shoshone County.

15 Q. And it represents groundwater irrigators in
16 that area?

17 A. Yes.

18 Q. Are there also nonirrigator members of the
19 district?

20 A. Yes.

21 Q. Just describe some of the nonirrigation uses
22 that are in the district.

23 A. Some of the cheese-processing plants are some
24 of the bigger users of water. Amalgamated Sugar has
25 some use of water. Other cities, municipalities have

1 water rights that belong to our district.

2 Q. And I understand there's a lot of dairy
3 operators in your district as well?

4 A. There are a lot.

5 Q. How many acres, approximately, are irrigated
6 by members of your district?

7 A. There's a little over 200,000, 202,000 acres,
8 irrigated acres in our district -- or 102,000 irrigated
9 acres in our district.

10 Q. Okay. And, generally, what types of crops are
11 grown in your district?

12 A. Well, the big crops now are alfalfa, corn.
13 There are still potatoes, sugar beets, beans, small
14 grains. Some specialty crops are grown, some seed
15 crops.

16 Q. And how much water do patrons of your district
17 divert on a per-acre basis typically?

18 A. The diversion now, we average about -- from
19 our -- the groundwater is 2.2 acre-feet a year.

20 Q. And I understand that your district limits how
21 much groundwater the patrons are permitted to divert?

22 A. Yes.

23 When the Surface Water Coalition plan was
24 formulated and put into place, each groundwater district
25 was given an amount of reduction that belonged to their

1 district; and we set up a system whereby a set of
2 priorities each individual water right was given a set
3 amount that they could divert.

4 Q. And that's 2.2 acre-feet in your district?

5 A. The priorities range from 2.4 to 2. And we
6 average, roughly, that 2.2 right now.

7 Q. Okay. So more senior rights in your district
8 are allotted a higher volume than more junior rights?

9 A. That's correct.

10 Q. And your district sends out to each patron the
11 volume of water it's allowed to use, and they're
12 responsible to stay within that amount?

13 A. Yes.

14 Q. Are you aware of other groundwater districts
15 also imposing diversion limits on their members?

16 A. Yes.

17 Q. Compared to other groundwater districts, are
18 North Snake's diversion limits higher or lower than
19 others?

20 A. Generally higher.

21 Q. The other districts have lower diversion
22 limits than your district?

23 A. Yes.

24 Q. I understand you, personally, own groundwater
25 rights in the district?

1 A. Yes.

2 Q. And you also own surface water rights?

3 A. Yes.

4 Q. Where does your surface water come from?

5 A. I have surface water rights with A&B

6 Irrigation District, North Side Canal.

7 Q. Does A&B Irrigation District regulate how much
8 water you can divert under your surface water rights?

9 A. Yes.

10 Q. How does that work?

11 A. We're given so many acre-feet a year that we
12 can pump. If we go beyond that, then we get charged a
13 surcharge for the additional acre-feet that we pump.

14 Q. Okay. Does North Side Canal Company regulate
15 how much surface water you can divert?

16 A. Their water right is based on a diversion
17 rate, not a consumptive amount.

18 Q. So you're just able to divert your rate all
19 season long?

20 A. Yes, if you want to, you can.

21 Q. Okay. Let me ask you some questions about the
22 Fifth Methodology Order that was issued April 21st of
23 this year.

24 Lynn, are you aware that among other changes
25 to the Fifth Methodology Order, the Director changed

1 from a steady state to a transient state application of
2 the ESPA model?

3 A. Yes, I'm aware of that.

4 Q. Did you know what effect a transient state
5 would have on curtailments?

6 A. Well, we talked about it a lot. We didn't
7 know exactly the impact that it would have, but we knew
8 it would be a major change from the steady state
9 analysis that had been done. And we thought for sure,
10 based on where our groundwater district is, there would
11 be less of an impact; but, in fact, you know, it -- the
12 curtailment for our district is about the same as
13 everybody else.

14 Q. You're aware that also in April this year the
15 Director issued what we call an As-Applied Order that
16 sets a curtailment date of December 30th, 1953?

17 A. Yes.

18 Q. Did you anticipate a curtailment happening
19 this year?

20 A. No.

21 Q. Why not?

22 A. With the larger than average snowpack that we
23 had and what we'd had in previous years, we did not
24 anticipate that there would be a curtailment order
25 issued.

1 Q. So it came as a surprise to members of your
2 district when the curtailment was issued?

3 A. Yes.

4 Q. And have your patrons complained about that
5 revelation?

6 A. Complained? They've asked questions. They
7 want to know why and what they can do and what the
8 impact will be.

9 Q. Your patrons also weren't anticipating a
10 curtailment this year?

11 A. I don't think so.

12 Q. Lynn, let me have you turn, in one of those
13 white binders behind you, to Exhibit 829.

14 Do you recognize that document, Lynn?

15 A. Yes, I've seen this.

16 MR. BUDGE: And just for the record, I'll
17 represent that Exhibit 829 is a duplication of
18 Figure 3-1 in the expert report of Sophia Sigstedt,
19 which has been admitted into evidence as Exhibit 837.

20 Q. (BY MR. BUDGE) Lynn, you mentioned that
21 you've seen this before. What do you understand this
22 exhibit shows?

23 A. Well, in the left portion of the exhibit, it
24 shows IGWA's -- IDWR's percentage of IGWA's
25 proportionate share, and that was based more on a type

1 of steady state type of analysis, is my understanding.

2 And the midsection shows the impact of water
3 that would be made available under curtailment based on
4 the transient state analysis.

5 Q. So if we look at the row for North Snake,
6 that's North Snake Groundwater District; correct?

7 A. Yes. We're on the very bottom.

8 Q. If we look at the middle section of that
9 spreadsheet, it shows that the curtailment would
10 eliminate beneficial use of 217,151 acre-feet.

11 Do you see that?

12 A. Yes.

13 Q. Do you understand that to be the curtailment
14 within your district?

15 A. Based on the December 30th, 1953, date?

16 Q. Correct. And then the model benefit to the
17 Coalition from May to September would be 0.06 acre-feet?

18 A. Yes.

19 Q. Did that come as a surprise to you?

20 A. Yes. It's much lower than I thought it would
21 have been.

22 Q. And does this change how North Snake handles
23 groundwater management for its patrons going forward?

24 A. Well, it probably will. I've had patrons
25 call, and, of course, they have rights junior to 1953.

1 And if you look over further, it shows that 88,000 acres
2 are junior to that, so they're concerned "Are we going
3 to be curtailed?" And I -- under the way we used to
4 mitigate for an order, was supplying wet water prior to
5 the Surface Water Coalition call -- or agreement that we
6 entered into. And I told them we will be able to supply
7 the necessary water to meet our obligation under this
8 curtailment order.

9 Q. Which would be a very small fraction?

10 A. A very small -- less than 1 acre-foot.

11 Q. Have your patrons continued to conserve water
12 this year -- or I should rephrase that.

13 Has your district continued to send out the
14 diversion reduction obligations this year like you've
15 done in the past?

16 A. We have. And at our annual meeting, I told
17 them that we were going to do that, and we asked if
18 everyone was okay with that, that was at the meeting,
19 and they said yes. And we will continue to do our
20 reductions that we've been doing in the past under the
21 Surface Water Coalition Act.

22 Q. Okay. And that's intended to stabilize the
23 aquifer in your area?

24 A. That's what our intent is.

25 Q. It's not, necessarily, a representation of

1 your obligations under the -- this table that we've just
2 seen?

3 A. No.

4 MR. BUDGE: No further questions.

5 HEARING OFFICER: Okay. Cross-examination?

6 Mr. Simpson or Fletcher?
7

8 CROSS-EXAMINATION

9 QUESTIONS BY MR. FLETCHER:

10 Q. Hi, Mr. Carlquist. How are you doing?

11 A. Oh, pretty good.

12 Q. I'm Kent Fletcher, as you know. We've dealt
13 with each other for many years. And on behalf of our
14 clients, I'd like to thank your district for the actions
15 you've taken over the years pursuant to our plan.

16 I -- first of all, you mentioned briefly some
17 of the operations for your district. You heard the
18 testimony of Jay Barlogi yesterday -- were you sitting
19 in on that?

20 A. I was not, I didn't hear it.

21 Q. I'll represent to you that he said that Twin
22 Falls Canal Company employs -- his written testimony
23 states that the Twin Falls Canal Company employs
24 somewhere around 65 employees, 24 ditch riders to
25 monitor water deliveries. And that's for somewhere

1 between 180-, 195,000 acres, whatever number is
2 determined. You said you had about 100,000 acres of
3 groundwater that you manage in your groundwater
4 district; correct?

5 A. I would say we don't manage it, but we have
6 initiated programs for the members of our district who
7 have those groundwater rights. We don't own any
8 groundwater rights as a groundwater district, and I
9 wouldn't say that we manage it, but we give them plans
10 and operations that will help meet the obligations that
11 come because of water calls.

12 Q. Does your district monitor in-season
13 diversions of groundwater?

14 A. No.

15 Q. Does your district take any action against
16 groundwater users who overdivert the allocation you
17 talked about?

18 A. We do.

19 Q. And what do you do?

20 A. We have gone to the program where they are
21 required to pay \$100 per acre-foot. There is actually
22 an averaging system that is set up, that Jaxon Higgs
23 helped us put into place, where they can make up in a
24 following year for overages in a previous year. But if
25 after a three-year period of time they don't make it up,

1 then they have to pay the difference in acre-feet, \$100
2 per acre-foot.

3 Q. And the only reporting concerning the
4 diversions that take place in your district occurs after
5 the season has ended; is that correct?

6 A. That's correct.

7 Q. I was a little confused about your actions.

8 Is your district -- you mentioned the 2015
9 agreement a few times. Is your district still honoring
10 the 2015 mitigation plan and the order that was entered
11 pursuant to that?

12 MR. BUDGE: Objection. Beyond the scope of
13 this proceeding.

14 HEARING OFFICER: I don't -- I don't think so.
15 He testified about the actions that were taken by North
16 Snake. This is clarification.

17 MR. FLETCHER: Right.

18 HEARING OFFICER: Overruled.

19 MR. BUDGE: Objection. Calls for a legal
20 conclusion.

21 HEARING OFFICER: Overruled again.

22 MR. BUDGE: Mr. Director, can I inquire of the
23 witness in aid of objection?

24 HEARING OFFICER: Sure.

25 MR. BUDGE: And I'll just stand here.

1 Mr. Carlquist, do you understand that the
2 dispute has arisen between IGWA and the Surface Water
3 Coalition over the terms of the 2015 settlement
4 agreement?

5 THE WITNESS: Now, say that again.

6 MR. BUDGE: Do you understand that a dispute
7 has arisen between IGWA and the Surface Water Coalition
8 over the terms of the 2015 settlement agreement?

9 THE WITNESS: Yes.

10 MR. BUDGE: Do you understand that dispute is
11 presently on appeal?

12 THE WITNESS: Yes.

13 MR. BUDGE: That dispute has not finally been
14 resolved?

15 THE WITNESS: That's my understanding.

16 MR. BUDGE: And your understanding of the
17 terms of that agreement are different than the Surface
18 Water Coalition's understanding of the terms of that
19 agreement?

20 THE WITNESS: That has been the case.

21 MR. BUDGE: Mr. Director, Mr. Fletcher is
22 asking the witness to testify as to whether he's in
23 compliance with the agreement. The witness can't do
24 that, given that the terms of the agreement have not
25 fully been adjudicated.

1 HEARING OFFICER: Mr. Carlquist can testify
2 about whether he believes he's complying or not.

3 Overruled.

4 Mr. Fletcher.

5 MR. FLETCHER: Let me reask the question
6 because that wasn't my question, and I'm not looking for
7 past breaches or these issues that Mr. Budge is talking
8 about.

9 Q. (BY MR. FLETCHER) What I'm talking about is
10 this year, 2023, is your district planning on attempting
11 to comply with the 2015 settlement agreement and the
12 order that was entered?

13 A. That had been the case that we were going to
14 try and do. What was frustrating was the fact that we
15 found out that even if we do it, if other members of the
16 IGWA don't comply, then we're also out of compliance, so
17 we don't know where we're going to go.

18 Q. So that's your understanding is that your
19 district could comply, but if your -- if other districts
20 don't, then all of you will be out of compliance?

21 A. That's my understanding.

22 Q. So you're not sure if you're going to attempt
23 to comply with that yet, as I understand it?

24 A. At our annual meeting, I made the suggestion
25 to the members of our district that we would still do

1 our share of compliance of that agreement, and our plan
2 was to do that; but if doing that will not bring us any
3 satisfaction, then I'm not sure what direction we'll go
4 now.

5 Q. I understand that.

6 Is it your belief that if you do comply with
7 the mitigation plan and are found to be in compliance
8 with the mitigation plan, that your district then would
9 have safe harbor?

10 A. No. My understanding is we will not.

11 Q. No, I say if you were in compliance with the
12 mitigation plan, if you believed you were, and if the
13 Director found you were in compliance with the
14 mitigation plan, your district, then you would have safe
15 harbor?

16 A. I don't know that we would. I don't think
17 anyone's told us that we can do it individually and
18 receive safe harbor.

19 Q. If you did have -- if you were found to be
20 complying with the mitigation plan and order that is in
21 place now, you would have safe harbor?

22 MR. BUDGE: Objection. Director, I'm going to
23 renew my objection. This case is involving the Fifth
24 Methodology Order and the As-Applied Order. We have a
25 separate proceeding involving the mitigation plan past

1 compliance and mitigation compliance for 2023, and I
2 don't think it's appropriate in this proceeding for
3 Mr. Fletcher to ask the questions that he would like to
4 have answers to in other proceedings.

5 HEARING OFFICER: And, Mr. Budge, your direct
6 examination opened up this particular subject.

7 Mr. Fletcher is exploring it. Overruled.

8 Q. (BY MR. FLETCHER) Do you remember my
9 question?

10 A. Do it again.

11 Q. All right. If you were found to be in
12 compliance with the mitigation plan this year, then the
13 mitigation plan states you would have safe harbor;
14 correct?

15 A. Well, the agreement says we would have safe
16 harbor, but my understanding is from decisions that have
17 come from the Department, from the Director, is the fact
18 that if everyone is not in compliance, then no one is
19 going to be in compliance.

20 Q. And if you had safe harbor, then none of your
21 irrigators would be subject to curtailment regardless of
22 what the curtailment date is; correct?

23 A. That's correct.

24 Q. You brought up this table -- or your counsel
25 brought up this table that Jaxon Higgs prepared. I

1 think you still have it in front of you; is that
2 correct?

3 A. I do.

4 Q. I was a little unclear about your testimony on
5 that. It does show that in a one-year transient state
6 analysis that North Snake would have to contribute a
7 very small amount of water?

8 A. Yes.

9 Q. Is that correct?

10 A. That's correct.

11 Q. Are you -- is it your position as president of
12 IGWA that those who contribute more to the shortage this
13 year should mitigate for that, and those who contribute
14 less mitigate their share?

15 A. That decision has not been made by IGWA.

16 Q. Is that your position as the president of your
17 groundwater district?

18 A. No, it's not.

19 Q. What is your position concerning a mitigation
20 requirement for this year?

21 A. We, as a group of groundwater districts, would
22 have to get together and determine how any obligation
23 would be shared. And that hasn't been done yet.

24 Q. So it has not been done yet?

25 A. No.

1 MR. FLETCHER: That's all the questions I
2 have. Thank you, Mr. Carlquist.

3 HEARING OFFICER: Any further cross?
4 Mr. Simpson?

5
6 CROSS-EXAMINATION

7 QUESTIONS BY MR. SIMPSON:

8 Q. Lynn, good afternoon. John Simpson
9 representing A&B, et al. Good to see you again. I just
10 had a couple follow-ups to your direct testimony.

11 First, you indicated on direct that you
12 thought since it was a good snowpack, that there
13 wouldn't be a curtailment this year; is that fair?

14 A. That would be -- that was my thought, that the
15 snowpacks were large enough, you know, and, of course, I
16 was surprised when I understood that the -- those who
17 measure said that possibly the system would not totally
18 fill, even with the snowpack that we had, because there
19 were certain areas, Jackson Lake area, for example,
20 didn't have quite the snow that other areas did.

21 Q. Yeah. And given that you receive North Side
22 Canal Company water; correct?

23 A. Yes.

24 Q. As the reservoir system declines in its
25 carryover, that, obviously, means you need a better

1 snowpack in order to fill the reservoirs; correct?

2 A. Yes.

3 Q. And so that's part of the reason why --

4 A. It also depends on how the water comes off of
5 that system up there to fill the reservoir.

6 Q. You bet. Understand that.

7 So in your experience, even if you have a good
8 snowpack, it doesn't necessarily ensure that surface
9 water users have a full water supply; is that fair?

10 A. You can't guarantee it, but it's certainly a
11 better chance, we thought, that they would have a full
12 water supply on a year like this.

13 Q. And so with respect to your groundwater rights
14 and your pumps and where those pumps are on the North
15 Snake groundwater system, what have you observed in
16 terms of your groundwater levels over the last couple
17 years?

18 A. In the last couple years, they've gone back
19 down. In the prior 10 or 12 years, they've come up
20 fairly dramatically. And then the last two years,
21 they've declined a little bit again.

22 Q. When you say "a little bit," 10 feet?
23 15 feet?

24 A. 3 feet.

25 Q. So in those prior years since 2015, what kind

1 of increase did you see?

2 A. We went up almost 12 feet. And that's the
3 first time they've gone up since the '80s.

4 Q. So you saw about a 25 percent decline over the
5 last couple years?

6 A. Yes.

7 Q. So when you were asked on direct testimony
8 that you're anticipating to continue your reductions in
9 order to stabilize the aquifer -- do you recall that
10 testimony?

11 A. Yes.

12 Q. So when you --

13 A. When we -- we, as a board of North Snake
14 Groundwater District, have made that determination, and
15 we have expressed that desire to the members of our
16 district and received their --

17 Q. Approval?

18 A. -- "yea" that they would be fine with that.

19 Q. So when you talk about stabilizing, what does
20 that mean to you in terms of your North Snake members in
21 the district?

22 A. Our idea is that we will not see further
23 declines going down. Not that we'll recover it to a
24 particular level, but they will not continue to decline.

25 Q. Not continue the declines that we've seen in

1 the last couple years?

2 A. No. Decline in the last 20 years.

3 Q. Then looking at this table that Jaxon Higgs
4 put together that you have in front of you, you
5 indicated that the first couple columns were a steady
6 state calculation?

7 A. That was my understanding, that we requested
8 from the Department that they give us -- the allocation
9 of the amount of this order would be for the districts.
10 And my understanding was that the numbers that are there
11 in the first columns, like, for example, North Snake
12 would be 3,262 acre-feet, was done on some -- whether
13 it's a modified steady state analysis or what, but it
14 wasn't done on the straight transient analysis.

15 Q. So is it fair to say that, in the first column
16 where it says 5.1 percent, that's -- North Snake's
17 obligation under a steady state modeling was
18 5.1 percent?

19 A. That's my understanding.

20 Q. So that would be 5.1 percent of the obligation
21 that would be owed to the Surface Water Coalition?

22 A. Yes.

23 Q. Under a steady state analysis, to be fair?

24 A. Yes.

25 Q. And with respect to your -- not "your," but

1 the North Snake groundwater rights within the
2 groundwater district, have most, if not all, of those
3 groundwater rights been in place for -- since 1993, the
4 date of the moratorium; do you know?

5 A. Most, I would say, most have been in place
6 since then.

7 Q. A very high percentage?

8 A. Yes, a high percentage.

9 MR. SIMPSON: That's all the questions I have.
10 Thank you.

11 HEARING OFFICER: Okay. Mr. Budge, redirect.
12

13 REDIRECT EXAMINATION

14 QUESTIONS BY MR. BUDGE:

15 Q. Yeah, just a few follow-up questions, Lynn.

16 Mr. Simpson was asking you some questions
17 about the snowpack this last winter?

18 A. [Witness nods head.]

19 Q. And you understand it was well above average
20 snowpack this winter in the Upper Snake River Basin?

21 A. Well, it was above average. Now, well above
22 average, I'm not sure what that number means, but at
23 times we were up close to 150 percent of average. And
24 in certain parts of it, it was above that.

25 Q. And in years past when we had that much snow

1 in the mountains, there would not have been a
2 curtailment under the Methodology Order; correct?

3 A. Not that I remember.

4 Q. Okay. And do you understand that under the
5 Fourth Methodology Order, there would not have been a
6 curtailment this year?

7 A. I don't know that for sure.

8 Q. Okay. But you did understand or did assume
9 that with as much snow as we've got, you did not expect
10 a curtailment coming this year?

11 A. I did not expect a curtailment coming this
12 year.

13 Q. Let me ask you a few questions about that
14 table in front of you, which is Exhibit 829, the table
15 that Jaxon Higgs prepared.

16 Mr. Fletcher asked you some questions about
17 how mitigation obligations are apportioned among the
18 groundwater districts under the 2015 settlement
19 agreement.

20 Do you recall that?

21 A. Yes.

22 Q. You understand that the terms of that
23 agreement do not specify how that 240,000-acre-foot
24 obligation is apportioned among the districts?

25 MR. FLETCHER: Director, I'm going to object

1 simply because I didn't ask that question, but I don't
2 mind this line of inquiry. I mean, I don't know how to
3 do that. That was not my question to Mr. Carlquist.

4 MR. BUDGE: I'll accept the withdrawal of
5 objection.

6 MR. FLETCHER: I'm objecting to the fact that
7 I asked about that. I did not.

8 HEARING OFFICER: All right.

9 MR. FLETCHER: It misstates the foundation for
10 the question.

11 HEARING OFFICER: All right. So,
12 Mr. Carlquist, if you remember the question, you may
13 answer. Otherwise, Mr. Budge, please restate the
14 question.

15 THE WITNESS: Well, I think I remember, but go
16 ahead and restate it.

17 Q. (BY MR. BUDGE) Do you recall Mr. Fletcher
18 discussing with you for a moment the 2015 settlement
19 agreement between IGWA and the Surface Water Coalition?

20 A. Broadly, I guess, yeah.

21 Q. And he was asking if your district's planning
22 to comply with that this year?

23 A. Yes.

24 Q. You understand that one of the terms of that
25 agreement is that the groundwater districts

1 collectively -- or the groundwater users collectively
2 will conserve 240,000 acre-feet of water?

3 A. Yes.

4 Q. And you understand that the agreement does not
5 specify how much conservation each individual
6 groundwater district has to achieve?

7 A. I don't think the agreement says that, but the
8 groundwater districts apportion their share of the
9 240,000 acre-feet based on their share of pumping, their
10 historical baseline pumping that they had had the
11 previous five years.

12 Q. And that apportionment was an agreement that
13 the groundwater districts struck among themselves after
14 the 2015 settlement agreement was signed?

15 A. Yes.

16 Q. And you understand the Director recently
17 changed or interpreted the terms of that agreement in a
18 way that would collectively require the groundwater
19 districts to conserve more water than they had
20 historically?

21 A. More than we have historically, yes. When the
22 allocation -- when we did the allocation among the
23 groundwater districts, we assumed that everyone who
24 pumps water would have some share of that
25 240,000 acre-feet. So the districts that were -- signed

1 the agreement -- the six districts that signed the
2 agreement, allocated 202,000 of the 240,000 acre-feet.

3 Q. 205,000?

4 A. Yeah, it was 202 or 205, yeah.

5 Q. And now that the Director's come out with the
6 new transient state model application, does that change
7 your thinking on how the 240 should be allocated?

8 A. Well, that's possible. We'll have to
9 negotiate like we did before with the groundwater
10 districts, but our district has decided that we are
11 going to maintain our reduction proportion that we've
12 had in the past, which is based on the 205, not the 240.
13 That's what -- that's the allocation that we send out.
14 Pumping allocation to the members of our district is
15 based on our share of the 205,000 acre-feet.

16 Q. Yeah. Is it fair to say that the information
17 in that table that shows the transient state impacts,
18 that the districts have discussed how to reallocate the
19 240 and not been able to reach an agreement?

20 A. No. No agreement has been reached.

21 MR. BUDGE: The last thing I would do,
22 Director, and this is just really for clarity of the
23 record, is, I've been referring to Exhibit 829, which is
24 that table from an excerpt from Exhibit 837. I would
25 move that we admit that as a separate of exhibit just

1 for ease of reference in the record.

2 HEARING OFFICER: Any objection?

3 MR. FLETCHER: We have no objection. It was
4 already admitted as part of Sophia's expert report.

5 HEARING OFFICER: The document, then, that has
6 been marked as Exhibit 829 is received into evidence.

7 (Exhibit 829 received.)

8 MR. BUDGE: Thank you, Lynn.

9 HEARING OFFICER: Any further
10 cross-examination?

11 MR. FLETCHER: I don't have anything further.

12 MR. SIMPSON: No.

13 HEARING OFFICER: Thank you, Mr. Carlquist.

14 Now, my list of witnesses, I don't know where
15 to go. Please direct me.

16 MR. JOHNS: I think we're going to have Bryce
17 Contor go up next, if that's permissible.

18 HEARING OFFICER: All right. Mr. Contor, if
19 you'll come forward, please.

20 MR. JOHNS: Do you care if I --

21 HEARING OFFICER: You can sit or stand if you
22 want.

23 Will you raise your right hand.

24 ///

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

BRYCE CONTOR,
called by Bonneville-Jefferson Ground Water District,
having been first duly sworn to tell the truth relating
to said cause, testified as follows:

HEARING OFFICER: Thank you. Please be
seated.

Mr. Johns?

DIRECT EXAMINATION

QUESTIONS BY MR. JOHNS:

Q. Good afternoon, Mr. Contor. For the record,
my name is Skyler Johns, and I represent
Bonneville-Jefferson Ground Water District in this
matter.

Can you please state your name and spell it
for the record.

A. Bryce Contor, B-r-y-c-e, C-o-n-t-o-r.

Q. And just to check, are you okay if I call you
Bryce?

A. Yes, sir.

Q. Perfect. The parties have stipulated to your
qualifications as an expert; however, would you just
briefly describe your educational background for us?

A. I've got an associate degree in farm crops

1 management. I've got a bachelor's degree in
2 agricultural economics, a master's degree in hydrology
3 from the University of Idaho.

4 Q. Can you, please, also describe your work
5 history on water issues.

6 A. Yeah. So I farmed, I irrigated with
7 groundwater and surface water, I served on the canal
8 board. As a member of the canal board, I prepared
9 the -- our little tiny canal company's adjudication
10 claims.

11 I later went to work for Idaho Department of
12 Water Resources, first measuring discharge wells in the
13 Magic Valley and then in the Mud Lake area and also west
14 of Idaho Falls.

15 After that I worked for Idaho Department of
16 Water Resources making adjudication recommendations in
17 the Snake River Basin Adjudication.

18 I went to work as a hydrologist for the
19 University of Idaho doing the water budgets for the
20 ESPAM models from 2001 through about 2010. During that
21 time, I did subcontract work under Water District 1
22 doing field examinations for Snake River Basin
23 Adjudication claims.

24 And then in 2010, I transitioned to the
25 private sector. I've done water rights work, landfill

1 work, flow measurement work, all related to water
2 resources.

3 Q. Okay. And are you still in the private
4 sector?

5 A. Yes.

6 Q. Who's your employer?

7 A. Rocky Mountain Environmental Associates is the
8 company. In this matter, Rocky Mountain is employed by
9 the Bonneville-Jefferson Ground Water District.

10 Q. And what's your current occupation or title?

11 A. My occupation is a hydrologist. My title is
12 principal hydrologist.

13 Q. Have you ever previously been identified as a
14 witness in an IDWR proceeding?

15 A. Yes.

16 Q. About how many proceedings have you been a
17 part of?

18 A. Probably eight or ten, including both water
19 right matters and some, you know, private district court
20 things that related to water but not before IDWR, and I
21 haven't parsed it out.

22 Q. For the record, were you invited to
23 participate in what's been referred to as the 2022
24 technical working group for this matter?

25 A. I was not.

1 Q. Okay. So you're coming in fresh and having to
2 review some of this information?

3 A. Yes.

4 Q. You had already stated you're here
5 representing Bonneville-Jefferson Ground Water District;
6 correct?

7 A. Yes.

8 Q. Were you asked to create an expert report for
9 this proceeding on their behalf?

10 A. Yes.

11 Q. Okay. And has that report been provided?

12 A. Yes.

13 Q. Will you please turn to Exhibit 500.

14 Yeah, there should be three copies.

15 COURT REPORTER: And if you can guys can slow
16 down a little bit, please.

17 MR. JOHNS: I thought I was going slow. I'll
18 try.

19 THE WITNESS: We're trying to go slow in an
20 expedited manner.

21 MR. JOHNS: Being concise in an expedited
22 matter.

23 Q. (BY MR. JOHNS) Could you please identify the
24 document that's in front of you.

25 A. It's my expert report. It has a long title,

1 but it's my report.

2 Q. Okay. And can you please identify what you
3 were asked to do in this report.

4 A. So I was asked to do just four things, kind of
5 a subset of all of the issues:

6 I was asked to look at the technical arguments
7 made by the Department to justify the change to a
8 transient modeling.

9 I was asked to review the purposes of the
10 ESPAM models and technical opinions regarding the use of
11 those models.

12 I was asked to talk about the possible
13 application of source water fractions to address the
14 supplemental water question.

15 And then I was asked to talk about logical
16 consistency in the use of transient modeling and in the
17 use of steady state modeling.

18 Q. Okay. So did you review the Fifth Methodology
19 Order -- and I believe that is marked as Exhibit 300 --
20 and then the 2023 As-Applied Order, which I believe
21 that's -- did you review those documents?

22 A. So I did a cursory review of the entire
23 document, and then I focused on the parts relating just
24 to these issues.

25 Q. What information did you look at in

1 preparation for this report?

2 A. I looked at old documents that I had prepared
3 when I worked at Idaho Water Resources Research
4 Institute. I looked at additional information prepared
5 by others from the IDWR website related to the ESPAM
6 modeling. I looked at some prior orders in this matter.
7 We can look back here. Those are the primary ones that
8 I relied on. I looked at a document that I had prepared
9 in a Rangen proceeding.

10 Q. And is the information pertaining to those
11 documents provided in your report or cited in your
12 report?

13 A. It is.

14 Q. Will you please generally describe the
15 conclusions in your report.

16 A. So I'd like to just quickly go to -- I think
17 it's page 30.

18 Q. Okay.

19 A. So the first two opinions -- and I wish I had
20 numbered these -- were regarding the factual reasons
21 given in the Fifth Order. And my conclusion was that
22 those reasons are not factually correct; and that,
23 therefore, I don't know what the actual reasoning was,
24 and I cannot evaluate the actual reasoning.

25 The next point, the third conclusion is that

1 the use of ESPAM modeling is technically defensible when
2 the use of the model is tempered both by the knowledge
3 of the ratio of the relief provided and the burden to
4 generate that relief and the precision of the model for
5 the question being answered.

6 The next two are the response to the question
7 about supplemental groundwater, and it's, essentially,
8 the same thing. The argument's presented in the order I
9 found not to be factually correct, and so I can't speak
10 to the actual reasoning for that decision.

11 And then the last three talk about the --
12 well, let's see -- no, the next one talks about the
13 effect. I talk about the multiplier effect of the
14 consequence of ignoring the supplemental use.

15 The last two, then, talk about the consistency
16 between the time frame of the modeling, the question
17 being asked, and essentially there's two conclusions.
18 One is that if you calculate the obligation one way and
19 partition it another, then you could -- it can result in
20 a party being responsible for more mitigation than their
21 curtailment could have possibly generated.

22 And then the last one I think is probably the
23 most important, is that technical methods exist to make
24 a technically coherent alignment between the problem
25 that's trying to be solved and the tools that are

1 available to address the problem.

2 Q. And the reasons justifying those conclusions
3 are provided in your report; correct?

4 A. They are. And -- yes.

5 Q. And you and I had spoke earlier. Have you
6 identified any mistakes or corrections that we need to
7 make on the record that you located in your report after
8 it was submitted?

9 A. Yeah. I -- the most important one is on
10 page 29, I think. I refer to a figure -- the second
11 full paragraph on page 29 -- "visual inspection of
12 figure R16," I did not get that figure into the report,
13 but it is presented as Exhibit 511. And I'm sure there
14 are some typos that I've not yet captured.

15 Q. Okay. Just in general, were you able to
16 perform all the work that you wanted to perform in this
17 report?

18 A. No.

19 Q. Can you identify just some general technical
20 subject matters that you would have liked to have gotten
21 into?

22 A. Well, certainly, I would have liked to have
23 reviewed the things that Mr. Sullivan and Ms. Sigstedt
24 reviewed that I didn't even address. But within the
25 topics that were assigned to me, I would like to have

1 further explored the implications of transient modeling
2 of ESPAM2.2 in regard to this question of assigning
3 responsibility and in regard to the question of the
4 logical consistency between transient and steady state.

5 I tried to do some exploration for the second
6 purpose, which was to generate a technical opinion
7 regarding the use of the model. I would have liked to
8 have further explored work that's been done by others
9 and some original work regarding anticipated precision
10 and uncertainty of the ESPAM2.2 model.

11 Q. And was that work not performed due to time
12 constraints?

13 A. That's correct.

14 Q. Would it have improved your analysis in
15 reviewing the Fifth Amended Methodology Order and
16 preparing for this hearing?

17 A. It certainly would have made me -- made my
18 analysis more solid, more coherent, given me more
19 opportunity to be sure that I had not missed something
20 in the analysis. It may also have enabled me to
21 generate additional insights that might have been
22 useful.

23 Q. I want to talk briefly about your involvement
24 with the ESPAM modeling and your experience at IWRRI.

25 Can you please describe what work you

1 performed related to ESPAM while you worked at IWRRI?

2 A. So while I was at IWRRI, my assignment and the
3 reason I was hired was to be responsible for the water
4 budget input to the model, and so that is all of the --
5 we call them "goes ins" and "goes outs," all the sources
6 of water and all of the sources of withdrawals from the
7 aquifer with the exception of the interaction of the
8 Snake River.

9 While I was there, I also generated scenarios
10 using the model after it was -- after the model was
11 developed, first, to the ESPAM1.1 and 1.1 and then to
12 some extent with the ESPAM2.0 model.

13 The other thing that I did was I ended up
14 having a substantial role in providing transparency
15 through presentations to the Eastern Snake Hydrologic
16 Modeling Committee and in writing design documents.

17 Q. And did you make presentations to the
18 Department regarding the ESPAM model?

19 A. I did to the extent that the Department
20 personnel were involved in the ESHMC modeling committee.

21 Q. And was a report generated for that or some
22 sort of a document generated?

23 A. So there were many documents. I think the one
24 that I referred to in this report was a specific report.
25 IWRRI was asked, and I was tasked to be the lead on

1 assessing what would be the implications of using the
2 ESPAM model, and this was initially the ESPAM1.0 model,
3 in assessing the effects of curtailment of groundwater
4 rights.

5 Q. Did your analysis include an analysis of
6 transient modeling?

7 A. It did.

8 Q. And to your knowledge, has that information
9 changed over time, at least the findings with regard to
10 transient modeling?

11 A. So qualitatively, nothing has changed. And a
12 good part of my report wades through individual findings
13 that were in that 2006 document. But -- you know, but
14 the nutshell is, there's nothing known now about
15 transient modeling that was not known then. Different
16 versions of the model produced different results, and so
17 those have changed, but qualitatively, nothing has
18 changed.

19 Q. And you've been present -- just for the
20 record -- you've been present this -- since Tuesday when
21 this hearing began and listened to the testimony that's
22 been presented by the witnesses?

23 A. Yes. You know, I've stepped out a time or
24 two, but I've been here the whole time.

25 Q. And so I think that this -- I want -- again, I

1 want to be concise. I think that some of the arguments
2 on this have already been presented, but do you agree
3 with the statement that the technical justifications for
4 moving from -- or do you agree with the Department's
5 technical justifications for IDWR moving from steady
6 state to transient as they're presented in the Fifth
7 Methodology Order?

8 A. I do not.

9 Q. And do you agree that with -- I believe it was
10 with Ms. Sukow -- I don't want to mischaracterize her
11 testimony, but I think she said that the decision was
12 not technical to move from the steady state or to
13 transient; is that correct? Or is that your
14 recollection of her testimony?

15 A. That sounds about like what she said. So if
16 there were technical reasons, number one, they have not
17 been revealed, to my knowledge; and number two, I can't
18 think of any technical reasons.

19 Q. Well, I won't belabor that point, but have the
20 reasons -- or have your reasons for your conclusion with
21 regard to the technical justifications for transient
22 been provided in your report?

23 A. Yes.

24 Q. Okay. Is there anything else that you'd like
25 to add on the technical justifications for transient?

1 A. I think just qualitatively that either steady
2 state or transient could be, technically, justifiable if
3 the entire package were considered, if all the
4 implications of either type of modeling were considered.

5 Q. And I think we're going to talk about a couple
6 of those. We'll dig into them. So we'll move on to --
7 let's grab -- I think it's Exhibit -- the Fifth
8 Methodology Order, is that Exhibit --

9 MR. WOOD: 300.

10 MR. JOHNS: 300?

11 MR. WOOD: Yeah.

12 MR. JOHNS: If we could grab a copy of that.

13 THE WITNESS: Here we go.

14 MR. WOOD: Did you find it?

15 THE WITNESS: I did. At least it has the
16 right number on the cover. Okay, yes.

17 Q. (BY MR. JOHNS) Could you turn to page 30 of
18 the Fifth Methodology Order.

19 A. Page 30?

20 Q. Yeah. And could you read Finding of Fact 83,
21 please.

22 A. "Merriam-Webster's Dictionary defines
23 steady-state as, 'a state or condition of a system or
24 process that does not change in time.'" And then
25 there's a citation.

1 "A steady-state ESPAM simulation can only
2 model increases in aquifer discharge to the Snake River
3 resulting from continuous curtailments of an identical
4 magnitude and location until the impacts of curtailment
5 are fully realized. For example, a steady-state
6 analysis of the curtailment of 1,000 acres, assumes that
7 irrigation of the same 1,000 acres is curtailed every
8 year at the same rate of consumptive use until the
9 impacts of that curtailment reach a steady state or no
10 longer change from year to year."

11 Q. What's your professional reaction to Finding
12 of Fact 83?

13 A. It's twofold. First, there's some
14 embarrassment that I may have precipitated this line of
15 thinking in my 2006 report. And then second, it's not
16 technically correct.

17 Q. How so?

18 A. So steady state can be used to describe a
19 cubic-feet-per-second effect, or it can be used to
20 describe an acre-foot effect. And in the 2006 report, I
21 did use steady state on a cfs basis, and there are ways
22 of construing that that would make this statement true
23 in that context. But in the context of a curtailment,
24 it's an acre-foot basis.

25 And I think, if you were to -- you know, so

1 1,000 acres, so that's 2,000 acre-feet per year. If you
2 curtail 2,000 acre-feet per year for an infinite period
3 of time, the accrual to the Snake River would be
4 infinite, and that's not what a steady state model would
5 show you. A steady state model would show you that if
6 you curtailed 2,000 acre-feet, it would show you that
7 2,000 acre-feet were expressed at various points on the
8 river, and it would estimate where those points were.

9 Q. What would you include in the definition to
10 make it more accurate?

11 A. So may I refer back to Exhibit 500?

12 Q. Yes.

13 A. Towards the end, I edited it. And if you find
14 the page before I do --

15 Q. I believe page 12, page 12, Exhibit 500.

16 A. Are you ready for me?

17 Q. Let the --

18 A. Yeah.

19 Q. -- folks get there.

20 Go ahead.

21 A. So I won't read all of this struck material;
22 I'll only read what I retained and what I added.

23 "Merriam-Webster's Dictionary defines
24 steady-state as 'a state or condition of a system or
25 process that does not change in time.'" And then some

1 citations.

2 "A steady-state ESPAM simulation based on
3 input values of acre-feet of curtailment can only
4 indicate total acre-feet of accrual to modeled reaches
5 of the Snake River and tributary springs resulting after
6 the effects of curtailment have been fully realized.

7 "For example, a steady-state analysis of the
8 curtailment of 1,000 acre-feet would indicate where the
9 1,000 acre-feet of accrual eventually would be expressed
10 but would not describe the timing of arrival of
11 accruals."

12 Q. So in your opinion, the definition of steady
13 state, as it appears in the Fifth Methodology, is
14 technically incorrect?

15 A. As applied to acre-feet, it is technically
16 incorrect.

17 Q. Can you please turn to page 11 of your report.
18 And I'm looking at Figure R7.

19 Do you see that?

20 A. Yes.

21 Q. Can you explain what Figure R7 shows?

22 A. Figure R7 is from that 2006 product that we
23 produced for IDWR, and each line represents the
24 transient effects of an ongoing curtailment activity
25 corresponding to the priority date there in the legend.

1 And the little symbols that are there on the very right
2 represent the equivalent steady state result from that
3 same curtailment date. And what it shows is that over
4 time, the transient modeling does approach the steady
5 state result.

6 And this figure doesn't show it, but the fact
7 is that if you could run transient out to eternity, then
8 it would exactly equal the steady state result.

9 Q. So could you explain how transient and steady
10 state are being used in the Methodology Order?

11 A. So the order itself, as I read it, specifies
12 that transient will be used to determine a priority
13 cutoff date. I didn't find it. And again, I was
14 time-constrained. I didn't find in the Methodology
15 Order a specification of how steady state would be used,
16 but in the As-Applied, I found that it was used to
17 assign responsibility specifically between the parties
18 that have mitigation plans and those who do not.

19 Q. What about steady state?

20 A. So I'm sorry, if I misspoke, in the
21 As-Applied, that's how steady state was used.

22 Q. Okay. And transient is for calculating the
23 priority date?

24 A. So in the Fifth Order and then the As-Applied,
25 transient was used to calculate the priority date, and

1 then steady state was used to assign responsibility, as
2 I read those.

3 Q. Responsibility for mitigation?

4 A. I believe that was -- yes, I believe it was
5 responsibility for mitigation.

6 Q. In your opinion, are the different uses of
7 steady state and transient in the Fifth Methodology
8 Order technically defensible?

9 A. They aren't, both because in neither case is
10 the entire picture considered, but also because they
11 fundamentally speak to different goals or processes. So
12 the transient, you know, just by the nature of it, would
13 be an appropriate tool if you were considering
14 short-term effects. Transient -- or steady state, by
15 the nature of it, would be appropriate if you're trying
16 to consider long-term cumulative effects.

17 It appears that the Fifth Methodology Order is
18 focused on short-term effects, and, yet, the As Applied
19 still used a tool more appropriate for long-term
20 effects. And, you know, either the goal is this or it's
21 this, and they're not the same thing.

22 Q. In your review of the Fifth Methodology Order,
23 were you able to identify any of the stated goals for
24 steady state or transient?

25 A. So there was discussion of a goal of transient

1 to try to achieve in-season. I think there was --
2 within the season of use there was a five-month period
3 that was the stated goal for transient. I did not find
4 reference to the prior goal for use of steady state.

5 Q. So is it your opinion that there's kind of
6 conflicting goals that are going on by the way steady
7 state is being used and transient is being used in the
8 Fifth Methodology Order?

9 A. So in the order itself, only transient is
10 specified. The As-Applied creates the tension because
11 the As-Applied uses both.

12 Q. So is it fair to say, to be technically
13 correct, you would need to use transient to do both or
14 steady state to do both calculations?

15 A. That's my opinion, yes.

16 Q. And that's not how it's being done this year?

17 A. That's correct.

18 Q. What's your understanding of the original
19 purpose of the ESPAM tool?

20 A. So it was originally designed to aid IDWR both
21 in planning and in administrative questions. Although,
22 I think the word used in most of the reports was
23 "management." I think, from having been there, the
24 intent really was administration, even though the word
25 used was "management."

1 Q. Has that purpose changed over time?

2 A. Not to my understanding.

3 I think the tool has been -- when I was
4 debating whether to go work on the tool, an attorney
5 said, "Don't worry. As soon as an appropriate misuse is
6 identified, it will be misused."

7 But I think that the primary purposes are
8 still the same, to inform planning and also to inform
9 administration.

10 Q. Okay. In your report you refer to some -- I
11 believe you referred to them as "precautions," where you
12 identified precautions or factors that need to be
13 considered when using the ESPAM when calculating surface
14 water shortfalls.

15 Could you summarize what some of those
16 precautions or factors may be and why?

17 A. Yeah. So the question, when you ask is this
18 the best tool or is this an appropriate tool, you have
19 to consider the suitability of the tool for its purpose.
20 And, you know, if all I have in my toolbox is a crescent
21 wrench, that may be the best tool I have, but it's still
22 not useful for all purposes. For instance, it's not
23 good for turning a Phillips-head screw.

24 So there are two different ways that I
25 approach this question of the appropriateness of using

1 the model. And one is twice during my tenure within the
2 ESHMC, the Eastern Snake Hydrologic Modeling Committee,
3 the committee has been asked to provide a statement on
4 appropriate uses of the model. Neither time were we
5 able to come to consensus.

6 The first time we assembled what we called a
7 white paper, which was really an anthology of statements
8 from various members. The second time various members
9 prepared statements, but the anthology wasn't even
10 assembled. And in that process, there were divergent
11 views, but they ranged from use of the ESPAM model for
12 administration is technically indefensible to it can be
13 used and described some narrow circumstances.

14 The Eastern Idaho Water Rights Coalition gave
15 a more thoughtful -- I don't know if it was more
16 thoughtful, but, certainly, a more lengthy response that
17 talked about matching the precision of the model to the
18 precision of the work -- the results needed and pointed
19 out that the precision of the model depends upon the
20 discretization of the question that's being asked. So
21 that's one set of input to that question.

22 The other is I just looked at -- every version
23 of the model has been, in its day, the best available
24 science. And I looked at the important result of the
25 model for this proceeding, which is the short-term

1 prediction of accruals to the near Blackfoot to Neeley
2 -- or maybe it was the near Blackfoot to Minidoka
3 reach -- combined reach.

4 And what I found is the two subsequent best
5 available sciences in that short time period differed by
6 a factor of more than five. That was one.

7 And then the other is that since ESPAM2.1, the
8 reports have included an R-squared statistic on the
9 ability of the model to meet short-term targets -- the
10 model and its input data to meet short-term targets for
11 each modeled reach. And what I found is that the
12 ESPAM2.2, for the near Blackfoot to Neeley, the
13 R-squared is .42, which means the model is capable of
14 explaining about 42 percent of the variability observed.
15 From Neeley to Minidoka, the R-squared is less than 0.1,
16 which means that it's less -- it explains less than
17 1 percent of the variability.

18 So those -- and if you're going to use the
19 model to predict something that's as important as the
20 water supply for the Surface Water Coalition, to me
21 those are frightening degrees of difference from one
22 best available science to the next, and then within the
23 current best available science, a disappointing ability
24 to perform to the very thing that it's being asked to
25 predict.

1 Q. And is it fair to say that the problem that
2 it's being asked to predict in the context of this water
3 delivery call is short-term problems, in-season demand
4 problems?

5 A. That's my understanding.

6 Q. Does the ESPAM have short-term or is it more
7 of a mid- to long-term response time?

8 A. So the aquifer itself, unless you're talking
9 about a few locations very near the springs or river, if
10 you're talking about the aquifer as a whole, the
11 groundwater irrigated acres as a whole, the response is
12 medium to long to perhaps very long-term.

13 Q. To your knowledge, does the Fifth Methodology
14 Order specify minimum precision and accuracy criteria
15 for the use of the ESPAM?

16 A. I couldn't find it.

17 Q. Is there a metric available that you could
18 measure ESPAM precision and accuracy that you're aware
19 of?

20 A. Well, so for this particular prediction, which
21 is the one important in this question, the R-squared
22 would be the useful statistic. There are additional
23 modeling statistics that could be reviewed, but that
24 would be a very useful and convenient one.

25 Q. Okay. And I believe Matt Anders and

1 Greg Sullivan, and I believe perhaps Sophia did as well,
2 discussed the R-squared values.

3 Could you just briefly describe your
4 understanding of the R-squared values and how that's
5 important in evaluating this type of model?

6 A. Yeah. So, you know, fundamentally the
7 R-squared shows how much of the observed variability can
8 be explained by the model and the data, the equation and
9 the data, the process and the data that are being used
10 to estimate whatever the observed thing is. So it's --
11 R-squared of 42 means 42 percent of the variability is
12 explainable.

13 Q. What level of precision and accuracy does the
14 ESPAM2.2 have when using it to determine monthly
15 estimations of the effects of the near Blackfoot to
16 Minidoka reach? And you have already said this.

17 A. Yeah, so that's basically that 42 percent. It
18 can explain 42 percent of that short-term variability.

19 Q. Do you believe there's a technical basis to
20 set that minimum tolerance level and provide some
21 criteria for that?

22 A. There are. And I have not explored them
23 exhaustively, but, you know, for different types of data
24 there are different typical thresholds. I would think a
25 .5 would be useful in this, which is lower than the

1 R-squared for the Twin Falls regression that everyone
2 seems to be concerned about. But I still think in the
3 modeling context that could be a useful criteria.

4 Q. Do you believe it's a policy question of
5 whether to set that, or is there technical -- is there a
6 technical basis that would inform that policy decision?

7 A. So it is a policy decision. And, you know,
8 ideally, you would make the decision based upon the
9 gravity of the prediction being made and then you would
10 look to see if the candidate tools are capable of
11 meeting that. I think it would be tempting to do it the
12 other way, "Well, we want to use this tool. Let's set
13 our criterion so this tool passes." I don't like that
14 kind of science.

15 Q. What kind of technical work could inform the
16 policy decision establishing minimum criteria?

17 A. So a broader exploration of typical model
18 precision -- you know, again, the technical work, the
19 gravity of this situation -- of this prediction in terms
20 of whether or not the calculated relief will take care
21 of what the Surface Water Coalition needs, the gravity
22 of the much larger effort that has to be made by
23 groundwater users to provide that relief, those together
24 could inform on the one hand what's attainable, on the
25 other hand what would be necessary to justify and to

1 support the gravity of the decision being made.

2 Q. I think you touched on or you at least
3 addressed the best available science standard. My
4 question, I guess in follow-up to that, is the best
5 available science standard as you understand it within
6 your range of scientific tolerance, so to speak?

7 A. Help me understand. I'm not tracking what
8 you're trying to ask.

9 Q. So is best available science in your work, if
10 you were to make a recommendation as a scientist, is
11 that good enough for you? I think you touched on this.

12 A. Oh, okay. No, it's not. I think that two
13 things are required: It has to be the best available,
14 and it has to be good enough to address the question at
15 hand, both in its ability to provide an answer and in
16 the gravity of the -- you know, if someone asks me what
17 do you think about "X," I'm really comfortable, and it's
18 just casual conversation shooting from the hip. But if
19 someone's livelihood depends on it, if I get this answer
20 wrong, they won't have enough water to irrigate with.
21 I'm not comfortable shooting from the hip. And that's
22 the kind of process, thought process, I would go
23 through.

24 The other thing that's important is that paper
25 from Roger Warner, Eastern Idaho Water Rights Coalition,

1 that I referred to, points out that the precision of the
2 model depends upon the kinds of questions that are being
3 asked. And if you've got a model that cannot answer a
4 very specific question, if you can reformulate the
5 question more broadly, and if that means reformulating
6 the policy or the action that that is informing more
7 broadly, then you can greatly improve your confidence
8 that your results are meaningful and will provide the
9 needed relief.

10 Q. And I want to talk about that with you, Bryce,
11 because, again, we've identified there's some issues
12 with, you know, the criterion and that.

13 But can you provide any suggestions on how to
14 improve, I guess it would be, the R-squared value of the
15 ESPAM, things that the Department should look at?

16 A. Yeah. So Sophia talked about many of her
17 recommendations that have been made in the Eastern Snake
18 Hydrologic Modeling Committee. And, you know, the
19 bottom line is that to get the R-squared value better,
20 the model has to get better. And I agree completely
21 with Ms. Sigstedt that we've put as much lipstick on
22 this single-layer pig as this single-layer pig can wear,
23 and we need to make an advance in our structural
24 representation in our conceptual model before we're
25 going to get to meaningful improvement.

1 The other thing that Ms. Sigstedt said that I
2 think is very important is that you can overfit a model,
3 and some of that 42 percent of variability that the
4 statistic says the model is able to predict, as
5 Ms. Sigstedt said, it may be getting the right answer
6 for the wrong reason, and it can only get that answer
7 when it's spoon-fed the data that were used to build it.
8 And if you want independent data to actually make a
9 prediction, that 42 percent number may be an
10 overestimate.

11 But either way, there's ongoing technical work
12 that can be done, it is being done, IDWR is striving
13 hard, and I think there are things that can be done to
14 improve it.

15 Q. Just briefly, can you explain in your report,
16 you refer to ratios of relief to cost. You touched on
17 this, but can you just kind of summarize that again what
18 you mean by ratios of relief to cost?

19 A. Yeah. And so I'm not talking about an
20 economic valuation. We've heard that that's not
21 appropriate. But it's clear from a lay reading of not
22 only the conjunctive management rules but the order
23 itself that there is a need to maximize the use of the
24 state's water resources and that there is a need to
25 secure the maximum benefit to the state from its

1 resources.

2 And so as a ratio of beneficial use -- for
3 instance, if you had 1 acre that was mischaracterized as
4 being irrigated by surface water, and so you have
5 calculated a shortfall to supply that acre, and in
6 reality that acre didn't need any surface water because
7 it was applied by groundwater, that acre requires --
8 we've heard 5.8. For simple math, I'll round it to
9 5 acre-feet of water. We're going to go out on the
10 plain somewhere and curtail groundwater to supply that
11 5 acre-feet.

12 But even if we could be 100 percent, if we
13 could have a pipe from the groundwater user to that acre
14 because groundwater users, as Mr. Carlquist testified,
15 divert so much less, now we're going to have to have 2
16 or 3 acres of groundwater beneficial use to be curtailed
17 to supply this 1 acre of beneficial use that's not
18 needed.

19 Now we add in the fact that where you are on
20 the plain, only a fraction of your -- of the groundwater
21 pumping that's curtailed or foregone will actually
22 accrue to that reach. On average, across the plain, now
23 you've doubled that 3 acres to 6. There's some place s
24 where you go -- it's an incredibly large number because
25 there's such small effect.

1 Now, if you add in the fact that now we insist
2 that this entire benefit accrue in this narrow period of
3 time, to get that one -- you know, to get the effect of
4 those 6 acres, we have to curtail ten times as many. So
5 now we're -- we've -- because we've been unable to
6 identify this 1 acre that actually has no need, we've
7 erroneously removed 60 acres of beneficial use.

8 That's the multiplier effect that I'm talking
9 about, and it applies to any imprecision that causes the
10 calculated shortfall to be larger than the Surface Water
11 Coalition's actual need.

12 Q. Okay. And did you have time to look into some
13 specific things or adjustments that could be made in the
14 model that could account for or address that issue of
15 ratios of relief to cost?

16 A. So I did not. Except that conceptually the
17 model can refine what that ratio is, but the ratio
18 exists because of the physical characteristics of the
19 aquifer. It's really independent of modeling. Modeling
20 is only a tool used to estimate the magnitude of that
21 effect.

22 Q. So it's something you weren't able to get
23 into, but if I under your testimony, the ESPAM is
24 capable of performing such analysis -- or you're capable
25 of --

1 A. So the aquifer actually causes the effect.
2 The model, within its limits of precision, can estimate
3 those effects.

4 Is that -- did I answer the right question?

5 Q. I think that's the answer to the question I
6 meant to ask you.

7 A. Okay.

8 Q. I want to talk to you about supplemental water
9 use, and I believe Greg has discussed this, Sophia. I
10 mean, it's been, you know, discussed quite a bit, so I'm
11 just going to kind of move around on a couple of
12 questions throughout here.

13 But could you turn to page 10 of the Fifth
14 Methodology Order. And in the interest of being
15 concise, could you just -- I'll just note that we're
16 looking at page 10, Finding of Fact No. 23.

17 A. Yes.

18 Q. Could you just skim that?

19 A. Yeah, so -- okay.

20 So what I read is that there are areas of
21 supplemental groundwater supply. It is allowable to
22 consider that but that the information available to the
23 Department is not sufficient to make that determination.

24 That's what I read there.

25 Q. Okay. So is it fair to say that the Fifth

1 Methodology Order didn't consider supplemental
2 irrigation?

3 A. Only to the extent to acknowledge that it
4 could be, but did not actually do that.

5 Q. What implications are there by not considering
6 supplemental irrigation?

7 A. So it's exactly this multiplier effect, that
8 if a piece of ground actually is not irrigated by
9 surface water, then there's no need to provide surface
10 water to support that acre. And if we erroneously try
11 to support that acre, then depending where on the plain
12 that reduction or curtailment has to take place, we're,
13 you know, perhaps, as much as 60 times the reduction of
14 beneficial use for something that actually is not
15 needed.

16 Q. I believe it was Greg Sullivan who stated that
17 he believes there's a framework where you could consider
18 supplemental groundwater use.

19 Do you agree with that statement?

20 A. Yes, very much.

21 Q. Have you identified in your report any
22 documents or anything that speaks to -- or provides
23 frameworks for supplemental groundwater use?

24 A. Yes. There's -- I think I made four
25 references. Three of them are to modeling reports that

1 provide thumbnail sketches. One of them, I think the
2 most important one, is to a design document that I and
3 Paul Pelot prepared. So this --

4 Q. Just is that the determination of source
5 irrigation water?

6 A. Yes. Yes. So that would be --

7 Q. Exhibit 515, I believe, is what that is.

8 A. Yes. And I don't think I need to refer to it
9 to just tell you in a nutshell.

10 So in a nutshell, I spent hours and hours and
11 hours over several years wrestling and refining this
12 because that was my job at Eastern Idaho -- at IWRRI
13 was -- and this is an important part of the water
14 budget, of the -- I think others have talked about the
15 general methods, the general data that are available. I
16 think the important thing that I can add from that
17 exhibit -- whatever the number you said --

18 Q. 515.

19 A. Okay. -- is that to refine our understanding,
20 for things we could not tell any other way, we developed
21 a statistically valid sampling of 300 points, which is a
22 pretty robust dataset across the plain. And I trained
23 Mr. Pelot, and we funded him, and he went and looked at
24 these points individually. And the point of that is
25 that was not an onerous task. And we did that, you

1 know, over -- that part of it we did just over part of a
2 summer.

3 And so there are robust methods that are
4 available, and there are ways to account for the
5 imprecision of those methods that are protective of the
6 senior right. That's the importance of those four
7 documents.

8 Q. Okay. Could you just describe a technically
9 defensible adjustment relying on those documents that
10 you can make the ESPAM for supplemental groundwater use?

11 A. So it would certainly be technically
12 defensible to use the W-I-M-S [sic], Water Measurement
13 Information System, data and any groundwater pumping
14 that was indicated by the WMIS data to occur within the
15 Surface Water Coalition on acres that they have
16 identified could immediately be subtracted defensibly.

17 And the reason for that is, is that any kind
18 of a failure that could occur with the underlying data
19 in the WMIS -- and I know this from being actively
20 involved in the first three years of the program that
21 the groundwater data go into -- any of those failures
22 will cause the groundwater diversion to be
23 underreported, which would cause an overestimate of
24 calculated shortfall. So that's the first part.

25 The second part is that the methods outlined

1 in those documents that we don't want to plow through
2 will tell how to identify and confirm the places of use
3 to which those apply.

4 Q. Are there any other frameworks or methods that
5 are technically defensible that you can provide at this
6 time?

7 A. For?

8 Q. For supplemental groundwater.

9 A. For supplemental.

10 Those are the only ones that I can think of
11 right this very minute. I don't think there's anything
12 else in my report. If there is, I apologize.

13 Q. If you were given more time, would you have
14 been able to explore that issue more thoroughly?

15 A. Yes.

16 Q. Is that something you wanted to do?

17 A. It is something I very much wanted to do.

18 Q. And due to time constraints, were you barred
19 from being able to perform that further analysis?

20 A. Yes.

21 Q. Do you think that impacted your testimony at
22 this hearing?

23 A. It certainly did.

24 Q. In what way?

25 A. I was unable to answer the last question.

1 Q. Do you anticipate if you would have had time
2 to do the analysis, you could have provided additional
3 frameworks that could be considered for supplemental
4 groundwater use --

5 A. I, certainly, would have been able to explore
6 what other frameworks there are. You know, I don't know
7 whether that exploration would have led to success.

8 Q. I think you covered that.

9 I think you touched on this, but just for
10 clarification, what's the implication of neglecting a
11 single acre of supplemental irrigation within the SWC
12 service area under the Fifth Methodology Order?

13 THE WITNESS: Are you ready?

14 COURT REPORTER: Yes.

15 THE WITNESS: Okay. Approximately, at least
16 within the right number of zeros, 60 acres of needless
17 loss of beneficial use from groundwater.

18 Q. (BY MR. JOHNS) Does the -- well, let me
19 rephrase it this way: Is it difficult to create the
20 adjustment for supplemental irrigation, in your opinion?

21 A. No.

22 Q. And is it your opinion that the Department has
23 sufficient information to create that adjustment and it
24 will be technically defensible?

25 A. Yes.

1 Q. Does the admission of supplemental water, as
2 we've been discussing from the Fifth Methodology Order,
3 make it less technically defensible?

4 A. The omission from -- in my mind, yes, it makes
5 the Fifth Methodology Order, as a whole, less
6 defensible.

7 Q. So its inclusion would make it more --

8 A. Yes. Inclusion would make it more defensible
9 because there's an important factor that's obtainable --
10 that's obtainable and reliable and that has not been
11 considered.

12 Q. Okay. I want to shift gears and talk about,
13 your report identified a couple of consistency issues,
14 and so I just want to shift gears and talk briefly.

15 Again, I think this issue has been discussed
16 somewhat ad nauseam, so I don't want to belabor it, but
17 there was some discussion about accruals?

18 A. Yes.

19 Q. Do you recall those discussions?

20 A. Yes.

21 Q. Do you agree the Fifth Methodology Order does
22 not make adjustments for accruals for target and
23 nontarget reaches?

24 A. Yes, I agree.

25 Q. What's your professional reaction to that

1 admission?

2 A. It's a surprise because it's an inherent and
3 obvious result of the modeling, number one. And number
4 two, though I'm not a policy expert, I understand enough
5 about what's trying to be achieved here that it's
6 surprising that it's not considered in some fashion.

7 Q. Does it distort the calculation?

8 A. It distorts the calculation in every year
9 beyond the first.

10 Q. Okay. You previously stated the Fifth
11 Methodology Order uses steady state to partition the
12 responsibility for mitigation in lieu of curtailment; is
13 that correct?

14 A. I meant to say that the -- as I read it, the
15 Fifth Order is silent on the partition, but the
16 As-Applied indicates that it was used that way, which
17 itself is a problem. We have an order that does not
18 describe all the methods that are being used, and that
19 causes me heartburn, because I can't address them
20 technically if they're not described.

21 Q. So it's your opinion that the way the steady
22 state was used in the As-Applied is not specified in the
23 Fifth Methodology Order?

24 A. I did not find it in the time that I had to
25 look at it.

1 Q. Okay. And I believe Greg Sullivan may have
2 addressed this, but for the record, is this approach --
3 well, I think we covered that already, Bryce.

4 Could you please turn to page 35 and 36 of the
5 Fifth Methodology Order.

6 A. I am there.

7 Q. And could you please skim Conclusion of Law
8 No. 21. Once you've done that, do you have a
9 professional reaction to that conclusion?

10 A. So this is a conclusion regarding a mitigation
11 plan. My response -- my professional response to this
12 is that it seems to articulate the ability, and not only
13 the ability but perhaps a requirement, to use the
14 modeling tools in a coherent -- in a fashion coherent
15 with both the ability of the tools, the modeling tools,
16 and the ability of the administrative instruments that
17 are used to time frames that match the physical
18 capabilities. And I think it's technically possible to
19 do that.

20 Q. In your opinion, was that done?

21 A. In my opinion, it was not done.

22 Q. Can you please discuss any factors that may
23 affect the precision of estimating the expected relief
24 and the timing of which it will be realized.

25 A. Yeah. So, primarily, it is the ability of the

1 model itself to accurately estimate. The finer the time
2 scale or the finer the temporal scale, the less
3 precision the model is able to actually achieve. And
4 that's the primary limitation.

5 The other limitation is physical. It doesn't
6 matter how much I want to get water from Kilgore to
7 someplace on the Snake River, in a certain time frame,
8 the physical characteristics of the aquifer make that
9 impossible.

10 Q. You've talked somewhat about some technical
11 work that can be performed, but on this point is there
12 any technical work that could be performed to improve
13 the precision in this regard?

14 A. So the -- addressing the deficiencies that
15 Ms. Sigstedt talked about with the conceptual model,
16 certainly the layering, I have been in the camp that if
17 you don't have data to support something, don't put it
18 in the model. I think that's, in some cases,
19 short-sighted. But the clear response is then the
20 gravity of these matters for the needs of the Surface
21 Water Coalition mean that a prudent investment would be
22 to acquire the data to allow adequate modeling of some
23 of those additional features that are known to exist.

24 Q. Were you able to perform some modeling? Will
25 you turn over to page 25.

1 A. You're in Exhibit 500 now?

2 Q. Exhibit 500, yeah.

3 A. Yes.

4 Q. I'm looking through -- you've got Figures R17,
5 the next page Figure R18, and then a series of figures
6 that go through page 28. It appears you were able to do
7 some modeling?

8 A. So R17 and R18 are reproduced from old work;
9 they have some bearing. R19 through -- yeah, R19
10 through R21 were new modeling that was done under my
11 direction by Mr. Kindred of Rocky Mountain
12 Environmental.

13 Q. And can you please explain what the purpose of
14 these figures is and how they relate to the findings
15 in --

16 (Speaking simultaneously.)

17 COURT REPORTER: Okay. Wait. "And how they
18 relate to"?

19 MR. JOHNS: To the findings in your report.
20 Sorry.

21 THE WITNESS: So these figures compare the two
22 most recent best available science versions.
23 Specifically, they're those models' indication of
24 responses to the near Blackfoot to Minidoka reach. I
25 think in all cases, the solid bar represents the

1 ESPAM2.1 results as embodied in the ETRAN 3.3 modeling
2 tool provided by IDWR. The cross-hatched results
3 indicate the results from ESPAM2.2 embodied in the ETRAN
4 3.4 transfer tool. And they show where they are similar
5 and where they are different.

6 Q. (BY MR. JOHNS) And what conclusions did you
7 draw from running these analyses from generating these
8 charts?

9 A. I conclude that if the two successive best
10 available science models differ by this much, it gives
11 us some viewpoint -- some view into the window of how
12 precise can these models be.

13 Figure R19 is the one that I think is most
14 alarming on a percentage basis. So if we're looking at
15 a five-month period, four months is a third of the year.
16 Five months is pretty close to a third of the year. The
17 first in each graph -- the first bar is the indication
18 of that model's estimate of the response in that
19 first -- so in that period of such concern for us.

20 So here from -- in Figure R19, this Row 75,
21 Column 57, at that location, the new model, you know,
22 just guessing by how tall those bars are, indicates
23 about a third of the relief that the old model did. And
24 if it's important to get relief to the Surface Water
25 Coalition, that degree of imprecision is alarming.

1 Q. Are there any -- is there any technical work
2 or any adjustments you could recommend that you haven't
3 discussed already that would improve?

4 A. Not that hasn't already been discussed.

5 Q. Would you please turn to page 28 of your
6 report?

7 A. Yes.

8 Q. And I'll just summarize. In your report, you
9 state that there's a technical analysis that could be
10 performed to inform a policy decision, answering the
11 question: "Is it fair to the SWC to use the model to
12 estimate timing of accruals in the trimester of
13 curtailment when the two most recent best available
14 science models differ by approximately a factor of six";
15 correct?

16 A. Yes.

17 Q. Okay. What technical work could be used to
18 inform this decision?

19 A. So much of it has been done, but it would be
20 further exploration of these questions of precision of
21 the model. That's the first piece.

22 The second piece is relating back to this
23 finding of fact 21, that it appears to be -- there could
24 be an ability to adjust the instruments, perhaps adjust
25 the time frame of consideration of the order to match

1 the ability of the instruments to provide relief to the
2 calculation or definition of the relief required.

3 Q. Were you able to perform any technical work in
4 this regard to help inform your testimony?

5 A. Only these limited figures that are shown here
6 in my report.

7 Q. Okay. Did time constraints prevent you from
8 performing that work?

9 A. Yes.

10 Q. Okay. If you had the time, would you have
11 been able to present that at this hearing?

12 A. I would have, and it would have been much
13 better, because what I presented is not -- it may be
14 spatially representative, but I don't know that it is,
15 and I would have been able to perform analyses that were
16 spatially representative.

17 Q. Would you mind turning over to page 29 of your
18 report --

19 MR. JOHNS: And we're nearing the end here,
20 Director. I think I have this, and then I just have a
21 couple points on rebuttal. We can chug along, or we can
22 take a break.

23 HEARING OFFICER: We probably should break.
24 We've been here two hours. Let's take a 15-minute
25 break. Back at 3:30.

1 (Break taken.)

2 HEARING OFFICER: We are recording.

3 Further questions, Mr. Johns.

4 MR. JOHNS: Thank you, Mr. Director. If I
5 may, I just have some quick rebuttal I'd like to ask
6 Mr. Contor from prior witnesses.

7 Q. (BY MR. JOHNS) Bryce, were you present in the
8 room during the testimony of Jay Barlogi?

9 A. Yes.

10 Q. Barlogi, I believe it is?

11 A. Yeah, I think so.

12 Q. Do you recall a discussion about variations in
13 irrigated acres?

14 A. Yes.

15 Q. On a 40-acre-tract basis, how much is a
16 5 percent change?

17 A. It's 2 acres.

18 Q. You have experience in assessing irrigation in
19 the ground without entering the field?

20 A. I do, starting with my position at the canal
21 company when I was assigned to prepare the adjudication
22 claims.

23 And then I worked for the seed company, which
24 we haven't talked about. I needed to assess what was
25 going on in each tract around my seed isolations, not

1 for irrigation purposes, but it's the same process to
2 assess whether they were growing the same crop as my
3 seed isolation.

4 Then when I was at IWRRI, I did a lot of
5 windshield surveys to verify irrigated lands data,
6 source data, and methodology.

7 So I -- and then I did a lot of that, as well,
8 when I was making -- doing subcontract field
9 investigation for water right claims in the Snake River
10 Basin Adjudication.

11 Q. In your experience, is it easy to detect a
12 2-acre change in a 40-acre tract without entering the
13 ground or going in the field?

14 A. If you're specifically looking for that and
15 the topography is right, sometimes you can catch that
16 but not on a casual basis. On a casual basis, I think
17 2 acres of change in a 40-acre tract could occur and
18 you'd never notice it.

19 HEARING OFFICER: Hello. We have somebody
20 listening in that's not muted, phone number ends in 38.
21 You're interrupting the hearing. Apparently, they're
22 off.

23 MS. TSCHOHL: I was able to mute them.

24 HEARING OFFICER: Okay. Thank you, Sarah.

25 I don't like that kind of interruption, and if

1 it continues, I may just exclude people. Okay.

2 MR. JOHNS: Thank you, Mr. Director.

3 Q. (BY MR. JOHNS) Bryce, you were also present
4 in the room during Ms. Sukow's testimony; correct?

5 A. Yes.

6 Q. Do you recall some of her discussion she had
7 about steady state, and -- just generally, do you recall
8 her discussing steady state analysis?

9 A. Yes.

10 Q. Is it true that utilizing a steady state will
11 not result in realization of the predictive down
12 shortfall in that irrigation season?

13 A. So I think there's some confusion. The
14 modeling won't change when the relief arrives. And so
15 whatever method you use to calculate a curtailment date,
16 when that curtailment is instituted, most of the relief
17 will arrive after the irrigation season.

18 A steady state calculation, because it's time
19 agnostic, will calculate a different number than would a
20 transient; but in either case, only 9 to 15 percent -- I
21 think is approximately correct -- is what actually would
22 arrive. I don't know if that's the question you were
23 asking.

24 Q. I believe that's the question I was asking.

25 Bryce, you were also present during the

1 testimony of Matt Anders; correct?

2 A. Yes.

3 Q. Do you recall Matt Anders making an assertion
4 that -- I believe it was not every drain or return flow
5 from Twin Falls Canal Company is accounted for?

6 A. I do.

7 Q. Okay. What impact does neglecting these
8 return flows have on the calculated shortfall in the
9 Fifth Methodology?

10 A. So if an adjustment for returns were to be
11 made and you omitted a return, that return that got
12 omitted would cause the calculated shortfall to be too
13 large. And so if the data are -- the dataset is
14 incomplete, the data are imperfect, the shortcomings all
15 work to the benefit of the Surface Water Coalition so
16 they are conservative.

17 Q. Do you have any other comments about
18 Mr. Anders' discussion on missing return flow data?

19 A. Only that they have the same multiplier effect
20 that any other omission would. So if you -- if, because
21 of omitting return flow calculations, the shortfall was
22 an acre-foot too high, out on the plain somewhere, you'd
23 have, you know, approximately 60 acre-feet of beneficial
24 use that would have to be foregone.

25 Q. How does the omission of this information

1 affect the technical defensibility of the Fifth
2 Methodology Order?

3 A. It's the same as the other. There's a
4 relevant bit of technical information that is available
5 that was not considered, and so it undermines the
6 credibility of the document.

7 Q. Okay. In your opinion, is there a way to
8 calculate credit for the return flows in calculating
9 shortfall?

10 A. So I'm very familiar with all the work we did
11 in the modeling process to quantify returns. One of the
12 things I would like to have done would be to understand
13 the full calculation of shortfall. I don't understand
14 it well enough to speak to exactly how that would affect
15 that calculation.

16 Q. During Matt Anders' testimony, do you recall
17 some discussion about irrigated acreage data?

18 A. Yes.

19 Q. Do you have any personal knowledge about
20 irrigated lands data that the Department has?

21 A. Yeah. So every irrigated lands dataset that
22 was created up through when I left IWRRI in 2010 was
23 under my responsibility, and particularly the transition
24 to the methodology that's now used, it was my
25 responsibility to ensure that that method was adequate

1 for the modeling purposes. And so at the time it was
2 being developed, I was intimately involved in
3 understanding how it worked in independent verification
4 of it, and so I feel quite comfortable with those
5 irrigated lands datasets.

6 Q. Do you have any opinions as to their
7 sufficiency for determining the irrigated acreage in the
8 Fifth Methodology?

9 A. Yes. I think that because of the process, I
10 think they're robust datasets, and I wanted to talk a
11 little bit about that process. We've talked about a
12 suite of polygons, the CLU polygons that were used to
13 identify discrete blocks of land that may have a
14 different irrigation characteristic. And those came
15 from the U.S. Department of Agriculture, but they were
16 hand-modified by IDWR to correspond to aerial imagery
17 to, again, improve that ability.

18 And then there was a scoring process that used
19 multiple remote sensing data sources for multiple dates
20 during the year to score which of these three categories
21 that it fell into.

22 And then there was an additional
23 hand-verification process. That's part of the reason
24 this process is so costly. It's probably my fault
25 because I raised the issue. We had a spot out in near

1 where I lived at the time that it just happened that
2 every time the stinking satellite flew, my neighbor had
3 just cut his hay and his field was showing up as
4 nonirrigated when, in fact, it was. And pursuing that
5 led to this additional level of handwork that I think
6 makes it a very robust dataset.

7 Q. Would it be technically defensible, in your
8 opinion, to use that data, the irrigated lands dataset,
9 to determine the irrigated acres in the Fifth
10 Methodology Order?

11 A. Not only defensible, I think it's the best
12 available data that could be used.

13 Q. What more can you say about the ability of
14 IDWR to apply its methodology to the SWC areas?

15 A. I think that the areas where IDWR has said
16 it's unable to perform a certain analysis, I think there
17 are robust methods to do that, that when there's
18 uncertainty either the uncertainty inherently cuts in
19 favor of the Surface Water Coalition or that an
20 adjustment can be made.

21 Q. Okay. I want to shift over. And I think this
22 is -- just have a couple questions left, some for
23 Sophia, and then I think just a few conclusory ones, and
24 then we'll be wrapped up here.

25 You were present for Ms. Sigstedt's testimony

1 earlier; correct?

2 A. I was, yes.

3 Q. Sophia, so I don't mess it up.

4 A. Yes.

5 Q. Do you recall her discussion about the
6 R-squared values?

7 A. Yes.

8 Q. Okay. I just want to ask you a couple of
9 questions in follow-up to some things she said.

10 What are the consequences of the degrading
11 R-squared value that Ms. Sigstedt discussed?

12 A. So the consequence is that the prediction is
13 less reliable, which could cut either way. Either to
14 make the calculated shortfall inadequate to sustain
15 Surface Water Coalition needs or cause the required
16 mitigation or curtailment to be in excess of what was
17 needed.

18 Q. And do you agree with Ms. Sophia's statement
19 that there are consequences in neglecting Portneuf and
20 Blackfoot and Henry's Fork?

21 A. I do, but I think she focused on the potential
22 harm to the Surface Water Coalition. I think an
23 important point is that there will be a year when the
24 snowpack is reversed, that the snowpack above Heise is
25 high, and that forecast is robust, but all the other

1 areas have reduced snowpack. And in that case, omission
2 of those data will result in a calculated shortfall that
3 is too low.

4 Q. Do you agree -- there was a discussion that
5 Sophia had about the river package. Do you agree that
6 the river package allows proper representation of the
7 communication between the river and the aquifer --
8 allows proper representation of the communication
9 between the river and the aquifer, given that it is a
10 layered model?

11 A. So I believe the discussion was relative to
12 her criticism that the model is not yet a multilayer
13 model. And the river package and the parameters that
14 describe the operation of the river package allow the
15 best representation of the communication between the
16 river and the model cell that hosts it at the top of the
17 aquifer. But the river communicates through that cell,
18 both to the bottom of that cell and then to adjacent
19 cells, and the river package cannot overcome the
20 deficiencies of a single-layer model in representing
21 that broader communication.

22 Q. Have you noticed any themes from the different
23 witnesses that have been talking about the Fifth
24 Methodology Order with regard to criterion for minimum
25 conservatism?

1 A. So a recurring theme is that if you have
2 multiple components that are each conservative, that
3 that tends to build and build and build on the
4 conservatism. And so one comment that I have related to
5 that is that there are robust mathematical methods to
6 calculate cumulative effects like that in terms of a
7 statistical distribution. They're well known, and
8 they're not difficult to perform.

9 The second is that, as we talked earlier about
10 criteria, you know, the -- the qualitative criterion is
11 that it should be conservative. Well, eight times the
12 need is conservative, so is 100.00001 percent of the
13 need conservative. If an objective standard of the
14 appropriate level of conservatism were set, then those
15 calculations could be applied to ascertain whether that
16 appropriate level were achieved. Because if the level
17 of conservatism by this hip-shot method is too low, that
18 harms the Surface Water Coalition. If it's too high,
19 that harms the groundwater users. And I don't think
20 anybody wants to do either of those things.

21 Q. So when you say that "hip-shot" approach, I
22 mean, are you saying currently there's no way to measure
23 or determine whether IDWR data in the Fifth Methodology
24 Order -- or the 2023 As-Applied met any threshold level
25 of conservatism?

1 A. I don't see that a threshold was identified,
2 nor do I see any evidence that a calculation was
3 performed to see if the appropriate level was achieved.

4 Q. Okay. What technical issues may arise from
5 not establishing these criteria?

6 A. So the technical issue is that these levels of
7 conservatism can propagate more rapidly into higher
8 levels than humans are intuitively able to understand.
9 I do some work for groundwater modeling, and there's a
10 threshold for the probability of a false positive
11 occurring in a single year. And sometimes we miss that
12 criterion by a few points, and we say, ah, you know,
13 we're close, we're close.

14 But if you calculate those out, in that case,
15 by missing that criterion only by a few points, you've
16 almost guaranteed that in the course of 10 or 20 years
17 you will have a false positive, and the regulatory
18 implication of a false positive can be severe.

19 Q. Were you able to perform any technical work
20 that would inform some policy decisions or some
21 criterion that could be established in this regard prior
22 to this hearing?

23 A. I started down that road, and I purged that
24 from my report because I didn't have time to do a good
25 enough job to present it, you know, where it may have a

1 consequence.

2 Q. Okay. Is it your belief that the -- that that
3 analysis could have informed the Department on things it
4 could do to establish some criterion?

5 A. Yes.

6 Q. But you were unable to do that?

7 A. I was unable.

8 Q. Time constraints?

9 A. Time constraints.

10 Q. Very good.

11 Is there any other items in your report that
12 you would like to present at this time?

13 A. Let me just quickly thumb through here. I
14 know that we all have other places we'd rather be.

15 There is one.

16 Q. Okay.

17 A. So there's been discussion about when would
18 the Department have been available to perform analyses
19 on a one-month basis, and there's two sides to that
20 question. When would the model have been capable of
21 performing such analyses. The answer to that question
22 is since 1999. Actually, there's three.

23 One is when could that have been done with a
24 model that was calculated on at least that time step --
25 or stress period. And the 1999 model was, the 2005,

1 2006 models were not. Though they could have been
2 implemented that way, they were not calibrated that way.

3 The 2013 model was calibrated to one-month
4 stress periods, so that's the answer of when could it
5 have been done. The answer to when would it have been
6 reasonable to do it depends on the criterion of
7 accuracy, which is an administrative decision that can
8 be informed technically that, to my knowledge, has not
9 been made, and so I can't answer that question.

10 Q. And is that relevant to your discussion about
11 the technical defensibility of moving to transient?

12 A. Yes. And I think there was some confusion in
13 earlier testimony that may have not been possible until
14 2021, and the fact is that it's been possible for many
15 years.

16 MR. JOHNS: At this time I'd like to move to
17 admit Exhibit 500, Bryce's expert report.

18 HEARING OFFICER: Any objection to the
19 admission of the document marked as Exhibit 500?

20 Hearing no objection, the document marked as
21 Exhibit 500 is received into evidence.

22 (Exhibit 500 received.)

23 MR. JOHNS: Mr. Director, I don't have any
24 further questions at this time. I reserve the right for
25 any redirect.

1 HEARING OFFICER: Does the groundwater group
2 wish to question Mr. Contor at all?

3 Mr. Harris?
4

5 CROSS-EXAMINATION

6 QUESTIONS BY MR. HARRIS:

7 Q. Good afternoon, Bryce. I have just a few
8 questions about one aspect of your testimony here today.

9 You testified about supplemental groundwater
10 use in the Methodology Order --

11 A. Yes.

12 Q. -- do you recall that testimony?

13 A. Yes.

14 Q. And as I recall, the Methodology Order doesn't
15 have any supplemental groundwater use in it currently;
16 correct?

17 A. There's -- the actual process does not
18 consider supplemental groundwater.

19 Q. But it says that it may consider it?

20 A. Yes.

21 Q. And based on your employment with IWRRI, IDWR,
22 and in your private consulting, have you become familiar
23 with GIS programs?

24 A. Yes.

25 Q. Could you just describe what those programs

1 generally entail?

2 A. So they are computer programs that allow you
3 to display spatial data in its spatial relationship and
4 to produce maps. You can perform analyses. For
5 instance, you could have a spatial representation of
6 evapotranspiration. You could subtract from that a
7 spatial representation of precipitation.

8 You could find out -- you could -- if IDWR has
9 plotted a point in its data, you could see on a map
10 where that point lies, and you could analyze its
11 inclusion or exclusion or its proximity to any other
12 feature of interest.

13 Q. And so a GIS shapefile is a polygon that the
14 program creates and then talks to the underlying aerial
15 photo; correct?

16 A. Yes.

17 Q. And different shapefiles or polygons or, you
18 know, points, and there's also lines; correct?

19 A. Correct.

20 Q. And you're also familiar, through past
21 experience, on how water rights are described?

22 A. Yes.

23 Q. And that would include a place of use?

24 A. Yes.

25 Q. And in the water right report, it describes it

1 as the number of acres per quarter quarter; correct?

2 A. Most do. Some large ones omit that detailed
3 listing.

4 Q. Right. And so a shapefile -- so, for example,
5 if a water right says there's 30 acres authorized to be
6 irrigated in this 40-acre tract, a shapefile polygon for
7 the place of use would actually depict which 30 of the
8 40 are authorized; correct?

9 A. It depends on whether it's a shapefile showing
10 the actual irrigated parcel or if it's showing a
11 permissible place of use. So I've seen water rights
12 where the shapefile draws a boundary, maybe the boundary
13 is 8,000 acres, and then the water right says within
14 this box, you may irrigate 5,000.

15 Q. Correct. But on a private decreed -- say a
16 groundwater right --

17 A. Yes.

18 Q. -- that does not have a permissible place of
19 use, it would depict, in my example, which 30 of the
20 40 acres --

21 A. Yes, that's correct.

22 Q. And so in this case there would be -- if there
23 were groundwater rights within the Twin Falls Canal
24 Company service area, places of use of those water
25 rights would be depicted with shapefiles; correct?

1 A. Yes.

2 Q. And would it be difficult, in your view, to do
3 some sort of a clip or an overlap to see where those
4 acres overlap with the, say, 2017 shapefile or any other
5 shapefiles generated by the Department?

6 A. That would be a very straightforward
7 operation.

8 Q. In fact, my office did it -- would it surprise
9 you to know it took about an hour to do that?

10 A. Why so long?

11 Q. It's not hard to do; right?

12 A. No.

13 Q. So at a minimum, you'd have a starting point
14 of which water right places of use overlap with the Twin
15 Falls Canal Company place of use?

16 A. Yes.

17 Q. And do you agree that would be a starting
18 point for determining whether there is supplemental
19 irrigation occurring within the Twin Falls Canal Company
20 area?

21 A. Yes.

22 MR. HARRIS: I have no further questions.
23 Thank you.

24 HEARING OFFICER: Other questions from the
25 groundwater group?

1 Cross-examination for the Surface Water
2 Coalition?

3 Mr. Thompson?
4

5 CROSS-EXAMINATION

6 QUESTIONS BY MR. THOMPSON:

7 Q. Good afternoon, Mr. Contor. Travis Thompson
8 for A&B Irrigation District, et al. Just a few
9 questions today, Mr. Contor.

10 When were you hired by Bonneville-Jefferson
11 Groundwater District?

12 A. It was probably December or January --
13 December of 2020 -- well, we've done work for the
14 district in the past, and I don't recall when that was,
15 but I started working in earnest on these issues in
16 December, maybe November of 2022, maybe as late as
17 January of 2023.

18 Q. And do you know, at least for purposes of the
19 Surface Water Coalition delivery call, did
20 Bonneville-Jefferson Ground Water District use
21 Ms. Sigstedt and Mr. Higgs until that time?

22 A. I don't know. I know that they have used
23 Mr. Higgs and still do for various functions. I don't
24 know the nature of their relationship with Ms. Sigstedt.

25 Q. Have they retained any other consultants, to

1 your knowledge?

2 A. I think that they have. They're working on
3 some projects unrelated to this that I think they have
4 other folks working on.

5 Q. Do you know who that is?

6 A. I don't.

7 Q. What sort of projects?

8 A. So one of the project is a --

9 MR. JOHNS: Objection. I'd like to raise an
10 objection. I think this kind of goes outside the scope
11 of what was presented on direct.

12 HEARING OFFICER: Well, I think these are
13 preliminary questions about where Mr. Contor has worked
14 and for whom. Those were questions that were asked of
15 him initially. Overruled.

16 Mr. Thompson.

17 Q. (BY MR. THOMPSON) I'm just curious. You had
18 a list of four projects that you were tasked to do for
19 this proceeding, and you've referenced they have other
20 consultants, and you're aware of some projects that are
21 being worked on. I'm just curious what those are?

22 A. So there's a piping project, there is a well
23 design project. I don't think they've hired someone. I
24 made recommendations. My understanding is that
25 Mr. Higgs continues to perform their hydrographer

1 services. He still performs some analyses for them.
2 Often I will hear somebody did this task, and I don't
3 know whether they did it for Bonneville-Jefferson or if
4 they did it for Idaho Ground Water Appropriators. So
5 that's the extent of my knowledge.

6 Q. Thank you. Is a diversion volume of
7 5 acre-feet per acre for a large open canal system in
8 the Snake River Basin reasonable, in your opinion?

9 A. So it would depend on the system, but it could
10 be.

11 Q. Is that a common value for canals in Water
12 District 1?

13 A. I think so.

14 Q. About 7 acre-feet?

15 A. I don't think that's unheard of.

16 Q. How about 10?

17 A. I don't think that's unheard of.

18 Q. Are those values reasonable?

19 A. You know, reasonable depends upon some
20 criterion. And I think -- I haven't been asked to
21 evaluate criteria. You haven't provided me criteria. I
22 think there are criteria under which 10 could be
23 considered reasonable.

24 Q. And you've testified you're familiar with the
25 groundwater model and its prior versions; is that

1 correct?

2 A. Yes.

3 Q. You worked on water budgets for the model
4 while you were at IWRI?

5 A. I did.

6 Q. And you were -- presented those design
7 documents to the Eastern Snake Plain technical
8 committee; is that correct?

9 A. Yeah, the ones that I authored, I did.

10 Q. And you have been using the transfer tool that
11 the Department's created; is that correct?

12 A. I have been.

13 Q. And that tool relies upon the model; is that
14 your understanding?

15 A. Yes.

16 Q. And that tool looks at impacts to river
17 reaches?

18 A. Well, so years ago, I was severely chastised
19 for using the word "impact" because it has legal
20 meanings. I would say that that transfer tool estimates
21 effects or accruals.

22 Q. A response from a change in an aquifer
23 condition resulting to the river, would that be --

24 A. So if a volume of water is put into the
25 aquifer or removed from the aquifer, the tool estimates

1 when and where that would be expressed at the river
2 or -- at the parts of the river and springs that are
3 represented in the model.

4 Q. And has that been an acceptable use of the
5 model?

6 A. Well, again, it has been accepted -- I've
7 never liked it, but it has been accepted.

8 Q. And do you use for it for clients in transfer
9 application?

10 A. I have.

11 Q. Has that been approved by the Department?

12 A. Yes.

13 Q. So you indicate in your report that the 1999
14 version of the model was created to be, quote, a
15 planning and management tool; is that correct?

16 A. Yes.

17 Q. And I think you testified earlier with
18 Mr. Johns that you stated management could be
19 administration?

20 A. That's my opinion. That's not what was stated
21 in those documents.

22 Q. So is the term "management" similar to
23 administration?

24 A. I don't think so. I think they are different,
25 but it's been my experience that, in Idaho, we use the

1 word "management" when we mean "administration."

2 Q. And the Department's conjunctive management
3 rules use the word "management"; is that correct?

4 A. They do.

5 Q. So would you agree that the Department has
6 used the ESPAM model for conjunctive administration for
7 over a decade?

8 A. Yes.

9 Q. Would you agree that Idaho courts have
10 approved the Director's use of the model for that
11 purpose?

12 A. Yes.

13 Q. Would you agree that ESPAM2.2, which I think
14 is the most current version of the model, can be used to
15 represent temporary curtailment of groundwater rights?

16 A. Yes.

17 Q. And is that what is referred to as the
18 transient use of the model?

19 A. Yes.

20 Q. Looking at specific reaches -- and you're
21 familiar with how that model is calibrated to different
22 reaches; is that correct?

23 A. Yes.

24 Q. -- would you agree that it's better calibrated
25 to the near Blackfoot to Neeley reach compared to the

1 Neeley to Minidoka reach?

2 A. Yes.

3 Q. Would you agree that in the near Blackfoot to
4 Neeley reach, that contains the majority of the springs
5 and aquifer discharge --

6 A. Yes.

7 Q. -- between those two reaches?

8 So you talked about the R-squared values for
9 those two reaches in that calibration document.

10 A. Yes.

11 Q. And it's in your report; is that correct?

12 A. Yes.

13 Q. Would you agree that those reaches'
14 calibration values are within the range of values for
15 upriver reaches as well?

16 A. So I looked at that, and I can't remember the
17 result. I think that the Neeley to Minidoka is amongst
18 the worst, but it's a small discharge. I think that the
19 near Blackfoot to Neeley is neither the best nor the
20 worst, but that may be incorrect. I, again, was
21 constrained by time. I wish I could have done a better
22 job.

23 Q. Let's turn to your Exhibit 512 when you get a
24 second. It will be page 125.

25 A. Okay. I need a different book.

1 Okay. I have 512 here.

2 Q. I'm looking at page 125 of 190.

3 A. Oh, it's double-sided. That confuses me.

4 Okay. Here we are.

5 HEARING OFFICER: Let me find that. And it's
6 page what, 125?

7 MR. THOMPSON: 125. I think they're
8 Bates-stamped on the bottom.

9 Q. (BY MR. THOMPSON) Mr. Contor, I believe these
10 pages show the different river reaches -- I'll say above
11 Milner and the different R-squared values assigned for
12 the observed and model results; is that correct?

13 A. Yeah, starting with page 125 and then
14 continuing for a few pages, yes.

15 Q. I guess my question was the near Blackfoot to
16 Neeley within those range of values represented by those
17 different reaches?

18 A. Yeah. And so we can look -- so Ashton to
19 Rexburg is .16, so it's above that; Heise to Shelley is
20 .61, so it's below that; Shelley to near Blackfoot is
21 .21, so it's above that; near Blackfoot to Neeley, 42,
22 as we discussed; Neeley to Minidoka, .0079.

23 So I -- without the specifics, my
24 representation, I think, was correct that it's neither
25 the best nor the worst. The near Blackfoot to Neeley is

1 neither the best nor the worst.

2 Q. And you testified you recommended a .5
3 R-squared value would be useful; is that correct?

4 A. That was an initial starting point. The
5 actual determination of the threshold is administrative,
6 but from a technical basis, that's a useful starting
7 point.

8 Q. And has a certain criteria been evaluated by
9 the modeling committee?

10 A. Not that I know of.

11 Q. Is it true they've accepted this model and the
12 R-squared values for these various reaches?

13 A. So there's a long answer and a short answer.
14 The short answer is that the committee, some of us with
15 some reluctance, agreed to endorse ESPAM2.2 as a
16 replacement for ESPAM2.1, acknowledging -- all of us
17 acknowledging that there are things that we wish we
18 could do better.

19 Q. So you talked about some comparisons of the
20 two versions and that some versions varied by a factor
21 of 5. Was that just for specific cells?

22 A. So if you look at the response from one cell
23 to the reach, that was the analysis I performed. I did
24 not have time to perform a regional analysis. But the
25 way the model is configured, adjacent cells will have

1 similar results, and as you broaden that circle, the
2 variability between the cells increases. But, yes, that
3 was -- I performed that analysis on -- well, I had that
4 analysis performed, and I reviewed it on just a small
5 number of single cells.

6 Q. So has 2.2 been accepted as a better
7 representation of aquifer changes and river responses?

8 A. I think it's been accepted that it should be
9 moved forward because it ought to be better. And I
10 think there are people who believe that it is better.
11 In the particular case of near Blackfoot to Neeley, the
12 R-squared value is better. To the extent that that
13 reflects, as Sophia said, answering the -- getting the
14 right result for the right reasons, then it appears to
15 be better.

16 Q. And that work continues today on the model; is
17 that correct?

18 A. Yes.

19 Q. Is it your opinion that a model should only be
20 used when a, quote, ratio of relief to cost is
21 considered?

22 A. It's my opinion that any tool should be --
23 when any tool is deployed, the gravity of the use of
24 that tool should be weighed in terms of the precision of
25 that tool. If I'm tapping on the carburetor of a

1 motorcycle, a crescent wrench is acceptable. If I have
2 the opportunity to touch a million-dollar Ferrari, I
3 would not tap on the carburetor with a crescent wrench.

4 Q. Is that, essentially, a cost-benefit analysis
5 of what is more efficient?

6 A. It is a recognition of the principle that
7 benefit -- it's a recognition of the principle that some
8 calculations have tremendous gravity, both for the party
9 seeking relief and the party being required to provide
10 relief. And if you have a tool that doesn't work very
11 good, it's sobering to pull the trigger and wonder where
12 the bullet's going to hit.

13 Q. What type of gravity are you referring to?

14 A. I'm talking about the Surface Water Coalition
15 in some years being indicated to be short by, perhaps, a
16 quarter-million acre-feet of water. That's a serious
17 block of water and could have serious consequences to
18 folks needing that water and not receiving it.

19 Q. So you referenced the -- I guess -- the
20 efficiency or how to use water that using 2 acre-feet
21 may not be as efficient as 1 acre-foot?

22 Is that --

23 A. So I didn't mean to say that. I -- do you
24 want a long answer, or do you want a short answer?

25 Q. Well, I think you have the general idea that,

1 hey, if we use groundwater more efficiently or for more
2 acres, we shouldn't curtail -- we shouldn't curtail a
3 lot of groundwater to produce less surface water; is
4 that generally correct?

5 A. That wasn't what I meant to say.

6 Q. Okay. I must have misunderstood it, then.

7 So you're not advocating that water users
8 should just abandon surface water systems and go to
9 groundwater; that's not what you're saying?

10 A. No.

11 COURT REPORTER: Okay. Wait. Can you repeat
12 your question?

13 Q. (BY MR. THOMPSON) You are not suggesting that
14 surface water users abandon their surface water supplies
15 and just transition to groundwater?

16 A. No.

17 Q. A few questions about supplemental groundwater
18 use you talked about with Mr. Johns.

19 Your opinion -- your report identifies that
20 measurement of groundwater use today is more reliable
21 than it was in the early 2000s; is that correct?

22 A. Yes.

23 Q. And do you know when groundwater pumping data
24 is available during the irrigation season?

25 A. So my understanding is that an individual

1 grower or a hydrographer can go to a meter at any time
2 and read it, that it's recorded -- or reported annually,
3 which is very compatible with the transit time of the
4 effects of groundwater pumping.

5 Q. Could that be made available on a daily basis?

6 A. I suppose that it could. I suppose that every
7 turnout of the Twin Falls Canal Company could be made
8 available on a minute-by-minute basis. I don't know the
9 purpose, but yes, it could be done.

10 Q. Weekly? Monthly? Would that be --

11 A. It could be done.

12 Q. Are you part of the technical modeling
13 committee?

14 A. I'm part of the Eastern Snake Hydrologic
15 Modeling Committee. I am not part of the technical
16 working group for the Surface Water Coalition/Idaho
17 Ground Water Appropriators agreement.

18 Q. And I'll correct my question. I was referring
19 to the Eastern Snake Plain Modeling Committee.

20 A. Yes, I'm a member of that.

21 Q. And have there been suggestions in those
22 meetings to update the model with measured pumping data?

23 A. There have been discussions. I don't know
24 that -- suggestions -- maybe suggestions, but certainly
25 discussions.

1 Q. Do you know why that hasn't been adopted?

2 A. I don't know all the reasons.

3 Q. Would that sort of data make it more reliable?

4 A. From the context of groundwater modeling,
5 probably not.

6 Q. Is the priority date of a supplemental well an
7 appropriate consideration?

8 A. I think so.

9 Q. Would you agree if that well was subject to a
10 curtailment, that would affect its availability?

11 A. I think it would, and I think the WMIS data
12 would reflect that.

13 COURT REPORTER: The what?

14 THE WITNESS: W-M-I-S. I'm sorry.

15 Q. (BY MR. THOMPSON) So going back to the ETRAN
16 model, you've used that in your report, and I understand
17 that to be just a comparison between two versions of the
18 model.

19 You were using two versions of the ETRAN tool;
20 is that correct?

21 A. That's what I did in the report, yes.

22 Q. And it provides for transient responses from
23 the aquifer to the river; is that correct?

24 A. Yes.

25 Q. And it's true that wells near the river will

1 have their responses realized sooner than wells located
2 farther away; is that correct?

3 A. Yes.

4 Q. That's what your analysis showed?

5 A. It did show that. That wasn't the purpose for
6 the analysis, but that's one of the implications of the
7 results.

8 Q. You talked about the Fifth Order and your --
9 you testified you did not have time to confirm the
10 estimates identified in the Fifth Order relating to the
11 steady state use of the model for the May to September
12 accrual.

13 Do you recall that?

14 A. So I think it was the transient model that was
15 used to estimate those accruals, but I did not have time
16 to repeat those runs.

17 Q. I think there was a 9 to 15 percent number
18 identified by the Department?

19 A. Yes.

20 Q. And you could replicate that if you wanted to;
21 is that correct?

22 A. If I had time, I could.

23 Q. Do you have any reason to question that
24 modeling run or those results?

25 A. No.

1 Q. But it's your opinion that the modeling runs
2 should be consistent both for determining the
3 curtailment date and then for apportioning mitigation
4 responsibility?

5 A. Yes.

6 Q. So in looking at the two types of uses of the
7 model, would a steady state curtailment run produce the
8 demand shortfall in the same irrigation season if direct
9 mitigation is not provided?

10 A. Not if it was as is currently done on a
11 single-event basis. But for many curtailments, neither
12 would a transient analysis.

13 Q. And that would depend on the location of the
14 well being curtailed?

15 A. It would depend on the quantity of relief
16 needed by the Surface Water Coalition.

17 Q. And the Department's order identified a
18 December 30th, 1953, priority date --

19 A. For this particular shortfall.

20 MR. THOMPSON: That's all the questions I
21 have. Thank you.

22 HEARING OFFICER: Further cross-examination?

23 MR. FLETCHER: I don't have any further.

24 HEARING OFFICER: Mr. Fletcher? Mr. Simpson?

25 Redirect?

1 MR. JOHNS: Just briefly.

2
3 REDIRECT EXAMINATION

4 QUESTIONS BY MR. JOHNS:

5 Q. Bryce, Mr. Thompson asked you if the courts
6 have approved the model, to your knowledge.

7 Do you remember that question?

8 A. Yes.

9 Q. Do you know if the courts have approved the
10 model since its implemented transient analysis, as used
11 in the Fifth Methodology Order?

12 A. I do not know.

13 Q. So to your knowledge, that hasn't been
14 approved yet?

15 A. To my knowledge, it has not. And I do not
16 know if ESPAM2.2 has been tested in the court.

17 MR. JOHNS: Nothing else. Thanks.

18 HEARING OFFICER: Okay. I assume, based on
19 the short questions, there's no recross-exam.

20 Surface Water Coalition?

21 All right. Thank you, Mr. Contor.

22 All right. Let's just go off the record for a
23 minute.

24 (Exhibit 366 marked.)

25 HEARING OFFICER: Mr. Harris, you may question

1 Mr. Olenichak.

2 Pardon me. Oh, I do need to swear him in.

3 So, Tony, I'll have to rely on your
4 representation that you're standing. Raise your right
5 hand, please.

6 Is somebody clairvoyant out there?
7

8 ANTHONY OLENICHAK,
9 called by the City of Idaho Falls, having been first
10 duly sworn to tell the truth relating to said cause,
11 testified remotely as follows:
12

13 HEARING OFFICER: Thank you. Please be
14 seated, if you're not already.

15 Mr. Harris?
16

17 DIRECT EXAMINATION

18 QUESTIONS BY MR. HARRIS:

19 Q. Tony, can you please say and spell your name
20 for the record.

21 A. Yes. Tony, T-o-n-y, Olenichak,
22 O-l-e-n-i-c-h-a-k.

23 Q. Could you describe your educational background
24 after high school.

25 A. I spent two years at the University of

1 Maryland in their biological science program and four
2 years at Utah State University, where I obtained a
3 master of science degree in watershed science in 1983.

4 Q. And what is your current occupation?

5 A. I am both watermaster and program manager for
6 Water District No. 1.

7 Q. And how long have you held that position?

8 A. I've been watermaster for the past four years.
9 For the past 17 years, I've been program manager,
10 according to the IDWR employee records.

11 Q. What does Water District 1 do?

12 A. Water District 1 measures the natural flow in
13 the river reaches within the district each day and
14 allocates to the various reservoir and diversion and
15 water rights the amounts that they're allocated to their
16 diversions for each day of the irrigation season.

17 Q. What area of Idaho does Water District 1
18 cover?

19 A. It covers the Snake River and its tributaries
20 above Blackfoot in Idaho, in addition to the Snake River
21 main stem diversions from Blackfoot to Milner Dam.

22 Q. Does Water District 1 track fill of the Upper
23 Snake Reservoir system?

24 A. Yes, with the exception of the reservoirs in
25 the Blackfoot and Portneuf Basins.

1 Q. Prior to your election as the watermaster for
2 Water District 1, what positions did you hold within
3 Water District 1?

4 A. I was program manager from 2006 to 2019, and
5 hydrologist from 1990 to 2005.

6 Q. Are you familiar with the April joint forecast
7 issued by the United States Bureau of Reclamation and
8 the United States Army Corps of Engineers for the
9 unregulated flow at the Heise Gage?

10 A. Yes.

11 Q. Could you briefly describe what the forecast
12 consists of and what data that forecast considers?

13 A. Well, it's changed over the years. Initially
14 I think it only included the snow water equivalent
15 content at certain snow survey sites upstream from
16 Heise. Now I think it includes other factors, such as
17 soil moisture and precipitation. But it's, essentially,
18 the same as forecasting the unregulated flow that arises
19 upstream from the USGS Heise station.

20 Q. And Heise is located near the city of Ririe,
21 Idaho; correct?

22 A. Yes, just upstream from just about all the
23 major diversions in Water District 1 on the Snake River.

24 Q. And the snowpack that is discussed in that
25 forecast is measured by SNOTEL sites that are maintained

1 by the NRCS; correct?

2 A. Yes.

3 Q. And on the Water District 1 website, you have
4 links to that data; correct?

5 A. Yes.

6 Q. Okay. And do you know how those SNOTEL sites
7 measure and account for snowpack?

8 A. Yeah. They simply weigh the snow that's on
9 top of what they call a "snow pillow," and by measuring
10 the weight of the snow, you can determine the quantity
11 of water in snow.

12 Q. Tony, I'm going to have you look at a map that
13 I emailed you earlier today. It's the Mountain Snow
14 Water Equivalent map. It's been marked here as
15 Exhibit 366.

16 For the record, it is actually already in the
17 administrative record. It was contained on page 7 of a
18 motion for continuance that was filed on April 28th,
19 2023.

20 Tony, have you seen that sort of document
21 before?

22 A. Yes. And also what I mostly view as the one
23 that's issued by the NRCS, but they are, essentially,
24 the same. I think the one done by IDWR brings up the
25 snow and the subbasins above Heise also.

1 Q. So what, generally, does this map depict?

2 A. Well, it depicts the percentage of the median
3 snowpack in various basins in the Upper Snake River
4 Basin and across Idaho.

5 Q. And it's also a helpful reference for
6 different basins. What basins directly contribute to
7 the water supply of the Surface Water Coalition
8 entities?

9 A. All the basins that are tributary to the Snake
10 River above Milner Dam.

11 Q. And that would include the Henry's Fork
12 (Teton) Basin depicted on that map; is that right?

13 A. Yes.

14 Q. And the Snake Basin above Palisades, Willow,
15 Blackfoot, and Portneuf; is that right?

16 A. Yeah, I think they identify the Snake River
17 above Heise instead of Snake River above Palisades.

18 Q. Okay. And in looking at this map, does water
19 from the Henry's Fork (Teton) Basin come in below the
20 Heise Gage?

21 A. Yes.

22 Q. How about from the Willow Creek drainage?

23 A. That also comes in below the Heise Gage.

24 Q. And the same for Blackfoot?

25 A. Yes.

1 Q. And finally, the Portneuf?

2 A. Yes. They're all tributary below the Heise
3 Gage.

4 Q. And based on this map, as of April 3rd, the
5 snowpack was 124 percent of average in the Henry's Fork
6 (Teton), 120 percent for the Snake above Palisades,
7 178 percent for Willow Creek, 186 percent for Blackfoot,
8 and 216 percent for the Portneuf; is that correct?

9 A. Yeah. I don't have the map in front of me,
10 but, yeah, that seems like what I have seen in the past.

11 Q. And I believe you testified before, but I want
12 to be clear, does the April joint forecast explicitly
13 consider the water supply from the Henry's Fork, Willow,
14 Blackfoot, and Portneuf drainages or does it not
15 consider them?

16 A. No, the April joint forecast is only for the
17 watershed above the Snake River at the Heise Gage.

18 Q. Okay. I have just a few more questions.

19 In your position as the watermaster, what have
20 you observed this year in terms of water supply to the
21 Coalition members as a result of the significantly
22 above-average snowpack and runoff from the lower part of
23 the basin?

24 A. Yeah, the advantage to the water rights in the
25 Water District 1 from the runoff in those lower

1 watersheds, that supplies a greater amount of natural
2 flow to those Surface Water Coalition canals that are
3 further down on the -- on our distribution system, so
4 they don't need to draw from the natural flow that
5 arises in the upstream areas above Blackfoot, and so
6 that allows us to store more water to the junior
7 priority reservoirs upstream and -- instead of passing
8 that natural flow down to the senior priority diversions
9 downstream.

10 Q. So would you say this year that there was an
11 unusually high amount of runoff from those drainages?

12 A. Yes. The further south you go into the
13 Portneuf, the Blackfoot, and Willow Creek drainages,
14 they had a higher percentage above median values for the
15 April 1st runoff forecast than those areas further
16 upstream above Palisades.

17 Q. Did that runoff also free up other natural
18 flow rights in the basin?

19 A. Yes. What it allowed us to do is probably
20 store more water into the reservoir water rights instead
21 of having delivered that natural flow to senior priority
22 irrigation diversions. That was helped not only by the
23 snowpack but also the spring rains that we received over
24 the last couple of months.

25 Q. Great. I want to ask you just a couple more

1 questions about storage allocation.

2 Are you generally familiar with the storage
3 space held by members of the Surface Water Coalition?

4 A. Yes.

5 Q. And of the Coalition members, how about the
6 Twin Falls Canal Company?

7 A. Yes.

8 Q. Do you know, approximately, how much storage
9 space they have and in which two reservoirs?

10 A. Yeah. The two reservoirs they have space are
11 in Jackson and American Falls, approximately
12 250,000 acre-feet.

13 Q. In the As-Applied Order that is part of what
14 we're discussing today, the Director found material
15 injury to the Twin Falls Canal Company in the amount of
16 75,200 acre-feet, and of that amount, 13,324 acre-feet
17 was predicted of space that would not fill.

18 As of today, has all of Twin Falls Canal
19 Company's storage space filled?

20 A. Yes.

21 Q. Is it possible that that fill determination
22 could be affected by a flood control spill from Jackson
23 Lake?

24 A. Yes. In the big runoff years, the Bureau of
25 Reclamation sometimes has to evacuate previously stored

1 water out of Jackson for flood control, and if it's lost
2 out of the system, that can result in a reduction from a
3 full allocation to the space holders, Twin Falls Canal.
4 But that seems unlikely at this point in time but could
5 change if we get a lot of rain here over the next couple
6 of weeks.

7 Q. Great.

8 MR. HARRIS: Director, that's all the
9 questions I have. I would move to admit Exhibit 366
10 into the administrative record.

11 HEARING OFFICER: Any objection to the snow
12 water equivalent map marked as Exhibit 366? Any
13 objection to its admission?

14 Hearing none, the document marked as
15 Exhibit 366 is received into evidence.

16 (Exhibit 366 received.)

17 MR. HARRIS: That's all the questions I have.
18 Thank you, Tony.

19 HEARING OFFICER: Any cross-examination by the
20 Surface Water Coalition?

21 Mr. Budge?

22 MR. BUDGE: Yes. IGWA also identified Tony as
23 a witness, so perhaps I'll just do my direct examination
24 and the Coalition can handle their cross in one fell
25 swoop.

1 HEARING OFFICER: Okay.

2
3 DIRECT EXAMINATION

4 QUESTIONS BY MR. BUDGE:

5 Q. Good afternoon, Tony. I don't know if you can
6 see me or not, but this TJ Budge. How are you?

7 A. Yes, I can see you. Thank you, TJ.

8 Q. Okay. I just got a couple questions.

9 The first one follows up on Mr. Harris's
10 questions about the storage water supplies. I
11 understand as your duties -- among your duties as Water
12 District 1 watermaster, you oversee the Upper Snake
13 River storage water system?

14 A. Yes. We keep track of the amount of natural
15 flow that accrues to those reservoir water rights.

16 Q. And are rentals or leases of storage water
17 handled through your office?

18 A. Yes.

19 Q. You're generally familiar with how the
20 transactions of storage water in the Upper Snake River
21 Basin are handled from year to year?

22 A. Yes.

23 Q. Are you familiar with the 2004 Nez Perce water
24 rights agreement?

25 A. Somewhat, yes, I'm familiar with it.

1 Q. Are you aware that storage water is frequently
2 leased out of the Upper Snake River Reservoir system to
3 meet some flow augmentation requirements under that Nez
4 Perce agreement?

5 A. Yes.

6 Q. Do I understand correctly that participation
7 in rentals of storage for flow augmentation under that
8 agreement is a voluntary program?

9 A. Yes.

10 Q. And do members of the Surface Water Coalition
11 frequently participate in renting storage water?

12 A. Yes.

13 Q. And I believe those who do participate in that
14 program receive rent on the storage water they lease?

15 A. If you mean payment, yes.

16 Q. Okay. That's all I had on that topic.

17 The other topic that I wish to ask you about
18 is just about the application of the futile call
19 doctrine in the Teton River Basin?

20 I understand that water distribution in the
21 Teton River Basin falls under your jurisdiction as the
22 Water District 1 watermaster?

23 A. Yes.

24 Q. Are you familiar with the application of the
25 futile call doctrine in the Teton River Basin?

1 A. Yes.

2 Q. Could you explain how that works?

3 A. Yes. If you look at the Teton Basin as a
4 whole, the lower part of the basin, the downstream part
5 of the basin was developed earlier than the upper part
6 of the basin. So the Teton River, typically towards
7 midsummer/end of the summer, can cut down to the 1885,
8 1884 priorities, and so the entire flow or natural flow
9 in the Teton Basin was used up after those years.

10 As the upper part of the basin was settled and
11 they developed water rights on the tributaries that fed
12 the Teton River, they had -- they were later in time,
13 had later priorities than the diversions off the Teton
14 River downstream. But those tributaries that they
15 diverted water from, typically in midseason, even when
16 there's no diversions from them, that water and those
17 tributaries doesn't reach the main stem of the Teton
18 River.

19 So you have a situation where this irrigation
20 that was developed in the Upper Teton Basin on these
21 tributaries, when they go out of priority on the main
22 stem of the Teton River if we shut off all those
23 diversions on the tributary and the water still doesn't
24 reach the channel of the Teton River, we say it's futile
25 for the lower senior priority diversions to call for

1 curtailment of those junior priority water rights on
2 those tributaries when shutting off those junior
3 priorities won't make a difference to the water
4 physically reaching the Teton River channel.

5 Q. Thanks, Tony. That's very helpful.

6 Just for clarification. When you refer to the
7 Upper Teton Basin, you're referring to that area in the
8 Driggs-Tetonia area?

9 A. Yes. That whole upper valley before the river
10 reaches the canyon where it narrows down.

11 Q. And then when you refer to the Lower Teton
12 Basin, is that down in the, you know, Teton-Sugar City
13 area?

14 A. Yes. It's where the water emerges out of the
15 canyon there and into the valley there in Newdale,
16 Teton, Rexburg, Sugar City, that whole area.

17 Q. Okay. And then you mentioned that the call
18 becomes futile once the tributary doesn't reach the main
19 stem. You're referring to the surface water connection
20 between the tributary and the main stem of the Teton?

21 A. Yes.

22 Q. And how do you know when the tributaries
23 disconnect?

24 A. It is visual. You get to a point -- well,
25 over the years, the deputy watermaster in that area

1 responsible for regulating the diversion usually has a
2 sense of when he shuts off all the diversions, water
3 won't reach the Teton River. And so at that point the
4 tributary is on a different priority system than the
5 Teton River.

6 If that judgment is contested, then we
7 actually go through and do a process where we shut off
8 all the diversions on that tributary and let the water
9 run for a certain amount of days. Sometimes it's been
10 three days in the past, it's been as long as five days,
11 and after that three- or five-day period, if the water
12 still hasn't reached the Teton River from that
13 tributary, then we call a futile call, and then we start
14 turning on diversions on that tributary according to
15 priority until all of the water is diverted.

16 Q. When the tributaries don't reach, is that
17 because the water is just sinking into the ground?

18 A. Yes. At some point, usually further upstream
19 on the tributary in the higher elevations above your
20 irrigation land, you'll see water -- plenty of water in
21 those tributaries. And then as it moves further
22 downstream into the valley before it reaches the Teton
23 River, it just completely sinks into the ground.

24 Q. Do you have any idea where it goes once it
25 sinks?

1 A. I don't.

2 Q. Are there a lot of springs along the main stem
3 of the Teton River in that upper basin that feed the
4 river?

5 A. Yes, there are some springs.

6 Q. Is it your understanding that the water that
7 seeps into the ground from those tributaries accrues to
8 the Teton River downstream through a spring in flow?

9 A. Yes, that's certainly likely.

10 Q. Just one last question, Tony. Did you
11 contribute in any way to the development of the Fifth
12 Methodology Order?

13 A. No.

14 Q. You weren't asked any questions by folks at
15 the Boise office as they were developing that?

16 A. No. I think the only time we get questions
17 concerning the data that goes into that concerns our
18 storage carryover numbers. [Unintelligible.]

19 COURT REPORTER: Wait. Excuse me. Hold on.
20 Wait.

21 HEARING OFFICER: Tony, the court reporter.

22 COURT REPORTER: I'm sorry, but I missed some
23 of your answer a while back. So I can read what I have,
24 and then I need you to go from there.

25 "Answer: No. I think the only time we get

1 questions concerning the data that goes into that
2 concerns our storage carryover numbers."

3 THE WITNESS: I'm having trouble hearing you.
4 You need to get closer to the microphone.

5 COURT REPORTER: Okay. So: "Answer: No. I
6 think the only time we get questions concerning the data
7 that goes into that concerns our storage carryover
8 numbers."

9 THE WITNESS: Yes.

10 COURT REPORTER: And then can you keep going
11 from there.

12 THE WITNESS: They may have asked some other
13 questions about storage allocations or water delivery to
14 that effect, but as far as how the model works, you
15 know, what equations are incorporated into it and what
16 the output is, no, they don't share that information
17 with us.

18 MR. BUDGE: I don't have any further
19 questions.

20 HEARING OFFICER: Thank you, Mr. Budge.

21 Any cross-examination, Surface Water
22 Coalition?

23 Mr. Thompson, if you'll come forward.

24 ///

25 ///

1 CROSS-EXAMINATION

2 QUESTIONS BY MR. THOMPSON:

3 Q. Hi, Tony. This is Travis Thompson for A&B
4 Irrigation District, et al.

5 Can you hear me?

6 A. Yes, I can. Thank you.

7 Q. You talked about, with Mr. Harris, the joint
8 Heise forecast. Is that something you look at every
9 year?10 A. Yes. We use that to determine how much flow
11 augmentation volume is available to the Bureau each
12 year.

13 Q. And do they issue that forecast monthly?

14 A. No. They do it annually, usually the week
15 following April 1st.

16 Q. So the Bureau doesn't revise that in May?

17 A. Well, they -- well, yes, but that's not the
18 April 1st forecast; that's the May forecast.19 Q. That was my question. They do it monthly for
20 a period of time starting in January?21 A. Yeah. I have heard, yeah, but I don't pay any
22 attention, usually, to those forecasts. It's only the
23 April 1st forecast that I use in my job.24 Q. So you didn't look at the May forecast to see
25 if it went down or not compared to April?

1 A. I did not.

2 Q. Mr. Budge asked you questions about the rental
3 pool and the Nez Perce agreement.

4 Do you recall those?

5 A. Yes.

6 Q. And under the rental pool procedures, do space
7 holders have the ability to opt out of that rental pool?

8 A. Yes.

9 Q. In the context of the Surface Water Coalition,
10 if they are injured and were to receive a storage
11 mitigation assignment, could they receive that if they
12 were not a participant in the common pool?

13 A. I don't know the answer to that question.

14 Q. Do the current procedures address that?

15 A. Well, to receive water, I don't think you need
16 to be a participant. But to supply water, you do need
17 to be a participant.

18 Q. So it's your testimony if somebody were to opt
19 out of the rental pool, they could still receive a
20 storage assignment if it was for mitigation purposes; is
21 that true?

22 A. Yes.

23 Q. I think we emailed you a PDF. Do you have a
24 copy of that, Tony?

25 A. A TDF? What's --

1 Q. A PDF file. I'm sorry.

2 A. Oh, PDF file. Thank you. Yeah, the
3 watermaster report?

4 Q. Yes.

5 MR. THOMPSON: I'm just going to mark that as
6 Exhibit 8.

7 (Exhibit 8 marked.)

8 Q. (BY MR. THOMPSON) And I'll represent to you,
9 Tony, it's an excerpt from the 2011 annual report.

10 Have you had a chance to look at that?

11 A. Yes.

12 Q. And are you familiar with that document?

13 A. Yes.

14 Q. And can you identify it for the record?

15 A. It's an excerpt from the 2011 annual report of
16 Water District 1 prepared by watermaster Lyle Swank.

17 Q. And does the water district keep this kind of
18 information since that time?

19 A. Yes.

20 Q. And is that published?

21 A. Yes.

22 Q. And can you generally describe what those
23 tables depict?

24 A. Those tables depict the amount diverted by
25 each for diversions that are in our water right

1 accounting program.

2 Q. And are you familiar with the various canals
3 and pumps listed in this exhibit?

4 A. Yes.

5 Q. And recognize that every year is different,
6 but generally do these canals convert similar amounts
7 every year?

8 A. Yes. Somewhat it varies just a little bit by
9 water supply. Sometimes they're limited by water
10 supply, and sometimes they're not.

11 Q. Do large open canal systems represented on
12 this exhibit have different diversion needs compared to
13 individual pumps?

14 A. Yes.

15 Q. Would that be reflected on the acre-feet per
16 acre diverted column?

17 A. The acre-feet per acre diverted is simply the
18 calculation of the volume that was diverted at the head
19 of the canal and the amount of acres that the Water
20 District 1 had on record at one point that the canal
21 irrigated. But the problem with that acre-foot per acre
22 diverted is we didn't know in any of these years these
23 annual books were published the actual amount of acres
24 that were being irrigated by the diversion.

25 Q. So the service area lists a number that may or

1 may not reflect the actual irrigated acres in a given
2 year?

3 A. Right. That's the number that represents the
4 maximum number of acres that could be irrigated by the
5 diversion, but not, necessarily, the number of irrigated
6 acres during that year.

7 Q. Based on your experience as watermaster, are
8 any of these values unreasonable for the canals listed?

9 MR. HARRIS: Objection.

10 THE WITNESS: No. But at some point in the
11 future years, we stopped listing those acres because --

12 MR. HARRIS: I'd like to lodge an objection.

13 THE WITNESS: -- because it gave some people
14 the impression that those were the actual amount of
15 acres being irrigated --

16 HEARING OFFICER: Just a moment, Tony. Sorry.

17 Okay, Mr. Harris.

18 MR. HARRIS: We called Tony as a fact witness
19 to talk about the contribution of the natural flow from
20 those lower drainages. We did not identify him as an
21 expert to talk about rate-per-acre diversions or
22 anything like that. So I think this goes beyond the
23 scope of my examination.

24 HEARING OFFICER: That's true, Mr. Harris. Do
25 you want me to allow the Surface Water Coalition to call

1 Tony as their own witness down the road if they choose
2 to do that to explore this?

3 MR. FLETCHER: We'd do it today as soon as
4 he's done here.

5 MR. HARRIS: I don't believe they identified
6 him, but maybe I'm mistaken.

7 MR. FLETCHER: You did.

8 HEARING OFFICER: Well, I'm not restricting
9 testimony.

10 MR. HARRIS: Okay.

11 HEARING OFFICER: Overruled.

12 MR. THOMPSON: Tony, thank you. That's all
13 the questions I have.

14 MS. MCHUGH: I have a quick question.

15 MR. FLETCHER: I just have a question.

16 Did his last answer get on the record,
17 Mr. Olenichak's last answer?

18 HEARING OFFICER: I didn't hear it.

19 COURT REPORTER: Well, it's kind of chopped up
20 with speaking in between trying to interrupt him. So
21 not --

22 MR. FLETCHER: To clear that up, can you ask
23 that question so it's on the record.

24 Q. (BY MR. THOMPSON) Tony, I think we were
25 talking about the acre-foot diverted of the service

1 area, recognizing that these service area number of
2 acres list a potential maximum number of acres within
3 these canals. And I was asking you if there's any
4 contention that any of these diversion rates are
5 unreasonable by these canals.

6 A. Yeah. And again, my answer was that the
7 service areas, it may be the maximum service area of the
8 canal but not, necessarily, the number of irrigated
9 acres. And that acre-foot-per-acre-diverted number that
10 you see in the far-right column is based on the
11 assumption that all those acres are being irrigated by
12 the volume that was diverted and the acre-feet in the
13 first column, and that may not, necessarily, be the case
14 if the canal was irrigating less acres than the maximum
15 that was listed on this table.

16 Q. So that could change the acre-foot-per-acre
17 calculation; is that correct?

18 A. Correct.

19 Q. I guess in your experience with the values
20 represented in this exhibit, do you believe any of those
21 are unreasonable?

22 A. I don't know how to answer that.

23 MR. BUDGE: Objection.

24 HEARING OFFICER: Tony, this is difficult.

25 We've got another objection.

1 The basis for the objection?

2 MR. BUDGE: Well, it calls for a legal
3 conclusion. But I think Tony explained that he
4 doesn't -- he can't answer that question, so he
5 recognized it as such.

6 HEARING OFFICER: Okay. I want the answer on
7 the record again, because I had to interrupt the
8 testimony to address the objection.

9 So ask it again, Mr. Thompson, and let's get
10 his answer.

11 Q. (BY MR. THOMPSON) And, Tony, this table shows
12 total volumes diverted by canals all throughout Water
13 District 1.

14 Do you have any reason to contend any of these
15 values are unreasonable?

16 A. The volumes are accurate. The service area
17 probably represents the maximum number of acres that can
18 be irrigated, but not, necessarily, the actual number of
19 acres that were irrigated in this particular year. And
20 therefore, since the total diverted was divided into the
21 service area acres that were listed, the acre-foot per
22 acre diverted in that last column may not be accurate
23 since we don't know for certain the number of acres that
24 were actually irrigated in this particular year. And in
25 future years, we stopped listing this acre-foot acre

1 diverted for that reason.

2 Q. Yeah. I don't know if you answered my
3 question, Tony.

4 I guess the volumes represented, they all
5 vary. I think they go from like 1 to above 10.

6 Do you have any reason to believe any of those
7 values are unreasonable for those canals listed?

8 A. No.

9 Q. Thank you.

10 MR. FLETCHER: Do you want to admit that
11 exhibit?

12 MR. THOMPSON: Yeah.

13 I'd move to admit Exhibit 8.

14 HEARING OFFICER: Any objection to receiving
15 Exhibit 8 into evidence?

16 Hearing no objection, the document marked as
17 Exhibit 8 is received into evidence.

18 (Exhibit 8 received.)

19 HEARING OFFICER: Mr. Fletcher, you have
20 questions?

21 MR. FLETCHER: I do.

22 HEARING OFFICER: Would you come to the table.
23 Thank you. I know you like to examine watermasters or
24 former watermasters.

25 MR. FLETCHER: Yeah. Well, that's -- yeah.

1 HEARING OFFICER: That's an inside joke.

2 MR. FLETCHER: Yeah, it is.

3

4 CROSS-EXAMINATION

5 QUESTIONS BY MR. FLETCHER:

6 Q. Hey, Tony. This is Kent Fletcher. How are
7 you?

8 A. Good, thank you.

9 Q. That water that's coming in below Heise flows
10 into the storage system as well as used for natural
11 flow; isn't that correct?

12 A. Yes.

13 Q. And that storage system doesn't only benefit
14 the Surface Water Coalition, does it?

15 A. No, it benefits many.

16 Q. Now, the storage -- the Surface Water
17 Coalition's source of water is not only storage water;
18 correct?

19 A. Correct.

20 Q. It includes natural flow?

21 A. Yes.

22 Q. What did you observe prior to -- well, at the
23 end of last irrigation season, what did you observe in
24 the storage system concerning the amount of storage?

25 A. It was below average. We finished the

1 irrigation season with less water in the -- remaining in
2 the reservoirs than what's typical.

3 Q. And what did you observe this winter before
4 runoff started on the inflows into the reservoirs?

5 A. Well, before the snowmelt started, it was
6 below average, and then, of course, when the snow
7 started melting, we've been above average since that
8 time.

9 Q. So before the snowmelt started, the flows
10 coming into the river were below average?

11 A. Yes.

12 Q. You had mentioned that -- I think you were
13 asked a very generic question about do members of the
14 Surface Water Coalition generally participate in renting
15 storage.

16 There are many members of the Surface Water
17 Coalition who do not regularly rent storage; isn't that
18 correct?

19 A. Yes, but the reason I answered the way I did
20 was the rental pool procedures have recently changed
21 where all participating space holders now are
22 responsible for supplying a portion of their storage
23 allocation, if needed, by the common pool.

24 Q. I see.

25 And so you were talking about flow

1 augmentation water?

2 A. Yes.

3 Q. But as far as actually renting water to a
4 third party, most of the Surface Water Coalition members
5 do not rent water to third parties; isn't that correct?

6 A. Well, under the most recent procedures, we
7 have the small pool which is 5,000 acre-feet maximum,
8 very small amount, but under the current procedures, the
9 participants, including the Surface Water Coalition,
10 could provide a small percentage to their storage
11 allocation towards that small rental.

12 Q. Yeah, that comes out of everybody's storage
13 accounts; correct?

14 A. Yes.

15 Q. But I'm talking about private leases. I
16 should have said it better.

17 Most of these do not -- most of the Surface
18 Water Coalition members do not have private leases; is
19 that correct?

20 A. Yes. I think the -- yes, I think that is
21 correct.

22 Q. And the storage you're talking about as far as
23 flow augmentation, that is a result of the Nez Perce
24 agreement?

25 A. Yes.

1 Q. And that is to protect the water users from
2 claims of the tribes; is that correct?

3 A. Yes.

4 Q. The futile-call scenario that you were talking
5 about on the Teton Basin, that was purely a surface
6 water system; correct?

7 A. Yes.

8 Q. And so when you talk about curtailing
9 in-season, you're only dealing with water that would
10 accrue that season; correct? You're not dealing with
11 what would happen from curtailment into future years?

12 A. I don't understand the question, but...

13 Q. I don't either, so let me -- in fact, let me
14 just withdraw that question.

15 I guess the point is that that is a
16 100 percent surface-water scenario you're talking about?

17 A. Yes.

18 Q. And that's true throughout the state, as far
19 as you know, isn't it; that if a senior cannot get his
20 water for whatever reason, he doesn't have a right to
21 call out a junior. Correct?

22 A. Yes. I think they have the same type of
23 practice in the Big Lost Basin and probably in some
24 other basins around Idaho.

25 Q. But those calls are not typically made under

1 the conjunctive management rules, are they?

2 A. No.

3 MR. FLETCHER: That's all the questions I
4 have. Thank you.

5 HEARING OFFICER: Redirect, Mr. Harris?

6 MR. HARRIS: I do.

7 MR. FLETCHER: I think Candice has a few.

8 MS. McHUGH: Can I just -- it's not really
9 redirect, I wanted to clarify something.

10 Now that Kent asked about recent rentals from
11 this common pool and the small pool, I just wanted to
12 clarify a few things, and then he can redirect. We
13 listed Tony as a witness, but I guess I would cross him
14 on what --

15 At this point is he your witness? I'm not
16 really sure how that works. I just want to ask a couple
17 clarifying questions, and I'm asking if I can do that.

18 HEARING OFFICER: What do the parties want me
19 to do?

20 MR. BUDGE: Well, it's Rob's witness and mine,
21 so anyone else would be crossing, so this would be the
22 time if Ms. McHugh wants to ask questions for
23 cross-examination.

24 MR. FLETCHER: Yeah. I don't think we have a
25 problem with that as long as if she opens up something

1 new, I guess we would have the right to address it.

2 HEARING OFFICER: Well, I have a hard time
3 characterizing these questions as cross-examination, at
4 least technically, but okay.

5 Ask your questions.

6
7 CROSS-EXAMINATION

8 QUESTIONS BY MS. MCHUGH:

9 Q. Good afternoon, Tony. It's Candice McHugh on
10 behalf of the Coalition of Cities and McCain Foods
11 specifically.

12 I wanted to ask a question -- just a
13 clarifying question about a statement you made relative
14 to an answer -- I think it was given by -- or in
15 response to an answer by TJ and then Mr. Fletcher
16 expanded upon it. It had to do with the storage
17 assignment for mitigation purposes.

18 Do you recall testimony relative to how
19 storage is assigned for mitigation purposes?

20 A. No. The way you're characterizing that, I'm
21 not sure I recall what specific question you're asking
22 me about.

23 Q. Fair enough.

24 You said recently that there were some changes
25 made on how water is provided to the small rental pool.

1 Do you remember that line of questioning of
2 Mr. Fletcher?

3 A. Yes.

4 Q. Okay. And can you explain what those changes
5 were?

6 A. Yes. Prior to the last couple years, we've
7 used what we call "late season fill" to supply common
8 pool rentals which can be comprised of the
9 5,000 acre-feet or flow augmentation rentals. What that
10 resulted in was some space holders had to provide a
11 higher percentage of their storage allocations towards
12 those rentals than others. And so in the last year or
13 two, we changed the rental pool procedures to spread
14 that obligation out to the small rentals and towards
15 flow augmentation to all participating space holders, so
16 each of those participating space holders supplies the
17 same percentage of their storage allocation towards
18 those rentals.

19 Q. And if a person went to this small pool, my
20 understanding is they're -- and wanted to rent water
21 from the small pool for mitigation purposes, is there
22 some new rule or is there some procedure that they would
23 have to follow to do that?

24 A. Yeah, I think the -- this past year, we
25 specifically excluded using the small pool, the

1 5,000 acre-feet supply, for mitigation purposes. The
2 purpose of the 5,000 acre-feet was to supply to small
3 diversions along the river that would reduce regulation
4 costs incurred by the watermaster.

5 Q. And members of the Surface Water Coalition, if
6 they were going to receive water from the storage
7 system, would they have to agree to accept that
8 mitigation water, or is there a limitation on their
9 ability to accept that mitigation water?

10 A. No, I don't think so. If someone purchased
11 some rental water, for example, and said, "I want to
12 supply that to Twin Falls Canal," I would add that to
13 the Twin Falls storage allocation whether they wanted to
14 use it or not.

15 Q. Okay. So I think I might have misheard
16 earlier. I thought you had said something about they
17 could opt out of having a storage assignment for
18 mitigation purposes. Is that just not correct?

19 A. No. The opt out part is an option for all
20 space holders to not participate in the rental pool
21 process. And by doing that, they don't have to
22 contribute any of their storage allocation towards these
23 common pool rentals.

24 MS. MCHUGH: Okay. That's all I wanted to
25 ask. Thank you.

1 HEARING OFFICER: Redirect, Mr. Harris?

2
3 REDIRECT EXAMINATION

4 QUESTIONS BY MR. HARRIS:

5 Q. Tony, just a couple follow-up questions:
6 Mr. Thompson emailed you the 2011 annual report from
7 Water District 1 or select portions of it.

8 Do you recall that testimony?

9 A. Yes.

10 Q. As a general matter, what was the 2011 water
11 year like?

12 A. I don't remember.

13 Q. Was it an above average water year or below
14 average?

15 A. I don't remember. I don't think it was below
16 average because those always stick in my mind, but
17 whether it was average or above average, I don't
18 remember.

19 Q. And the canals that are in the select portions
20 here, don't those systems have return or tail-out
21 locations that put water back in the Snake River or
22 other natural streams?

23 A. Yes, I think many of them do.

24 Q. But the Twin Falls Canal Company and North
25 Side Canal Company tailwater would come in below Milner

1 Dam; correct?

2 A. Correct.

3 MR. HARRIS: I have no further questions.

4 HEARING OFFICER: Okay. Mr. Budge, further
5 questions?

6 MR. BUDGE: You know how much I like to get
7 the last word in.

8 HEARING OFFICER: Okay.

9 MR. BUDGE: But I'm going to pass, so we're
10 done.

11 HEARING OFFICER: Recross?

12 MR. FLETCHER: I just have a few minor
13 questions since Ms. McHugh wanted to open up the nuances
14 of the common pool and the rental pool rules, so I guess
15 we'll talk about what those restrictions are on that.

16 HEARING OFFICER: Well, as Mr. Fletcher comes
17 forward, I hope that we don't get into the rental pool
18 procedures, because just an elementary acquaintance with
19 the rental pool procedures might take the next six
20 months.

21 MR. FLETCHER: Yeah, I'm -- I just want to
22 point out three issues and see if Mr. Olenichak agrees.

23 ///

24 ///

25 ///

1 Milner, then; correct?

2 A. Yes.

3 Q. And the most you can rent out of the common
4 pool is 100 acre-feet; correct?

5 A. Correct.

6 Q. And isn't there a limitation in the rental
7 pools that it cannot be used for mitigation?

8 A. Yes. I think there was a clause added during
9 this past year for groundwater recharge or mitigation.

10 MR. FLETCHER: Thank you.

11 HEARING OFFICER: Any more recross?

12 All right. Thank you, Tony, for hanging in
13 there.

14 Okay. I guess we're done for the day. We'll
15 start at 9:00 a.m. in the morning again.

16 I would like to ask before convening tomorrow,
17 Andrea, if you can work with Sarah Tschohl and maybe
18 with Pete, maybe we can get a list of all the exhibits
19 that have been admitted into evidence. Is that possible
20 to distribute to the parties?

21 And then I think that would be helpful for
22 everybody to look through and determine whether there
23 are exhibits that the parties wish to offer prior to our
24 adjournment and, all of a sudden, an attempt to try to
25 identify what exhibits are in or out.

1 Would that be helpful to everybody?

2 Sarah?

3 MS. KLAHN: Are you going to want closing
4 briefs or proposed orders?

5 HEARING OFFICER: I thought I would allow some
6 opportunity for a short period of time, if people want
7 to offer something in writing. I don't want to hear
8 oral argument, however.

9 MS. KLAHN: Right. That's what I was
10 wondering, if you wanted something in writing. Okay.

11 HEARING OFFICER: Yeah.

12 Okay. We'll see everybody at 9:00 in the
13 morning.

14

15 (Hearing adjourned at 5:21 p.m.)

16

17

18

19

20

21

22

23

24

25

REPORTER'S CERTIFICATE

I, ANDREA L. CHECK, CSR No. 748, Certified Shorthand Reporter, certify;

That the foregoing proceedings were taken before me at the time and place therein set forth, at which time the witness was put under oath;

That the testimony and all objections made were recorded stenographically by me and transcribed by me or under my direction;

That the foregoing is a true and correct record of all testimony given, to the best of my ability;

I further certify that I am not a relative or employee of any attorney or party, nor am I financially interested in the action.

IN WITNESS WHEREOF, I set my hand and seal this 19th day of June, 2023.

Andrea Check

ANDREA L. CHECK, CSR No. 748, RPR, CRR

Notary Public

P.O. Box 2636

Boise, Idaho 83701-2636

My Commission expires July 20, 2028.

§	73:5;75:21;95:4;215:6,7; 219:11;220:6,8	125:19;126:4;127:11,13; 130:10,17;134:1;143:12; 147:2,9,25;148:2,15;164:1,2, 6,7;165:3,4,8,9,15;178:9,11; 197:23;213:7,14;221:16,20; 235:12,16,16;247:15,17; 250:12;255:7;259:9;260:1,2; 263:4,17,24;264:4	21:9;46:23;49:25;58:20; 59:7;63:3;70:2;83:1;86:21; 94:13;133:21;177:8;178:21; 179:6;180:1;181:4,8,14; 189:3;196:21;205:22;209:7; 231:16;241:7;251:24;255:3
\$100 (2) 133:21;134:1	accomplish (1) 15:3 accomplished (1) 91:15	accomplish (1) 15:3 accomplished (1) 91:15	ad (1) 186:16
/	according (2) 229:10;241:14	according (2) 229:10;241:14	add (8) 27:21;47:22,23;161:25; 178:19;179:1;182:16;260:12
/// (8) 10:25;149:24,25;243:24, 25;262:23,24,25	account (13) 28:10;37:10;42:20;53:1; 61:12;62:14;63:15;109:1; 113:24;117:19;179:14; 183:4;231:7	acre-foot (13) 43:10;131:10;133:21; 134:2;163:20,24;197:22; 221:21;247:21;249:25; 251:21,25;263:7	added (2) 164:22;264:8
[accounted (5) 44:6,10;61:22;121:5;197:5	acre-foot-per-acre (1) 250:16	adding (2) 59:17;86:13
[As (2) 55:4;103:24 [sic] (2) 34:9;183:12 [Unintelligible] (1) 242:18 [Witness (1) 144:18	accounting (1) 247:1 accounts (1) 255:13 accrual (4) 164:3;165:4,9;225:12 accruals (7) 165:11;171:1;186:17,22; 192:12;214:21;225:15	acre-foot-per-acre-diverted (1) 250:9 acres (154) 15:5;16:10;17:16,18,24; 18:1,9,11,12,15,18;19:3,11; 20:11,20;21:5;25:7,9,13; 26:17,24;27:2,5,6,20,21; 28:8,11,17;29:1,3,12,13,18, 21,22;30:4,7,11,15,17;31:5, 8,12,21,24;33:3,15,20,23,24, 24;36:4,5,8;56:14;57:5,13; 58:1,2,4,6,8,12,14;62:12,13; 64:18,20,21,25;65:1;86:12, 15,23;87:2;88:11,17,20;93:9, 18,23;94:22;95:4,6,12,14,15; 96:6,13;112:12,14,18,20; 113:11,14,20,24;114:4,9,20; 117:22;118:4,9,11,12,13,15, 19;119:2,4;125:5,7,8,9; 131:1;133:1,2;163:6,7; 164:1;172:11;178:16,23; 179:4,7;183:15;185:16; 194:13,17;195:17;200:9; 209:1,5,13,20;210:4;222:2; 247:19,23;248:1,4,6,11,15; 250:2,2,9,11,14;251:17,19, 21,23	addition (5) 42:20;43:21;52:12;57:19; 229:20 additional (11) 94:17;103:10;120:5; 127:13;155:4;158:21; 172:22;185:2;189:23; 199:22;200:5 additionally (1) 61:24 address (20) 11:8,10;15:13;16:21;22:2; 24:21;42:10;60:1;69:15; 103:9;122:17;154:13;157:1, 24;175:14;179:14;187:19; 245:14;251:8;258:1
A	accrue (3) 178:22;179:2;256:10	across (8) 35:3;43:25;74:17;77:17; 107:2;178:22;182:22;232:4	addresses (1) 80:24
A&B (6) 89:24;127:5,7;140:9; 211:8;244:3	accrue (2) 237:15;242:7	Act (1) 131:21	addressing (1) 189:14
ABA1 (1) 51:15	accumulation (1) 41:13	action (2) 133:15;176:6	adequate (6) 37:5;97:11;100:15,20; 189:22;198:25
abandon (2) 222:8,14	accuracy (5) 49:8;172:14,18;173:13; 206:7	actions (4) 91:23;132:14;134:7,15	adjacent (2) 202:18;219:25
Aberdeen-American (1) 123:14	accurate (4) 58:14;164:10;251:16,22	actively (1) 183:19	adjourned (1) 265:15
ability (14) 171:9,23;175:15;188:12, 13,15,16,25;192:24;193:1; 199:17;200:13;245:7;260:9	accurately (2) 108:3;189:1	activities (4) 12:13,14;73:22;101:25	adjournment (1) 264:24
able (30) 14:24;27:15;36:17;47:21; 60:3;68:25;70:9;77:16,25; 84:2;127:18;131:6;148:19; 157:15;167:23;170:5;177:4; 179:22;184:14,19;185:5; 189:3,24;190:6;193:3,11,15; 195:23;204:8,19	achieve (3) 147:6;168:1;189:3 achieved (3) 187:5;203:16;204:3	actual (16) 31:2,3;57:13;73:5;79:2; 155:23,24;156:10;179:11; 207:17;209:10;219:5; 247:23;248:1,14;251:18	adjudicated (1) 135:25 adjudication (6) 151:9,16,17,23;194:21; 195:10 adjust (13) 67:5,9,12;68:7;77:4;78:7; 80:11;83:12;84:2;114:6,21; 192:24,24 adjusted (2) 72:8;113:23
above (33) 17:22;24:23;38:16;56:12; 73:4;96:22;97:10;104:4; 144:19,21,21,24;201:24; 218:10,19,21;229:20; 231:25;232:10,14,17,17; 233:6,17;234:5,14,16; 241:19;252:5;254:7;261:13, 17;263:25	acknowledge (1) 181:3 acknowledging (2) 219:16,17 acquaintance (1) 262:18 acquire (1) 189:22 acre (19) 20:18;30:18;57:4;178:3,5, 6,7,13,17;179:6;181:10,11; 185:11;213:7;247:16,17,21; 251:22,25 acreage (7) 16:8;20:15,25;27:16; 113:7;198:17;199:7	actually (26)	administration (10)
above-average (5) 41:15;61:5;97:19;98:6; 233:22	accept (5) 20:20;81:7;146:4;260:7,9		
acceptable (2) 215:4;221:1	accepted (8)		

<p>53:1,5;109:2;168:24; 169:9;170:12;215:19,23; 216:1,6 administration's (1) 110:14 administrative (6) 168:21;188:16;206:7; 219:5;231:17;236:10 admission (4) 186:1;187:1;206:19; 236:13 admit (6) 87:7;148:25;206:17; 236:9;252:10,13 admitted (3) 129:19;149:4;264:19 adopted (3) 81:8;97:3;224:1 advance (1) 176:23 advanced (1) 63:23 advantage (1) 233:24 advisory (3) 13:8,10;65:13 advocating (2) 109:3;222:7 aerial (6) 27:6;33:14,20;96:3; 199:16;208:14 affect (5) 112:21;188:23;198:1,14; 224:10 affected (1) 235:22 affecting (1) 101:2 affects (3) 84:23;85:10;113:5 AFRD2 (2) 54:12;61:20 afternoon (7) 112:6;140:8;150:12; 207:7;211:7;237:5;258:9 again (44) 16:16,25;17:9;22:5;28:18, 20;35:5;40:4;46:5;53:17; 57:17;59:12;74:17;76:8,15; 81:14;84:11,13,20;86:10,23; 98:18;111:16;116:9;118:18; 120:6;134:21;135:5;138:10; 140:9;141:21;160:25; 166:13;174:18;176:11; 177:17;186:15;199:17; 215:6;217:20;250:6;251:7,9; 264:15 against (7) 37:8;43:14;57:10;95:2,3; 97:13;133:15 agnostic (1) 196:19 ago (2)</p>	<p>110:9;214:18 agree (29) 50:14;91:2;93:16;95:8; 96:5;101:8;103:12;108:12, 15;116:19;161:2,4,9;176:20; 181:19;186:21,24;201:18; 202:4,5;210:17;216:5,9,13, 24;217:3,13;224:9;260:7 agreed (2) 25:8;219:15 agreement (31) 61:25;131:5;134:9;135:4, 8,17,19,23,24;136:11;137:1; 138:15;145:19,23;146:19, 25;147:4,7,12,14,17;148:1,2, 19,20;223:17;237:24;238:4, 8;245:3;255:24 agreements (1) 12:16 agrees (1) 262:22 agricultural (2) 95:22;151:2 Agriculture (1) 199:15 ah (1) 204:12 ahead (4) 24:15;78:20;146:16; 164:20 aid (2) 134:23;168:20 al (4) 89:25;140:9;211:8;244:4 alarming (2) 191:14,25 alfalfa (1) 125:12 alignment (1) 156:24 allocated (3) 148:2,7;229:15 allocates (1) 229:14 allocation (15) 44:10;52:25;133:16; 143:8;147:22,22;148:13,14; 235:1;236:3;254:23;255:11; 259:17;260:13,22 allocations (3) 37:25;243:13;259:11 allotted (1) 126:8 allow (7) 68:6;106:15;189:22; 202:14;208:2;248:25;265:5 allowable (1) 180:21 allowed (7) 42:2;67:5,9,12;77:4; 126:11;234:19 allows (4) 106:25;202:6,8;234:6</p>	<p>alluvial (2) 105:21,23 almost (6) 42:18;47:1;86:16;88:18; 142:2;204:16 along (3) 193:21;242:2;260:3 alternative (3) 22:25;35:1;82:13 Although (1) 168:21 always (3) 62:8;108:12;261:16 Amalgamated (1) 124:24 Amended (4) 39:13;60:16,16;158:15 American (8) 51:25;71:5;102:2;104:18, 23;105:2;112:7;235:11 among (6) 127:24;145:17,24;147:13, 22;237:11 amongst (1) 217:17 amount (26) 68:20;77:17;78:1;85:21; 113:24;115:10,14;116:21; 125:25;126:3,12;127:17; 139:7;143:9;234:1,11; 235:15,16;237:14;241:9; 246:24;247:19,23;248:14; 253:24;255:8 amounts (4) 39:10;41:21;229:15;247:6 analyses (8) 48:1;73:17;191:7;193:15; 205:18,21;208:4;213:1 analysis (62) 14:22;15:5,21,24;16:3; 22:2,11,12,19,21;23:8;27:9; 30:15;31:2;35:15;42:12; 46:8,12;48:1;53:22;54:21; 55:13,22;57:18;60:3;73:14; 75:13;79:18;85:1,3;88:22; 115:1;128:9;130:1,4;139:6; 143:13,14,23;158:14,18,20; 160:5,5;163:6;165:7;179:24; 184:19;185:2;192:9;196:8; 200:16;205:3;219:23,24; 220:3,4;221:4;225:4,6; 226:12;227:10 analyze (3) 15:9;74:23;208:10 analyzing (1) 116:12 Anders (9) 21:14;31:7;50:10;51:2; 60:18;63:17;172:25;197:1,3 Anders' (2) 197:18;198:16 Andrea (3) 9:5;89:17;264:17</p>	<p>anisotropy (1) 106:1 annual (8) 39:1;77:11;131:16; 136:24;246:9,15;247:23; 261:6 annually (2) 223:2;244:14 answered (3) 156:5;252:2;254:19 anthology (2) 170:7,9 ANTHONY (2) 7:4;228:8 anticipate (4) 121:15;128:18,24;185:1 anticipated (1) 158:9 anticipating (2) 129:9;142:8 anymore (1) 83:13 anyways (1) 9:9 apologize (1) 184:12 Apparently (1) 195:21 appeal (1) 135:11 appears (6) 116:4;165:13;167:17; 190:6;192:23;220:14 application (11) 79:12;109:14;110:3,9; 118:11;128:1;148:6;154:13; 215:9;238:18,24 applications (2) 109:2,9 applied (10) 18:1;47:10;52:18;103:17; 110:21,22;165:15;167:18; 178:7;203:15 applies (2) 69:23;179:9 apply (6) 31:2;35:17;36:4;79:1; 184:3;200:14 applying (2) 21:6;36:3 apportion (1) 147:8 apportioned (2) 145:17,24 apportioning (1) 226:3 apportionment (1) 147:12 appreciate (1) 120:21 approach (8) 48:12;52:13;103:13,15; 166:4;169:25;188:2;203:21</p>
--	---	---	--

<p>approaches (1) 16:2</p> <p>appropriate (16) 39:2,6,21;105:16;138:2; 167:13,15,19;169:5,18; 170:4;177:21;203:14,16; 204:3;224:7</p> <p>appropriateness (1) 169:25</p> <p>Appropriators (3) 122:22;213:4;223:17</p> <p>Approval (1) 142:17</p> <p>approved (5) 215:11;216:10;227:6,9,14</p> <p>approximately (10) 30:17;64:21;90:13;125:5; 185:15;192:14;196:21; 197:23;235:8,11</p> <p>approximates (1) 56:7</p> <p>April (27) 13:16;37:3;46:9;55:19; 56:7;57:20;58:19,21,23,24, 24;85:8;88:23;101:15; 102:20;127:22;128:14; 230:6;231:18;233:4,12,16; 234:15;244:15,18,23,25</p> <p>aquatards (1) 70:3</p> <p>Aquifer (56) 12:2,5;13:4;44:1;49:25; 50:5;51:23;52:2;66:6,21; 67:10,11;68:3,5;70:2,3,4,21; 71:3,21,23;72:5,6;74:12; 76:4;78:5;80:13;82:17,18; 84:3,5,21;88:10;91:4,15; 105:21;107:1,25;131:23; 142:9;159:7;163:2;172:8,10; 179:19;180:1;189:8;202:7,9, 17;214:22,25,25;217:5; 220:7;224:23</p> <p>aquifers (1) 71:10</p> <p>aquifer's (1) 78:11</p> <p>Aquifer-System (1) 106:8</p> <p>archive (1) 94:17</p> <p>archived (1) 34:10</p> <p>area (36) 32:24;69:6,23,25;70:23; 72:4;79:2,3,3;95:20;101:22; 105:2,14;106:17,18;107:11; 114:25;124:16;131:23; 140:19;151:13;185:12; 209:24;210:20;229:17; 240:7,8,13,16,25;247:25; 250:1,1,7;251:16,21</p> <p>areas (12) 70:25;79:8;112:8;140:19,</p>	<p>20;180:20;200:14,15;202:1; 234:5,15;250:7</p> <p>arguably (1) 41:21</p> <p>argument (1) 265:8</p> <p>arguments (2) 154:6;161:1</p> <p>argument's (1) 156:8</p> <p>arise (1) 204:4</p> <p>arisen (2) 135:2,7</p> <p>arises (2) 230:18;234:5</p> <p>Army (1) 230:8</p> <p>around (34) 12:3,13,16;15:5;17:13; 25:12;27:5,11;28:24;30:2; 34:6;40:23;43:11;51:20; 53:23;54:22;67:21,25;68:4, 8;69:1;71:20;73:15;79:2,18; 81:15;90:13;96:15;100:8; 108:16;132:24;180:11; 194:25;256:24</p> <p>around205 (1) 80:16</p> <p>arrival (1) 165:10</p> <p>arrive (3) 39:7;196:17,22</p> <p>arrives (1) 196:14</p> <p>articulate (1) 188:12</p> <p>As-Applied (22) 13:16;14:23;15:6,17;19:8, 9;65:7;85:8;88:22;101:15; 128:15;137:24;154:20; 166:16,21,24;168:10,11; 187:16,22;203:24;235:13</p> <p>ascertain (1) 203:15</p> <p>Ashton (1) 218:18</p> <p>aside (1) 27:1</p> <p>aspect (1) 207:8</p> <p>aspects (1) 71:18</p> <p>assembled (2) 170:6,10</p> <p>assertion (1) 197:3</p> <p>assess (2) 194:24;195:2</p> <p>assessing (4) 15:17;160:1,3;194:18</p> <p>assign (4) 33:12;67:4;166:17;167:1</p>	<p>assigned (4) 157:25;194:21;218:11; 258:19</p> <p>assigning (1) 158:2</p> <p>assignment (5) 159:2;245:11,20;258:17; 260:17</p> <p>associate (2) 33:3;150:25</p> <p>associated (4) 29:18;31:23;56:3;102:13</p> <p>Associates (1) 152:7</p> <p>assume (3) 121:11;145:8;227:18</p> <p>assumed (1) 147:23</p> <p>assumes (1) 163:6</p> <p>assumption (1) 250:11</p> <p>attached (1) 26:9</p> <p>attachment (2) 21:10;24:2</p> <p>attainable (1) 174:24</p> <p>attempt (2) 136:22;264:24</p> <p>attempting (2) 91:22;136:10</p> <p>attention (3) 53:21;104:12;244:22</p> <p>attorney (1) 169:4</p> <p>attorneys (1) 89:24</p> <p>audio (1) 47:3</p> <p>augmentation (11) 238:3,7;244:11;255:1,23; 259:9,15;263:7,9,10,13</p> <p>authored (1) 214:9</p> <p>authorized (2) 209:5,8</p> <p>automated (1) 67:1</p> <p>availability (1) 224:10</p> <p>available (47) 14:19;27:8;31:20;32:3,5, 17;34:2,13;35:25;36:10,12, 19;53:2;63:16;90:24;91:1,3; 95:9;106:6;115:6;118:3; 130:3;157:1;170:23;171:5, 22,23;172:17;175:3,5,9,13; 180:22;182:15;183:4; 190:22;191:10;192:13; 198:4;200:12;205:18; 222:24;223:5,8;244:11; 263:5,14</p>	<p>average (45) 38:13,17;39:7,10,17,22,24; 41:3,5;42:5,16;44:19,22,23; 45:10,12,14,16,20;53:16,18; 61:5;74:17;96:22;97:5,8,10; 125:18;126:6;128:22; 144:19,21,22,23;178:22; 233:5;253:25;254:6,7,10; 261:13,14,16,17,17</p> <p>averages (1) 37:20</p> <p>averaging (2) 42:2;133:22</p> <p>avoid (1) 53:4</p> <p>aware (7) 126:14;127:24;128:3,14; 172:18;212:20;238:1</p> <p>away (3) 44:19;80:18;225:2</p>
B			
			<p>bachelor's (2) 11:17;151:1</p> <p>Back (23) 16:24;24:18;28:8,14;35:6; 47:3;64:8,10;65:3;89:16; 106:9;111:11,13;113:10; 121:25;141:18;155:7; 164:11;192:22;193:25; 224:15;242:23;261:21</p> <p>background (7) 11:16;32:16;65:6,10;85:7; 150:24;228:23</p> <p>balance (5) 37:4,5;41:23;43:13;57:9</p> <p>balanced (1) 42:25</p> <p>bar (4) 83:10,10;190:25;191:17</p> <p>Barlogi (3) 132:18;194:8,10</p> <p>barred (1) 184:18</p> <p>bars (1) 191:22</p> <p>base (1) 96:20</p> <p>based (47) 28:4;34:9,11;35:22,24; 38:24;40:8,8;41:20;42:22; 45:8;51:9;55:12;57:23; 59:22;61:24;63:3;66:17; 67:5;69:21;70:11;72:5;74:1; 94:15;96:15;98:12;104:14; 105:8;109:10;110:4;113:7; 116:12;127:16;128:10; 129:25;130:3,15;147:9; 148:12,15;165:2;174:8; 207:21;227:18;233:4;248:7; 250:10</p> <p>baseline (77)</p>

<p>23:4;36:24;37:1,9,16; 38:12,15,19,22;39:2,7,14,16, 18,20,21,23,24,25;40:4,6,10, 16,23;41:1,12,13;42:3,12,15; 44:11,13,14,21,22,24;45:7, 15,17;53:14,23;54:8,8,55:15, 16,17,19,22;56:8;57:7,8,22; 58:25;59:1,18,25;61:2,16; 62:7,8,21,25;88:3,7,20; 96:19,21,23;97:2,6,10;98:3, 4;99:17;101:1,4;147:10</p> <p>baseline-year (1) 62:24</p> <p>basic (1) 73:17</p> <p>basically (68) 17:18;18:24;20:20;21:22; 22:2;23:1;25:16;26:25; 28:10;31:2;32:7,9,25;33:2, 14,17;34:25;37:10;42:5; 43:10;44:18;46:11;47:19; 48:7,14,18;49:3,7;50:4; 52:16,25;53:10;56:1,5,10,20, 22,24;57:25;58:8;59:8; 60:10;61:19;66:3,12,16,22; 67:3,20;68:13;70:20;71:2,4, 9,25;72:18;73:11;77:1;79:1; 81:7;82:7,12;85:18,23; 86:11;104:25;105:6;173:17</p> <p>Basin (27) 144:20;151:17,22;195:10; 213:8;232:4,12,14,19; 233:23;234:18;237:21; 238:19,21,25;239:3,4,5,6,9, 10,20;240:7,12;242:3;256:5, 23</p> <p>Basins (6) 229:25;232:3,6,6,9;256:24</p> <p>basis (18) 35:18;81:24;93:12; 125:17;163:21,24;173:19; 174:6;191:14;194:15; 195:16,16;205:19;219:6; 223:5,8;226:11;251:1</p> <p>Bates-stamped (1) 218:8</p> <p>Baxter (3) 9:20,21,23</p> <p>beans (1) 125:13</p> <p>bearing (1) 190:9</p> <p>become (1) 207:22</p> <p>becomes (1) 240:18</p> <p>beets (1) 125:13</p> <p>began (1) 160:21</p> <p>begin (1) 122:17</p> <p>beginning (2)</p>	<p>50:22;119:21</p> <p>behalf (7) 10:4;90:19;92:12;122:21; 132:13;153:9;258:10</p> <p>behind (1) 129:13</p> <p>belabor (2) 161:19;186:16</p> <p>belief (2) 137:6;205:2</p> <p>believes (2) 136:2;181:17</p> <p>belong (1) 125:1</p> <p>belonged (1) 125:25</p> <p>below (16) 38:17;53:18;102:2,9; 103:7;218:20;232:19,23; 233:2;253:9,25;254:6,10; 261:13,15,25</p> <p>below-average (1) 97:19</p> <p>beneficial (8) 130:10;178:2,16,17;179:7; 181:14;185:17;197:23</p> <p>benefit (9) 56:6;86:2,16;130:16; 177:25;179:2;197:15;221:7; 253:13</p> <p>benefits (2) 102:8;253:15</p> <p>best (28) 66:11,17,24;69:3;90:23; 91:1,2,14;95:8;96:15; 169:18,21;170:23;171:4,22, 23;175:3,4,9,13;190:22; 191:9;192:13;200:11; 202:15;217:19;218:25;219:1</p> <p>bet (1) 141:6</p> <p>better (18) 17:4;50:24;77:5;108:21; 140:25;141:11;176:19,20; 193:13;216:24;217:21; 219:18;220:6,9,10,12,15; 255:16</p> <p>beyond (5) 109:12;127:12;134:12; 187:9;248:22</p> <p>bias (16) 40:16;42:17;55:3;58:19; 59:4,17,24;60:11;61:8;62:6, 12,21;100:23,24;101:5; 103:17</p> <p>Big (4) 13:10;125:12;235:24; 256:23</p> <p>bigger (1) 124:24</p> <p>binder (1) 16:18</p> <p>binders (1)</p>	<p>129:13</p> <p>Bingham (1) 123:15</p> <p>biological (1) 229:1</p> <p>bit (12) 43:20;61:9;65:21;66:7; 78:16;141:21,22;153:16; 180:10;198:4;199:11;247:8</p> <p>Black- (1) 106:17</p> <p>Blackfoot (51) 50:3,21;56:6;67:23;68:14, 23;69:13;70:6,14;71:3;72:4; 75:19;76:13;84:24;85:11; 86:3,17;91:7,16,17,24;104:1; 105:5;106:17;107:9,16; 108:22;119:24;171:1,2,12; 173:15;190:24;201:20; 216:25;217:3,19;218:15,20, 21,25;220:11;229:20,21,25; 232:15,24;233:7,14;234:5,13</p> <p>Blaine (1) 124:14</p> <p>block (1) 221:17</p> <p>blocks (1) 199:13</p> <p>blue (4) 77:13,21;83:7,10</p> <p>Board (4) 102:11;142:13;151:8,8</p> <p>Board's (2) 101:25;102:4</p> <p>body (1) 28:14</p> <p>Boise (1) 242:15</p> <p>bold (2) 46:22;48:16</p> <p>Bonneville-Jefferson (7) 150:2,14;152:9;153:5; 211:10,20;213:3</p> <p>book (1) 217:25</p> <p>books (1) 247:23</p> <p>both (18) 20:5;52:20;84:2;91:11; 119:4;152:18;156:2;167:9; 168:11,13,14,20;175:15; 188:15;202:18;221:8;226:2; 229:5</p> <p>bottom (8) 22:6;33:22;86:5,13;130:7; 176:19;202:18;218:8</p> <p>Boulder (1) 11:13</p> <p>boundary (6) 33:1;35:12;66:10;107:12; 209:12,12</p> <p>box (20) 32:22;49:17,18,20,22,23;</p>	<p>50:2,13,16;51:3;101:14; 102:12,14,16,18;103:1,2,12; 119:22;209:14</p> <p>breaches (1) 136:7</p> <p>Break (13) 16:23;64:5,7,9;89:15; 111:3,11,13,15;193:22,23, 25;194:1</p> <p>briefly (14) 12:25;32:13;35:21;36:25; 46:5;53:9;132:16;150:24; 158:23;173:3;177:15; 186:14;227:1;230:11</p> <p>briefs (1) 265:4</p> <p>bring (2) 106:12;137:2</p> <p>bringing (1) 83:23</p> <p>brings (2) 118:17;231:24</p> <p>broaden (1) 220:1</p> <p>broader (2) 174:17;202:21</p> <p>Broadly (3) 146:20;176:5,7</p> <p>broken (1) 85:14</p> <p>brought (6) 53:20;76:24;81:14; 104:12;138:24,25</p> <p>Bryce (12) 121:19;149:16;150:1,18, 20;176:10;188:3;194:7; 196:3,25;207:7;227:5</p> <p>B-r-y-c-e (1) 150:18</p> <p>Bryce's (1) 206:17</p> <p>Budge (43) 7:6;16:20;121:13,14,17, 20;122:11,14;129:16,20; 132:4;134:12,19,22,25; 135:6,10,13,16,21;136:7; 137:22;138:5;144:11,14; 146:4,13,17;148:21;149:8; 236:21,22;237:4,6;243:18, 20;245:2;250:23;251:2; 257:20;262:4,6,9</p> <p>budget (18) 67:12;68:2,6,8;74:5;76:20; 77:4;78:11;79:15;83:2,4,25; 84:3,5;108:1,17;159:4; 182:14</p> <p>budgets (2) 151:19;214:3</p> <p>buffer (4) 79:1,3,6,8</p> <p>build (8) 66:9,10;69:5,5;177:7; 203:3,3,3</p>
---	---	---	---

<p>built (7) 68:11,25;69:9,25;100:23; 105:19,20</p> <p>bullet's (1) 221:12</p> <p>burden (1) 156:3</p> <p>Bureau (5) 230:7;235:24;244:11,16; 263:10</p> <p>Burley (1) 19:18</p> <p>business (3) 11:8,10,12</p> <hr/> <p style="text-align: center;">C</p> <hr/> <p>calculate (15) 19:8;20:25;31:22;53:14; 58:13;74:7;108:4;119:2; 156:18;166:25;196:15,19; 198:8;203:6;204:14</p> <p>calculated (15) 42:19;60:5,21;94:21; 112:12;113:3;174:20;178:5; 179:10;183:24;197:8,12; 201:14;202:2;205:24</p> <p>calculating (4) 114:4;166:22;169:13; 198:8</p> <p>calculation (38) 17:20,25;18:18,19;19:11; 20:4,8,12,21;21:7;23:3; 27:24;28:1;30:9,12;31:10; 54:1;57:14,24;58:9;61:22; 96:13;112:22;113:6,16; 114:11,23;115:19;143:6; 187:7,8;193:2;196:18; 198:13,15;204:2;247:18; 250:17</p> <p>calculations (6) 18:2;19:1;168:14;197:21; 203:15;221:8</p> <p>calibrate (2) 69:1;77:25</p> <p>calibrated (8) 66:12,16,17;84:2;206:2,3; 216:21,24</p> <p>calibration (26) 31:19,24;66:8,23;67:2,10; 68:7;69:7;72:9;73:12,12; 74:10,25;77:2,2;78:9;79:25; 80:1,9,15;81:3;83:19;84:6; 108:24;217:9,14</p> <p>call (21) 11:3;68:17;90:2;101:19; 128:15;130:25;131:5; 150:19;159:5;172:3;211:19; 231:9;238:18,25;239:25; 240:17;241:13,13;248:25; 256:21;259:7</p> <p>called (15) 10:18;28:24;29:12;32:24;</p>	<p>65:4,13;66:18;67:2;70:3; 106:23;122:5;150:2;170:6; 228:9;248:18</p> <p>calls (6) 109:19,25;133:11;134:19; 251:2;256:25</p> <p>came (3) 29:5;129:1;199:14</p> <p>camp (1) 189:16</p> <p>can (199) 9:8,18,22,23;10:13;11:7; 15;13:3;16:8,20;17:3,9;18:3; 20:2,5,6,10,16;21:11,19; 24:23;25:25;26:21;27:20,21; 28:18;30:23,25;31:13;32:13, 20,24;33:1,3;34:5,22;35:12, 17,21;36:24;37:3;38:14,15, 18;41:15;42:13,21;43:20; 45:5,11;46:11,17,22;47:11, 23;48:24;49:20;51:14;52:18; 53:9;54:5,9,24;55:8;57:15; 58:18;60:22;61:18;63:5,23; 65:6,21;68:21;69:14;71:15; 72:22,24;75:10;76:7,21; 78:10;80:16,23,23;84:18; 86:7,13,23;87:6;88:9,15; 89:11;91:20;95:16;96:15; 98:17;104:8,15,22;106:1,20; 107:3;110:7;111:8,24,24; 112:25;113:15;114:7; 115:12;117:19;118:14; 120:15;123:5;127:8,12,15, 20;129:7;133:23;134:22; 136:1;137:17;149:21; 150:16;151:4;153:15,15; 154:2;155:7;156:19;157:19; 158:25;163:1,18,19;165:3, 17,21;170:12;173:7,18; 176:4,7,13,22;177:2,6,12,13, 15,17;179:17;180:2;182:16; 183:10;184:5,10;188:22; 189:11;190:13;191:12; 193:21,21;195:15;200:13, 20;204:7,18;206:7;208:4; 216:14;218:18;222:11; 223:1;228:19;231:10;236:2, 24;237:5,7;239:7;242:23; 243:10;244:5,6;246:14,22; 249:22;251:17;257:8,12,17; 259:4,8;263:22;264:3,17,18</p> <p>Canal (46) 19:22;20:15;27:19;30:16, 18;46:10;49:4;54:15,19; 56:19;58:4,7,14;60:15;62:3; 94:4;95:10;112:15;114:10; 127:6,14;132:22,23;140:22; 151:7,8,9;194:20;197:5; 209:23;210:15,19;213:7; 223:7;235:6,15,18;236:3; 247:11,19,20;250:8,14; 260:12;261:24,25</p> <p>canals (10)</p>	<p>213:11;234:2;247:2,6; 248:8;250:3,5;251:12;252:7; 261:19</p> <p>Candice (3) 9:11;257:7;258:9</p> <p>candidate (1) 174:10</p> <p>Canyon (20) 49:17,18,20,22,23;50:2,13, 16;51:3;101:14;102:12,14, 16,18;103:1,2,12;119:22; 240:10,15</p> <p>capabilities (1) 188:18</p> <p>capability (1) 36:1</p> <p>capable (6) 106:19;171:13;174:10; 179:24,24;205:20</p> <p>capture (2) 37:17;96:15</p> <p>captured (1) 157:14</p> <p>carburetor (2) 220:25;221:3</p> <p>care (3) 113:17;149:20;174:20</p> <p>career (1) 105:19</p> <p>careful (1) 99:3</p> <p>Carey (1) 123:13</p> <p>Carlquist (12) 121:21,22;122:4,19; 132:10;135:1;136:1;140:2; 146:3,12;149:13;178:14</p> <p>carried (1) 23:9</p> <p>carry (1) 100:16</p> <p>carryover (28) 15:8;53:8,10,11;54:1,3,17, 23,24;59:25;60:7,20,23; 99:17,18,22;100:2,2,8,12,18, 23,24;101:2;140:25;242:18; 243:2,7</p> <p>case (16) 12:11;13:12;14:5;75:16; 90:15,18;135:20;136:13; 137:23;167:9;196:20;202:1; 204:14;209:22;220:11; 250:13</p> <p>cases (2) 189:18;190:25</p> <p>casting (1) 50:19</p> <p>casual (3) 175:18;195:16,16</p> <p>catch (1) 195:15</p> <p>catches (1) 52:5</p>	<p>categories (1) 199:20</p> <p>category (1) 118:12</p> <p>cause (8) 10:19;122:6;150:4;183:22, 23;197:12;201:15;228:10</p> <p>caused (2) 68:1;116:17</p> <p>causes (4) 105:5;179:9;180:1;187:19</p> <p>cell (5) 76:10;202:16,17,18; 219:22</p> <p>cells (7) 20:11;76:12;202:19; 219:21,25;220:2,5</p> <p>certain (10) 67:4;107:1;140:19; 144:24;189:7;200:16;219:8; 230:15;241:9;251:23</p> <p>certainly (11) 36:1;141:10;157:22; 158:17;170:16;183:11; 184:23;185:5;189:16; 223:24;242:9</p> <p>certainty (1) 109:13</p> <p>cfs (1) 163:21</p> <p>chair (1) 122:8</p> <p>chairman (2) 124:7,9</p> <p>chance (3) 51:3;141:11;246:10</p> <p>change (39) 20:25;21:4;46:15;48:21; 53:19;54:8,11;72:10,25; 74:8,11;80:13,19;84:13; 94:3,24;99:18,22;103:3; 108:19;112:20;113:5,10; 114:3,18;128:8;130:22; 148:6;154:7;162:24;163:10; 164:25;194:16;195:12,17; 196:14;214:22;236:5;250:16</p> <p>changed (16) 27:16;74:4;80:7;95:7; 111:23;112:18;127:25; 147:17;160:9,11,17,18; 169:1;230:13;254:20;259:13</p> <p>changes (13) 22:13;50:4;53:25,25; 73:19,24;74:2;112:19; 120:25;127:24;220:7; 258:24;259:4</p> <p>changing (8) 21:5;74:17,18;76:17; 113:13,15;114:9,12</p> <p>channel (2) 239:24;240:4</p> <p>characteristic (1) 199:14</p>
---	--	--	--

<p>characteristics (4) 104:1;106:21;179:18; 189:8</p> <p>characterize (1) 96:12</p> <p>characterizing (2) 258:3,20</p> <p>charged (1) 127:12</p> <p>chart (3) 75:10,11;119:3</p> <p>charts (1) 191:8</p> <p>chastised (1) 214:18</p> <p>check (2) 74:23;150:19</p> <p>checked (1) 34:10</p> <p>cheese-processing (1) 124:23</p> <p>choose (1) 249:1</p> <p>choosing (6) 42:14;44:22;53:17;54:7; 59:17;78:25</p> <p>chopped (1) 249:19</p> <p>chose (7) 39:23;40:25;41:8,9,10; 79:9;80:25</p> <p>chosen (4) 41:2,4;45:22;103:16</p> <p>chug (1) 193:21</p> <p>CIR (1) 83:20</p> <p>circle (1) 220:1</p> <p>circumstances (2) 43:17;170:13</p> <p>citation (1) 162:25</p> <p>citations (1) 165:1</p> <p>cited (1) 155:11</p> <p>cities (2) 124:25;258:10</p> <p>City (4) 228:9;230:20;240:12,16</p> <p>claims (5) 151:10,23;194:22;195:9; 256:2</p> <p>clairvoyant (1) 228:6</p> <p>clarification (3) 134:16;185:10;240:6</p> <p>clarify (4) 34:5;117:18;257:9,12</p> <p>clarifying (2) 257:17;258:13</p> <p>clarity (1)</p>	<p>148:22</p> <p>Clark (2) 86:6;123:15</p> <p>classes (1) 33:18</p> <p>classification (2) 33:14;95:19</p> <p>classifications (1) 118:24</p> <p>classified (2) 33:17;95:20</p> <p>clause (1) 264:8</p> <p>cleanup (1) 64:17</p> <p>clear (9) 26:12;31:7;63:22;95:12; 100:12;177:21;189:19; 233:12;249:22</p> <p>clearly (1) 120:6</p> <p>clients (4) 9:13;73:14;132:14;215:8</p> <p>climate (3) 37:10,13;38:1</p> <p>clip (1) 210:3</p> <p>close (6) 42:5;61:7;144:23;191:16; 204:13,13</p> <p>closely (1) 56:7</p> <p>closer (7) 41:9;44:23;82:22;84:8,8; 97:4;243:4</p> <p>closing (1) 265:3</p> <p>CLU (2) 32:25;199:12</p> <p>Coalition (66) 25:14,16;29:15;36:8;37:3; 23;40:1,11;43:22;45:21; 46:14;53:12,25;59:10;61:15; 62:1,23;63:2;88:24;92:7; 95:13;103:8;125:23;130:17; 131:5,21;135:3,7;143:21; 146:19;170:14;171:20; 174:21;175:25;183:15; 189:21;191:25;197:15; 200:19;201:15,22;203:18; 211:2,19;221:14;226:16; 227:20;232:7;233:21;234:2; 235:3,5;236:20,24;238:10; 243:22;245:9;248:25; 253:14;254:14,17;255:4,9, 18;258:10;260:5</p> <p>Coalition/Idaho (1) 223:16</p> <p>Coalition's (5) 27:15;39:11;135:18; 179:11;253:17</p> <p>co-chair (2) 122:25;123:1</p>	<p>coherent (4) 156:24;158:18;188:14,14</p> <p>collectively (3) 147:1,1,18</p> <p>color (1) 104:20</p> <p>Colorado (1) 11:13</p> <p>colors (1) 104:24</p> <p>column (29) 18:4,7,15;19:3,6,14,19; 29:11,18,19,24;30:3,6,10; 55:20;56:18,23;85:13,16,20, 23;86:10,11;143:15;191:21; 247:16;250:10,13;251:22</p> <p>columns (8) 19:5;60:15;85:12;86:22; 93:11,12;143:5,11</p> <p>combine (1) 71:24</p> <p>combined (2) 78:6;171:3</p> <p>comfortable (5) 74:24;122:9;175:17,21; 199:4</p> <p>coming (9) 35:3,18;53:3;97:16; 145:10,11;153:1;253:9; 254:10</p> <p>comment (7) 18:3;27:13;34:5,9;56:9; 105:12;203:4</p> <p>commented (1) 117:24</p> <p>comments (18) 14:1,12,16;25:20;26:7,9, 10,11,18,22;27:3;45:24; 52:20;63:11,12;92:11,15; 197:17</p> <p>commissioned (1) 31:16</p> <p>committed (1) 29:17</p> <p>committee (38) 13:5,7,10;22:10;23:15; 24:8,11;29:4;31:18;40:10; 65:14,16,20;73:3,11,24; 74:21;76:24;78:13,17,18; 79:5,16;81:6,11,14;106:13; 159:16,20;170:2,3;176:18; 214:8;219:9,14;223:13,15,19</p> <p>committees (1) 13:3</p> <p>common (13) 16:13;213:11;245:12; 254:23;257:11;259:7; 260:23;262:14;263:3,5,6,22; 264:3</p> <p>communicates (1) 202:17</p> <p>communication (4) 202:7,8,15,21</p>	<p>Company (35) 19:23;20:15;27:19;30:16, 18;46:10;49:4;54:16,19; 56:19;58:5,7,15;60:15;62:3; 94:4;95:10;112:15;114:10; 127:14;132:22,23;140:22; 152:8;194:21,23;197:5; 209:24;210:15,19;223:7; 235:6,15;261:24,25</p> <p>company's (2) 151:9;235:19</p> <p>compare (3) 47:22;83:10;190:21</p> <p>compared (13) 45:12,18;50:3;60:12; 81:20,23,25;86:8;101:3; 126:17;216:25;244:25; 247:12</p> <p>compares (2) 72:15;76:8</p> <p>comparing (1) 45:10</p> <p>comparison (3) 82:4;116:13;224:17</p> <p>comparisons (2) 107:17;219:19</p> <p>compatible (1) 223:3</p> <p>compensate (1) 78:2</p> <p>complained (2) 129:4,6</p> <p>complete (2) 22:12;56:16</p> <p>completed (2) 22:21;93:1</p> <p>completely (4) 49:24;57:23;176:20; 241:23</p> <p>compliance (12) 135:23;136:16,20;137:1,7, 11,13;138:1,1,12,18,19</p> <p>comply (6) 136:11,16,19,23;137:6; 146:22</p> <p>complying (2) 136:2;137:20</p> <p>component (6) 36:23;38:1;57:22;76:20; 79:15;83:4</p> <p>components (22) 15:19;36:12;38:12,14; 67:12;68:2,6,8;70:13;74:5; 77:4,17,19;78:12;79:14; 83:2,16,25;108:1,10,17; 203:2</p> <p>compounding (1) 55:3</p> <p>comprehensive (2) 50:18;52:13</p> <p>compressed (2) 15:20;22:18</p> <p>comprised (1)</p>
--	--	---	---

<p>259:8 computer (1) 208:2 conceptual (6) 68:11,18;71:18;108:10; 176:24;189:15 conceptualization (1) 68:22 conceptualizations (1) 69:22 conceptually (2) 68:11;179:16 concern (10) 44:12;49:14,16,19,22; 61:17;74:20;76:23;83:9; 191:19 concerned (5) 50:15;79:11;80:14;131:2; 174:2 concerning (8) 112:9;115:2;134:3; 139:19;242:17;243:1,6; 253:24 concerns (11) 48:25;49:1;54:4;73:23; 74:3;101:13;102:25;120:5; 242:17;243:2,7 concise (3) 153:21;161:1;180:15 conclude (2) 22:10;191:9 concluded (1) 42:12 conclusion (12) 21:20;30:24;99:4;109:25; 134:20;155:21,25;161:20; 188:7,9,10;251:3 conclusions (13) 35:21,22;42:8,10;84:20; 86:19;87:6;92:23;93:24; 155:15;156:17;157:2;191:6 conclusory (1) 200:23 condition (3) 162:23;164:24;214:23 conditions (6) 51:23;52:2,66:10;70:10; 76:14;107:12 conductance (1) 107:5 conductivity (3) 66:4;105:24,25 confidence (4) 94:9;98:13;107:16;176:7 configuration (1) 122:1 figured (1) 219:25 confirm (6) 31:25;64:25;95:5;123:11; 184:2;225:9 conflicting (1) 168:6</p>	<p>confused (1) 134:7 confuses (1) 218:3 confusing (1) 31:6 confusion (2) 196:13;206:12 conglomeration (1) 18:8 conjunctive (5) 90:6;177:22;216:2,6;257:1 connection (2) 86:1;240:19 connections (1) 121:12 connectivity (1) 70:9 consensus (1) 170:5 consequence (3) 156:14;201:12;205:1 consequences (3) 201:10,19;221:17 conservation (3) 12:14,16;147:5 conservatism (11) 41:20;42:23,25;43:2; 103:16;202:25;203:4,14,17, 25;204:7 conservative (7) 97:5;103:12;197:16;203:2, 11,12,13 conserve (3) 131:11;147:2,19 consider (12) 37:18;43:6;109:4;167:16; 169:19;180:22;181:1,17; 207:18,19;233:13,15 consideration (3) 100:5;192:25;224:7 considerations (1) 100:8 considered (17) 37:19;39:19;40:7;45:7,14; 46:21;47:14;162:3,4;167:10; 169:13;185:3;186:11;187:6; 198:5;213:23;220:21 considering (5) 39:15;63:19;79:8;167:13; 181:5 considers (2) 37:14;230:12 consistency (4) 154:16;156:15;158:4; 186:13 consistent (10) 36:3;45:22;58:5;62:11; 97:2,4,7;120:17,19;226:2 consistently (6) 30:16;31:11;49:12;62:16; 64:20;82:2 consists (2)</p>	<p>230:12;263:6 constrained (4) 44:4;98:14;99:8;217:21 constraints (5) 158:12;184:18;193:7; 205:8,9 construing (1) 163:22 consultants (2) 211:25;212:20 consulted (1) 82:6 consulting (3) 11:24;13:1;207:22 consumptive (9) 31:23;35:5;66:14;74:7; 79:14;96:13;108:17;127:17; 163:8 contained (2) 23:25;231:17 contains (1) 217:4 contend (2) 118:7;251:14 content (1) 230:15 contention (1) 250:4 contested (1) 241:6 context (8) 100:22;120:3;163:23,23; 172:2;174:3;224:4;245:9 continually (1) 34:14 continuance (1) 231:18 continue (7) 24:25;62:18;78:21; 131:19;142:8,24,25 Continued (4) 7:2;101:14;131:11,13 continues (3) 196:1;212:25;220:16 continuing (1) 218:14 continuous (1) 163:3 Contor (13) 121:19;149:17,18;150:1, 12,18;194:6;207:2;211:7,9; 212:13;218:9;227:21 C-o-n-t-o-r (1) 150:18 contribute (6) 139:6,12,13;232:6;242:11; 260:22 contribution (1) 248:19 control (4) 71:25;107:3;235:22;236:1 controlling (2) 71:2;107:6</p>	<p>controls (4) 68:14;70:5,10;72:3 convene (2) 17:12;28:21 convenient (1) 172:24 convening (1) 264:16 conversation (1) 175:18 convert (1) 247:6 copies (2) 14:19;153:14 copy (3) 14:8;162:12;245:24 corn (1) 125:12 Corps (1) 230:8 corrections (3) 120:13;121:5;157:6 correctly (2) 87:25;238:6 correlated (1) 50:8 correspond (1) 199:16 corresponding (1) 165:25 cost (4) 177:16,18;179:15;220:20 cost-benefit (1) 221:4 costly (1) 199:24 costs (1) 260:4 counsel (4) 120:16,24;121:4;138:24 counting (4) 47:4,7,13;119:5 County (3) 124:13,13,14 couple (24) 42:1;44:5;48:18;77:18; 82:1;140:10;141:16,18; 142:5;143:1,5;162:5;180:11; 186:13;193:21;200:22; 201:8;234:24,25;236:5; 237:8;257:16;259:6;261:5 course (4) 130:25;140:15;204:16; 254:6 COURT (26) 9:6;11:7;15:4;26:21; 28:12;33:5,10;64:11;78:15; 97:20;98:17,21;116:8; 152:19;153:15;185:14; 190:17;222:11;224:13; 227:16;242:19,21,22;243:5, 10;249:19 courts (3)</p>
--	---	---	---

<p>216:9;227:5,9 cover (2) 162:16;229:18 covered (2) 185:8;188:3 covers (2) 35:14;229:19 create (5) 42:2;60:11;153:8;185:19, 23 created (6) 32:15;48:6;56:1;198:22; 214:11;215:14 creates (5) 40:16;42:16;113:20; 168:10;208:14 creating (3) 37:6,7;79:12 credibility (1) 198:6 credit (1) 198:8 Creek (3) 232:22;233:7;234:13 CREP (1) 12:13 crested (3) 169:20;221:1,3 Cresto (3) 21:14;22:6;25:20 criteria (29) 36:25;37:9,12,16;38:12, 15,25;39:9,18,23,24;41:14; 44:14,23;45:15,18;52:15; 62:21,24;172:14;173:21; 174:3,16;203:10;204:5; 213:21,21,22;219:8 crierias (1) 40:6 criterion (10) 174:13;176:12;202:24; 203:10;204:12,15,21;205:4; 206:6;213:20 criticism (1) 202:12 criticized (1) 104:11 critique (1) 69:24 crop (11) 27:22,23,24;36:13;112:22; 113:4,5,7;114:17,22;195:2 crops (5) 125:10,12,14,15;150:25 cross (3) 140:3;236:24;257:13 Cross-Examination (22) 7:7,8,9;89:8,21;110:25; 112:4;132:5,8;140:6;149:10; 207:5;211:1,5;226:22; 236:19;243:21;244:1;253:4; 257:23;258:3,7 cross-examine (1)</p>	<p>111:18 cross-examining (1) 89:25 cross-hatched (1) 191:2 crossing (1) 257:21 cubic-feet-per-second (1) 163:19 cumulative (2) 167:16;203:6 curious (2) 212:17,21 current (18) 22:13;23:3;26:3,18;37:18; 45:18;48:23;76:20;82:17; 85:7;115:11;122:24;152:10; 171:23;216:14;229:4; 245:14;255:8 currently (5) 22:12;203:22;207:15; 226:10;263:6 cursor (1) 154:22 curtail (8) 86:3,9;88:21;164:2; 178:10;179:4;222:2,2 curtailed (18) 43:12;56:15;57:5;85:22; 86:12,16,23;87:2;88:10,12, 17,20;131:3;163:7;164:6; 178:16,21;226:14 curtailing (1) 256:8 curtailment (69) 37:8;41:24;43:4,11,14; 55:5;56:2,5,13,13,17;57:10; 60:5;65:4,8;72:1;75:15,16; 84:10;85:7,15,20,21;87:3; 115:22;116:4,12;120:11,23; 128:12,16,18,24;129:2,10; 130:3,9,13;131:8;138:21,22; 140:13;145:2,6,10,11; 156:21;160:3;163:4,6,9,23; 165:3,6,8,24;166:3;181:12; 187:12;192:13;196:15,16; 201:16;216:15;224:10; 226:3,7;240:1;256:11 curtailments (3) 128:5;163:3;226:11 curve (2) 43:6;56:1 cut (3) 200:3;201:13;239:7 cutoff (1) 166:13 cuts (1) 200:18</p>	<p>dairy (1) 125:2 Dam (3) 229:21;232:10;262:1 darker (2) 70:22;104:20 dashed (2) 70:23;75:18 data (72) 20:11;27:7;28:25;30:22; 31:11;32:21;34:10;35:1,3, 14,47;23;50:13;57:17;66:14, 23;67:24;68:20;74:7;78:24; 79:4,23;81:23;82:1,4,5,14; 85:7;94:7,8;106:4;118:3,4,8, 8,18;171:10;173:8,9,9,23; 177:7,8;182:15;183:13,14, 18,21;189:17,22;195:5,6; 197:13,14,18;198:17,20; 199:19;200:8,12;202:2; 203:23;208:3,9;222:23; 223:22;224:3,11;230:12; 231:4;242:17;243:1,6 Dataset (36) 29:21,23;30:21;31:14,19; 32:1,5,9,15,19;33:17;34:2,4, 6,12,16,18,21;35:8;36:15; 58:10;63:16,20;93:17;94:12; 95:3,16,24;96:12;118:23,25; 182:22;197:13;198:21; 200:6,8 datasets (9) 29:3;31:1;55:24;93:13,22; 94:14;95:15;199:5,10 date (32) 12:21;29:13,16,17;43:5, 11;56:5,13,17;60:5;65:8; 69:22;85:7;87:3;96:6; 104:14;115:22;120:11,23; 128:16;130:15;138:22; 144:4;165:25;166:3,13,23, 25;196:15;224:6;226:3,18 dated (3) 20:6;21:15;26:14 dates (6) 56:2;92:16;96:3,16; 116:12;199:19 day (4) 170:23;229:13,16;264:14 days (4) 38:3;241:9,10,10 dealing (3) 108:13;256:9,10 dealt (3) 74:9;114:25;132:12 debating (1) 169:4 decade (1) 216:7 December (6) 128:16;130:15;211:12,13, 16;226:18 decide (1)</p>	<p>79:3 decided (3) 39:20;79:7;148:10 decision (14) 50:11;116:23,25;139:15; 156:10;161:11;174:6,7,8,16; 175:1;192:10,18;206:7 decisions (2) 138:16;204:20 decline (3) 142:4,24;143:2 declined (1) 141:21 declines (3) 140:24;142:23,25 decree (1) 18:10 decreed (1) 209:15 defensibility (2) 198:1;206:11 defensible (11) 156:1;167:8;183:9,12; 184:5;185:24;186:3,6,8; 200:7,11 defensibly (1) 183:16 deficiencies (2) 189:14;202:20 defined (1) 66:2 defines (2) 162:22;164:23 definitely (2) 22:17;46:7 definition (4) 109:8;164:9;165:12;193:2 degradation (1) 51:1 degrade (1) 51:11 degrading (4) 49:6,11,12;201:10 degree (9) 11:17,19;38:3;113:8; 150:25;151:1,2;191:25; 229:3 degrees (1) 171:21 delineation (1) 32:22 deliver (3) 91:16,24;99:3 delivered (1) 234:21 deliveries (1) 132:25 delivering (2) 98:9,23 delivery (4) 68:17;172:3;211:19; 243:13 demand (45)</p>
	D		
	<p>daily (1) 223:5</p>		

17:15;20;18:7,16,17,23; 19:4;20:4,7,12,21;21:7;22:1, 8;23:3;27:25;30:8,12;31:10; 36:14,23;37:2,21;40:20; 41:19;42:18,22;43:7,10,22; 53:15;57:14,20,21,24;58:9; 59:1,17;65:9;97:6;101:6; 113:14;114:10;172:3;226:8	165:10;173:3;183:8;187:18; 202:14;207:25;228:23; 230:11;246:22	differed (1) 171:5	discharging (1) 71:8
demands (2) 53:24;97:15	described (5) 45:3;93:11;170:13; 187:20;208:21	difference (22) 40:15,17;54:7;55:14; 58:13;60:4;75:23,24;76:1,2, 15,16;83:16,20;84:10;94:9; 95:17;114:4,13;134:1; 171:21;240:3	disconnect (1) 240:23
demonstrate (1) 55:6	describes (2) 84:20;208:25	differences (6) 74:12;75:5;77:1;83:18; 107:21;108:2	discrete (1) 199:13
demonstrates (1) 57:6	describing (4) 21:22;65:10;72:11;73:2	different (46) 18:8;25:23;30:24;35:22; 38:20;45:7;46:14,19;47:1, 13;49:24;50:4;75:25;79:8; 80:2,5,21;82:1,11;96:2; 113:19;116:12;119:2; 135:17;160:15,16;167:6,11; 169:24;173:23,24;191:5; 196:19;199:14;202:22; 208:17;215:24;216:21; 217:25;218:10,11,17;232:6; 241:4;247:5,12	discretion (2) 103:14;106:11
Department (75) 13:21;14:1;17:12;18:6; 20:23;22:21;23:22;24:24; 25:15;26:7,25;27:8;28:2,20; 29:6;31:8;32:7;34:3,12; 35:25;36:9;37:13;40:7;42:2; 45:14;46:7;49:2;55:13; 57:18;58:1,11;61:21;63:9; 69:19,20;75:14;80:25;81:10, 17;82:8,12;85:6;92:13; 93:14;94:15;95:9,11;97:10, 17;103:5;106:3;108:24; 117:22;118:3,7;121:1,6; 138:17;143:8;151:11,15; 154:7;159:18,19;176:15; 180:23;185:22;198:20; 199:15;205:3,18;210:5; 215:11;216:5;225:18	design (4) 159:16;182:2;212:23; 214:6	differentiate (1) 66:3	discretization (1) 170:20
Departments (1) 29:23	designated (1) 29:16	difficult (5) 53:6;185:19;203:8;210:2; 250:24	discretized (2) 33:3,8
Department's (16) 17:25;29:20;44:9;47:20; 50:11;55:22;61:10;65:12; 92:23;103:14;104:12; 113:14;161:4;214:11;216:2; 226:17	designations (1) 33:4	dig (1) 162:6	discuss (5) 16:7;67:17;76:19;103:24; 188:22
depend (3) 213:9;226:13,15	designed (2) 32:25;168:20	Direct (21) 7:5,6;11:1;39:4;43:15; 87:22;90:4,12;92:3;122:13; 138:5;140:10,11;142:7; 149:15;150:10;212:11; 226:8;228:17;236:23;237:3	discussed (25) 14:12;17:14;23:12;47:18; 50:11;52:11;62:20;78:24; 81:15;92:4,21;99:14,16; 107:15;112:17;148:18; 173:2;180:9,10;186:15; 192:3,4;201:11;218:22; 230:24
depending (3) 59:22;96:5;181:11	desire (1) 142:15	directed (2) 17:12;28:21	discusses (2) 34:21;119:1
depends (7) 141:4;170:19;175:19; 176:2;206:6;209:9;213:19	detail (1) 15:14	direction (3) 31:17;137:3;190:11	diffusion (6) 57:6;64:18;146:18;186:2; 196:8;235:14
depict (5) 209:7,19;232:1;246:23,24	detailed (7) 15:7;21:3;32:23,24;34:18; 35:16;209:2	directly (3) 20:3;84:23;232:6	discussion (15) 25:7,11,12;112:11;167:25; 186:17;194:12;196:6; 197:18;198:17;201:5;202:4, 11;205:17;206:10
depicted (2) 209:25;232:12	determination (10) 56:11;97:20;101:15; 113:1;118:14;142:14; 180:23;182:4;219:5;235:21	Director (25) 9:21;10:2,24;16:20;39:5; 64:2;92:13;110:1;124:5; 127:25;128:15;134:22; 135:21;137:13,22;138:17; 145:25;147:16;148:22; 193:20;194:4;196:2;206:23; 235:14;236:8	discussions (3) 186:19;223:23,25
depicts (1) 232:2	determinations (1) 101:4	Director's (2) 148:5;216:10	display (1) 208:3
deployed (1) 220:23	determine (12) 53:1;65:8;115:6,10; 139:22;166:12;173:14; 200:9;203:23;231:10; 244:10;264:22	disagree (1) 27:14	dispute (4) 135:2,6,10,13
deposition (1) 56:20	determined (9) 54:2;55:21;57:23;60:24; 62:25;110:15,19;116:19; 133:2	disappointing (1) 171:23	distance (2) 10:15;85:25
deputy (1) 240:25	determining (4) 25:9;199:7;210:18;226:2	discharge (16) 50:1;66:23;68:14;70:6,13; 71:2,7;102:16,18,22;105:5; 119:23;151:12;163:2;217:5, 18	distort (1) 187:7
describe (19) 21:25;25:25;46:18; 124:21;150:24;151:4; 155:14;158:25;163:18,20;	development (3) 34:24;65:11;242:11	discharges (2) 49:23;50:2	distorts (1) 187:8
	deviation (5) 44:19;59:6,9;103:7,18		distribute (1) 264:20
	dictating (1) 70:5		distribution (5) 72:20;76:16;203:7;234:3; 238:20
	Dictionary (2) 162:22;164:23		district (106) 27:19;85:9,18,20,22,25; 86:12;89:25;112:7,8;123:4, 6,9,12,13,14,15,15,16,16,17, 21,25;124:3,5,11,19,22; 125:1,3,6,8,9,11,16,20,24; 126:1,4,7,10,22,25;127:6,7; 128:10,12;129:2;130:6,14; 131:13;132:14,17;133:4,6,8, 12,15;134:4,8,9;136:10,19, 25;137:8,14;139:17;142:14, 16,21;144:2;147:6;148:10, 14;150:2,14;151:21;152:9,
	differ (2) 191:10;192:14		

<p>19;153:5;211:8,11,14,20; 213:12;229:6,11,12,13,17, 22;230:2,3,23;231:3;233:25; 237:12;238:22;244:4; 246:16,17;247:20;251:13; 261:7;263:14,23</p> <p>districts (25) 29:22;85:14;86:5,14,25; 87:2;118:5;123:8;126:14,17, 21;136:19;139:21;143:9; 145:18,24;146:25;147:8,13, 19,23,25;148:1,10,18</p> <p>district's (2) 85:10;146:21</p> <p>ditch (1) 132:24</p> <p>divergent (1) 170:10</p> <p>diversion (25) 40:12;56:21,23,25;57:3,8; 63:4;81:23;82:5;125:18; 126:15,18,21;127:16; 131:14;183:22;213:6; 229:14;241:1;247:12,24; 248:5;250:4;263:23,25</p> <p>diversions (31) 37:23;39:1,11;40:2;41:6,7; 42:16;45:21;61:16;62:22; 63:2;102:2;113:4;116:17; 133:13;134:4;229:16,21; 230:23;234:8,22;239:13,16, 23,25;241:2,8,14;246:25; 248:21;260:3</p> <p>diversions' (1) 39:3</p> <p>divert (8) 41:15;125:17,21;126:3; 127:8,15,18;178:15</p> <p>diverted (15) 57:2;113:25;239:15; 241:15;246:24;247:16,17,18, 22;249:25;250:12;251:12, 20,22;252:1</p> <p>divided (1) 251:20</p> <p>doctrine (2) 238:19,25</p> <p>document (22) 25:25;26:1,13;32:14; 87:11;120:19;129:14;149:5; 153:24;154:23;155:8; 159:22;160:13;182:2;198:6; 206:19,20;217:9;231:20; 236:14;246:12;252:16</p> <p>documents (12) 15:4;154:21;155:2,11; 159:16,23;181:22;183:7,9; 184:1;214:7;215:21</p> <p>done (58) 12:9,11,15;15:6;16:4,4; 28:2;30:4;34:18;35:23; 43:25;48:10;50:19,19;52:18; 58:3;61:14;64:4;65:12,13;</p>	<p>69:17,19;82:12,13;85:1; 87:14;95:15;106:7;108:6; 128:9;131:15;139:23,24; 143:12,14;151:25;158:8; 168:16;177:12,12,13;188:8, 20,21;190:10;192:19; 198:12;205:23;206:5; 211:13;217:21;223:9,11; 226:10;231:24;249:4; 262:10;264:14</p> <p>doubled (1) 178:23</p> <p>double-sided (1) 218:3</p> <p>ditch (1) 132:24</p> <p>down (20) 22:6;23:11;67:5;77:4; 82:21;85:14;98:7;114:3; 141:19;142:23;153:16; 196:11;204:23;234:3,8; 239:7;240:10,12;244:25; 249:1</p> <p>downstream (5) 234:9;239:4,14;241:22; 242:8</p> <p>drain (1) 197:4</p> <p>drainage (1) 232:22</p> <p>drainages (4) 233:14;234:11,13;248:20</p> <p>dramatically (1) 141:20</p> <p>drastic (2) 73:19;80:20</p> <p>drastically (1) 74:18</p> <p>draw (4) 93:24;96:20;191:7;234:4</p> <p>draws (1) 209:12</p> <p>Driggs-Tetonia (1) 240:8</p> <p>drivers (1) 75:5</p> <p>dry (3) 43:18;60:25,25</p> <p>due (3) 108:2;158:11;184:18</p> <p>duly (4) 10:18;122:5;150:3;228:10</p> <p>duplication (1) 129:17</p> <p>during (20) 12:7;14:15;19:11;22:19; 72:9;90:9;91:25;92:3;115:7, 15;151:20;170:1;194:8; 196:4,25;198:16;199:20; 222:24;248:6;264:8</p> <p>duties (2) 237:11,11</p>	<p>earlier (14) 27:18;33:16;83:9;93:5,11; 101:18;157:5;201:1;203:9; 206:13;215:17;231:13; 239:5;260:16</p> <p>early (3) 92:4;96:7;222:21</p> <p>earnest (1) 211:15</p> <p>ease (1) 149:1</p> <p>easier (2) 99:6,9</p> <p>easily (1) 66:5</p> <p>east (2) 105:7;122:19</p> <p>Eastern (22) 12:2,4;13:6,8;31:16,18; 44:1;49:24;50:5;65:13;73:3, 10;106:10;159:15;170:2,14; 175:25;176:17;182:12; 214:7;223:14,19</p> <p>easy (2) 123:10;195:11</p> <p>economic (1) 177:20</p> <p>economics (1) 151:2</p> <p>edited (1) 164:13</p> <p>educational (3) 11:16;150:24;228:23</p> <p>effect (13) 128:4;156:13,13;163:19, 20;178:25;179:3,8,21;180:1; 181:7;197:19;243:14</p> <p>effects (13) 53:5;160:3;165:6,24; 167:14,16,18,20;173:15; 180:3;203:6;214:21;223:4</p> <p>efficiencies (2) 15:11;114:3</p> <p>efficiency (12) 23:7;113:2,3,5,12,16,23; 114:12,14,18,21;221:20</p> <p>efficient (3) 63:2;221:5,21</p> <p>efficiently (1) 222:1</p> <p>effort (2) 48:9;174:22</p> <p>efforts (11) 90:10,24;92:4,14;95:14; 101:20,21,21;102:11,15,17</p> <p>eight (3) 11:24;152:18;203:11</p> <p>either (23) 18:10;27:6;29:12;33:12; 60:15;61:12,20;62:13;78:10; 79:19;93:12;95:5;116:3; 162:1,4;167:20;177:11; 196:20;200:18;201:13,13;</p>	<p>203:20;256:13</p> <p>election (1) 230:1</p> <p>elementary (1) 262:18</p> <p>elevations (1) 241:19</p> <p>eliminate (1) 130:10</p> <p>eliminates (1) 83:8</p> <p>Elisheva (1) 10:4</p> <p>else (8) 42:11;50:8;112:24; 128:13;161:24;184:12; 227:17;257:21</p> <p>emailed (3) 231:13;245:23;261:6</p> <p>embarrassment (1) 163:14</p> <p>embodied (2) 191:1,3</p> <p>emerges (1) 240:14</p> <p>employed (3) 43:3;51:8;152:8</p> <p>employee (1) 229:10</p> <p>employees (1) 132:24</p> <p>employer (1) 152:6</p> <p>employment (1) 207:21</p> <p>employs (2) 132:22,23</p> <p>enabled (1) 158:20</p> <p>encounters (1) 71:4</p> <p>end (5) 46:15;111:10;164:13; 193:19;253:23</p> <p>ended (2) 134:5;159:13</p> <p>endorse (1) 219:15</p> <p>ends (1) 195:20</p> <p>engineering (2) 19:16;69:18</p> <p>Engineers (1) 230:8</p> <p>enough (8) 140:15;175:11,14,20; 187:4;198:14;204:25;258:23</p> <p>ensure (5) 100:19;101:9;120:18; 141:8;198:25</p> <p>ensures (3) 41:14,16;63:5</p> <p>entail (1)</p>
E			

<p>208:1 entered (3) 131:6;134:10;136:12 entering (2) 194:19;195:12 entire (10) 35:4;42:18,22;44:16;66:1; 154:22;162:3;167:10;179:2; 239:8 entities (13) 28:12;37:3;40:12;46:14; 53:3,12,25;54:10;55:1; 59:10;62:23;95:13;232:8 entity (1) 113:12 environment (1) 105:23 environmental (3) 11:18;152:7;190:12 envision (1) 118:2 equal (1) 166:8 equation (1) 173:8 equations (1) 243:15 equivalent (4) 166:2;230:14;231:14; 236:12 erroneous (3) 27:23,24;113:21 erroneously (2) 179:7;181:10 error (4) 62:6;67:24,25;118:6 errors (2) 68:1,21 ESHMC (2) 159:20;170:2 ESPA (8) 55:6;90:6,18,22;91:23; 101:20,21;128:2 ESPAM (44) 13:9;34:23;55:24;56:2; 63:14,15,20;64:16;65:5,7,11; 67:1;68:16,18;70:7;75:21; 76:19;77:18;79:13;81:12; 82:17;103:25;106:2;110:20; 151:20;154:10;155:5;156:1; 158:24;159:1,18;160:2; 163:1;165:2;168:19;169:13; 170:11;172:6,15,18;176:15; 179:23;183:10;216:6 ESPAM1.0 (1) 160:2 ESPAM1.1 (5) 69:21;72:15,24;104:14; 159:11 ESPAM2.0 (1) 159:12 ESPAM2.1 (6) 75:20;76:9;107:18;171:7;</p>	<p>191:1;219:16 ESPAM2.2 (22) 69:23;73:2,5;75:22;76:8; 77:1;80:18;81:5,9;83:3,19; 106:22;107:16;108:6;158:2, 10;171:12;173:14;191:3; 216:13;219:15;227:16 essentially (41) 20:10;27:13,15;30:6; 31:10;32:20;37:1,17;38:3, 23;40:17;45:6;47:9;55:13, 19;59:4;60:4,8,17;61:11; 65:11;68:1;69:10,20,24; 70:5,19;71:18;72:3;73:24; 74:6;75:13;76:3,11;85:5; 104:17;156:7,17;221:4; 230:17;231:23 establish (3) 39:25;53:11;205:4 established (1) 204:21 establishes (1) 52:16 establishing (2) 174:16;204:5 estimate (14) 63:23;77:10,11;79:10; 91:3;108:22;164:8;173:10; 179:20;180:2;189:1;191:18; 192:12;225:15 estimates (3) 214:20,25;225:10 estimating (2) 34:15;188:23 estimations (1) 173:15 ET (12) 31:22;35:1,8,11;79:10; 82:1,3,6;89:25;140:9;211:8; 244:4 eternity (1) 166:7 ETRAN (4) 191:1,3;224:15,19 evacuate (1) 235:25 evaluate (10) 15:6;23:15;25:16;27:1; 36:7;40:6;51:21;52:3; 155:24;213:21 evaluated (2) 46:13;219:8 evaluating (3) 38:4;69:21;173:5 evaluation (2) 40:21;47:20 evapotranspiration (5) 31:22;35:3,18;38:2;208:6 even (13) 52:2;55:6;61:5;105:21,23; 136:15;140:18;141:7; 157:24;168:24;170:9; 178:12;239:15</p>	<p>eventually (1) 165:9 everybody (5) 111:4;128:13;264:22; 265:1,12 everybody's (1) 255:12 everyone (4) 131:18;138:18;147:23; 174:1 evidence (13) 58:6;87:12;94:2;99:11; 118:7;129:19;149:6;204:2; 206:21;236:15;252:15,17; 264:19 evolution (5) 40:14;72:12;73:8;74:16; 80:17 evolved (1) 38:19 exact (1) 50:12 Exactly (9) 27:24;34:7;80:7;106:8; 107:6;128:7;166:8;181:7; 198:14 Examination (18) 7:5,6,10;10:12;11:1;87:22; 117:11;119:18;122:13; 138:6;144:13;150:10;227:3; 228:17;236:23;237:3; 248:23;261:3 examinations (1) 151:22 examine (2) 89:18;252:23 examining (1) 10:3 example (16) 19:18;35:11;37:13;73:20; 94:6,11,19;95:24;113:17; 140:19;143:11;163:5;165:7; 209:4,19;260:11 Except (1) 179:16 exception (2) 159:7;229:24 excerpt (3) 148:24;246:9,15 excerpts (1) 70:17 excess (1) 201:16 exclude (1) 196:1 excluded (1) 259:25 excludes (1) 118:8 exclusion (1) 208:11 excuse (2) 91:17;242:19</p>	<p>exhaustively (1) 173:23 Exhibit (59) 14:7,14,17;16:13;17:7; 20:19;21:10;23:19;24:6; 26:4;28:15;87:8,12,13;88:1; 114:8;129:13,17,19,22,23; 145:14;148:23,24,25;149:6, 7;153:13;154:19;157:13; 162:7,8;164:11,15;182:7,17; 190:1,2;206:17,19,21,22; 217:23;227:24;231:15; 236:9,12,15,16;246:6,7; 247:3,12;250:20;252:11,13, 15,17,18 exhibits (5) 16:13,15;264:18,23,25 exist (4) 107:13;108:11;156:23; 189:23 exists (1) 179:18 expanded (1) 258:16 expect (4) 88:7,9;145:9,11 expected (1) 188:23 expedited (2) 153:20,21 experience (11) 51:5,18;63:13;141:7; 158:24;194:18;195:11; 208:21;215:25;248:7;250:19 expert (16) 13:17;14:5,11,22;24:3,4; 37:15;98:2;129:18;149:4; 150:23;153:8,25;187:4; 206:17;248:21 experts (1) 82:7 explain (39) 18:3;20:2;21:19;26:21; 28:18;30:23;31:13;32:13; 34:22;35:21;38:19;43:20; 48:24;53:9;54:5;55:8,9; 57:16;58:18;65:6,21;69:14; 71:15;72:14;74:1,75:10; 76:7,21;80:24;84:18;95:17; 104:8;165:21;166:9;173:18; 177:15;190:13;239:2;259:4 explainable (1) 173:12 explained (3) 49:9;173:8;251:3 explaining (1) 171:14 explains (2) 49:8;171:16 explicitly (1) 233:12 exploration (4) 158:5;174:17;185:7;</p>
--	--	--	--

<p>192:20 explore (3) 184:14;185:5;249:2 explored (3) 158:1,8;173:22 exploring (1) 138:7 expressed (4) 142:15;164:7;165:9;215:1 extended (2) 40:5;81:3 extent (5) 159:12,19;181:3;213:5; 220:12 extracted (1) 20:3 extreme (1) 39:22 extremely (1) 86:8 eye (1) 52:5</p>	<p>174:1;197:5;209:23;210:15, 19;223:7;228:9;235:6,11,15, 18;236:3;238:21;260:12,13; 261:24 false (3) 204:10,17,18 familiar (18) 12:1,23;65:18;100:6; 109:9;198:10;207:22; 208:20;213:24;216:21; 230:6;235:2;237:19,23,25; 238:24;246:12;247:2 far (6) 19:19;243:14;255:3,22; 256:18;263:17 farm (1) 150:25 farmed (1) 151:6 far-right (1) 250:10 farther (1) 225:2 fashion (3) 108:19;187:6;188:14 fault (1) 199:24 favor (4) 42:17;59:4;103:7;200:19 feature (3) 109:11,12;208:12 features (1) 189:23 fed (1) 239:11 feed (1) 242:3 feel (3) 67:17;122:9;199:4 feet (5) 54:12;141:22,23,24;142:2 fell (2) 199:21;236:24 Ferrari (1) 221:2 few (17) 110:8;112:9;134:9; 144:15;145:13;172:9; 200:23;204:12,15;207:7; 211:8;218:14;222:17; 233:18;257:7,12;262:12 field (9) 79:2,20;81:18;95:22; 151:22;194:19;195:8,13; 200:3 field-by-field (2) 35:17;81:24 fields (1) 33:1 Fifth (50) 13:15;14:23;15:17;40:3; 45:8,15;54:9,14,17;55:4; 60:12,16;61:2;96:21;127:22,</p>	<p>25;137:23;154:18;155:21; 158:15;161:6;162:7,18; 165:13;166:24;167:7,17,22; 168:8;172:13;180:13,25; 185:12;186:2,5,21;187:10, 15,23;188:5;197:9;198:1; 199:8;200:9;202:23;203:23; 225:8,10;227:11;242:11 figure (46) 30:18;32:12,13;35:10,13; 55:25;60:10;70:15,25;72:16, 18;73:1;74:15;75:1,2,9,12; 76:7;77:7,9;80:4,17,23; 82:15,16,24;83:1,94:20; 100:18,24;104:10;120:12,12, 14,22;129:18;157:10,12,12; 165:18,21,22;166:6;190:5; 191:13,20 Figures (12) 38:7,9,11;44:13;70:16; 72:19;99:23;190:4,5,14,21; 193:5 file (2) 246:1,2 filed (1) 231:18 files (2) 56:4;85:6 fill (7) 140:18;141:1,5;229:22; 235:17,21;259:7 filled (1) 235:19 Final (1) 39:13 finally (2) 135:13;233:1 find (13) 10:7;32:24;56:5;118:5; 162:14;164:13;166:13,14; 168:3;172:16;187:24;208:8; 218:5 Finding (4) 162:20;163:11;180:16; 192:23 findings (4) 160:9,12;190:14,19 fine (7) 9:23;11:5,12;24:14;90:3; 106:16;142:18 finer (2) 189:1,2 finished (1) 253:25 first (37) 10:18;28:22;29:18;30:14; 38:22,22;39:4;43:16;76:25; 85:13,19;112:10;119:22; 122:5,10;132:16;140:11; 142:3;143:5,11,15;150:3; 151:12;155:19;159:11; 163:13;170:6;183:20,24; 187:9;191:17,17,19;192:21;</p>	<p>228:9;237:9;250:13 fit (3) 66:24;103:25;104:9 fits (1) 39:9 five (4) 147:11;171:6;191:16; 241:10 five-day (1) 241:11 five-eighths (2) 56:25;57:3 five-month (2) 168:2;191:15 flagged (1) 51:22 Fletcher (59) 7:8,11;24:8;110:25;111:1, 12,18,20,23;112:1,5,6; 116:15;117:1,4;119:13,14; 132:6,9,12;134:17;135:21; 136:4,5,9;138:3,7,8;140:1; 145:16,25;146:6,9,17;149:3, 11;226:23,24;249:3,7,15,22; 252:10,19,21,25;253:2,5,6; 257:3,7,24;258:15;259:2; 262:12,16,21;263:2;264:10 flew (1) 200:2 flexible (1) 106:25 flood (2) 235:22;236:1 flow (33) 37:25;52:10;70:10,12; 152:1;197:4,18,21;229:12; 230:9,18;234:2,4,8,18,21; 237:15;238:3,7;239:8,8; 242:8;244:10;248:19; 253:11,20;254:25;255:23; 259:9,15;263:9,10,13 flows (6) 49:21;119:23;197:8; 198:8;253:9;254:9 focus (2) 59:12;75:12 focused (6) 25:8;30:2;94:4;154:23; 167:18;201:21 folks (4) 164:19;212:4;221:18; 242:14 follow (1) 259:23 following (7) 26:6;29:15;30:10;81:10; 100:20;133:24;244:15 follows (5) 10:20;122:6;150:4; 228:11;237:9 follow-up (4) 144:15;175:4;201:9;261:5 follow-ups (1)</p>
F			
<p>fact (20) 78:7;84:21;101:3;105:9; 128:11;136:14;138:17; 146:6;162:20;163:12;166:6; 178:19;179:1;180:16; 192:23;200:4;206:14;210:8; 248:18;256:13 factor (5) 37:13;171:6;186:9; 192:14;219:20 factors (5) 37:10;169:12,16;188:22; 230:16 factual (1) 155:20 factually (2) 155:22;156:9 failure (1) 183:18 failures (1) 183:21 fair (12) 96:19;101:11;140:13; 141:9;143:15,23;148:16; 168:12;172:1;180:25; 192:11;258:23 fairly (1) 141:20 fall (2) 27:25;95:25 Falls (50) 19:22;20:14;27:19;30:16, 18;31:5;42:14,16;46:9;49:4; 50:25;52:1;54:19;56:19; 58:4,7,14;59:12;60:14;71:5; 94:4,23;95:10;102:3;104:18, 23;105:2;112:8,15;114:9; 123:14;132:22,23;151:14;</p>			

140:10 Foods (1) 258:10 forces (2) 71:6,7 forecast (46) 22:8;41:19;46:2,9,13,21, 24;48:9,20,22,24;49:10; 50:18,24;52:4,5,14,22,22,24; 53:4;58:23,24,25;59:2,2,3,6, 10;88:23;101:12;102:14; 201:25;230:6,11,12,25; 233:12,16;234:15;244:8,13, 18,18,23,24 forecasted (4) 37:2;101:14;102:19;103:2 forecasting (3) 23:1;53:5;230:18 forecasts (2) 22:11;244:22 foregone (2) 178:21;197:24 Fork (6) 123:16;201:20;232:11,19; 233:5,13 form (1) 30:24 former (1) 252:24 formulated (1) 125:24 forward (9) 10:7;88:7;89:1;121:23; 130:23;149:19;220:9; 243:23;262:17 found (13) 32:15;39:5;48:20;136:15; 137:7,13,19;138:11;156:9; 166:16;171:4,11;235:14 foundation (1) 146:9 four (8) 88:15;154:4;181:24; 183:6;191:15;212:18;229:1, 8 four-layer (1) 106:10 Fourth (7) 54:9,13,16;60:13,16,23; 145:5 fraction (2) 131:9;178:20 fractions (1) 154:13 frame (8) 15:21;22:9,16,18;92:15; 156:16;189:7;192:25 frames (1) 188:17 framework (3) 70:1;71:13;181:17 frameworks (4) 181:23;184:4;185:3,6	free (1) 234:17 frequently (2) 238:1,11 fresh (1) 153:1 frightening (1) 171:21 , 'from (1) 38:25 F front (6) 21:13;139:1;143:4; 145:14;153:24;233:9 frustrating (1) 136:14 FS (1) 83:12 full (7) 56:13;57:2;141:9,11; 157:11;198:13;236:3 fully (3) 135:25;163:5;165:6 function (3) 76:9;105:4;114:17 functions (1) 211:23 fundamentally (2) 167:11;173:6 funded (1) 182:23 furnish (1) 115:14 further (31) 15:4;23:9;51:10;80:18; 87:15;101:5;110:24;117:2; 131:1;132:4;140:3;142:22; 149:9,11;158:1,8;184:19; 192:20;194:3;206:24; 210:22;226:22,23;234:3,12, 15;241:18,21;243:18;262:3, 4 futile (5) 238:18,25;239:24;240:18; 241:13 futile-call (1) 256:4 Future (11) 24:8,10,25;25:6;50:13; 51:4;63:5;81:11;248:11; 251:25;256:11 G gage (6) 67:25;230:9;232:20,23; 233:3,17 gain (5)	67:22,25;86:3;107:17,21 gains (6) 66:22;75:7,7;107:11; 108:4,22 Garrick (1) 9:20 Gary (1) 21:14 gave (4) 26:7;81:1;170:14;248:13 gears (2) 186:12,14 general (10) 97:22;101:19,24;108:8; 157:15,19;182:15,15; 221:25;261:10 generally (13) 25:8;125:10;126:20; 155:14;196:7;208:1;222:4; 232:1;235:2;237:19;246:22; 247:6;254:14 generate (4) 55:24;156:4;158:6,21 generated (7) 93:14;95:24;156:21;159:9, 21,22;210:5 generates (1) 43:8 generating (2) 96:11;191:7 generic (1) 254:13 geographically (1) 85:9 geologic (2) 70:1;105:17 geology (2) 70:11;104:25 gets (1) 67:3 GIS (2) 207:23;208:13 given (18) 18:21;22:10;29:6;50:25; 100:5;117:15;122:9;125:25; 126:2;127:11;135:24; 140:21;155:21;158:18; 184:13;202:9;248:1;258:14 gives (2) 67:6;191:10 giving (1) 103:22 goal (6) 115:14;116:16;167:20,25; 168:3,4 goals (3) 167:11,23;168:6 goes (10) 19:10;159:5,5;212:10; 241:24;242:17;243:1,7; 248:22;263:9 good (29) 9:15;10:6;11:3;43:24;	44:3;50:17;51:21;52:21; 87:24;89:23;112:6;132:11; 140:8,9,12;141:7;150:12; 160:12;169:23;175:11,14; 204:24;205:10;207:7;211:7; 221:11;237:5;253:8;258:9 Gooding (1) 124:13 go-round (1) 122:10 gosh (1) 11:9 grab (2) 162:7,12 grain (2) 106:16,24 grains (1) 125:14 grant (1) 34:25 graph (2) 77:19;191:17 gravity (9) 174:9,19,21;175:1,16; 189:20;220:23;221:8,13 gray (3) 33:24;83:6,10 Great (5) 9:24;94:10;109:11; 234:25;236:7 greater (1) 234:1 greatly (1) 176:7 green (3) 32:22;33:23;83:3 Greg (4) 173:1;180:9;181:16;188:1 Ground (15) 122:22;123:13;150:2,14; 152:9;153:5;181:8;194:19; 195:13;211:20;213:4; 223:17;241:17,23;242:7 groundwater (124) 12:12;16:2;23:6,12,14; 24:21;43:12;56:14;57:4; 62:12;63:9,24;65:5;66:14; 72:3;75:16;76:5;79:14; 83:20;85:9,25;87:2,16; 88:11,17,19;89:7;91:4; 105:18;107:7,8;109:15; 110:11,15;119:23;123:3,5, 12,13,14,15,16,16,17,25; 124:11,15;125:19,21,24; 126:14,17,24;128:10;130:6, 23;133:3,3,7,8,8,13,16; 139:17,21;141:13,15,16; 142:14;144:1,2,3;145:18; 146:25;147:1,6,8,13,18,23; 148:9;151:7;156:7;160:3; 172:11;174:23;178:7,10,13, 14,16,20;180:21;181:18,23; 183:10,13,21,22;184:8;
--	---	--	--

<p>185:4,17;203:19;204:9; 207:1,9,15,18;209:16,23; 210:25;211:11;213:25; 216:15;222:1,3,9,15,17,20, 23;223:4;224:4;264:9 group (49) 13:23,24;14:2,3;17:13,19; 20:6,9,24;21:21;22:21,25; 24:20;26:8,24;28:5,9,21,22; 29:4,7;32:17;40:9;45:9,25; 46:5,20;47:17;48:3,11,17; 51:20;53:21;54:22;60:10; 63:18;65:16;78:24;87:16; 89:7;92:5,8;93:9;100:10; 139:21;152:24;207:1; 210:25;223:16 groups (3) 12:17;13:20;35:23 grower (1) 223:1 growing (3) 38:3;41:17;195:2 grown (2) 125:11,14 guarantee (1) 141:10 guaranteed (1) 204:16 guess (18) 10:14;40:13;62:15;86:21, 21;111:9;146:20;175:4; 176:14;218:15;221:19; 250:19;252:4;256:15; 257:13;258:1;262:14;264:14 guessing (1) 191:22 guys (2) 9:18;153:15</p>	<p>200:1 happening (2) 93:25;128:18 happens (1) 71:1 happy (1) 111:7 harbor (7) 137:9,15,18,21;138:13,16, 20 hard (6) 15:12;74:1;78:9;177:13; 210:11;258:2 hardened (1) 27:6 harm (1) 201:22 harms (2) 203:18,19 Harris (23) 7:5,10;207:3,6;210:22; 227:25;228:15,18;236:8,17; 244:7;248:9,12,17,18,24; 249:5,10;257:5,6;261:1,4; 262:3 Harris's (1) 237:9 hay (1) 200:3 Hazelton (1) 122:20 head (2) 47:8;247:18 head] (1) 144:18 header (1) 103:22 hear (11) 9:8,19,22,23;111:24,24; 132:20;213:2;244:5;249:18; 265:7 heard (10) 26:23;27:18;33:16;49:15; 106:3;119:7;132:17;177:20; 178:8;244:21 HEARING (131) 9:3,7,15,20,22,24;10:3,6, 12,22;13:14,19;16:12,22,24; 23:18,23;24:5,10,15;26:1,5; 47:2;64:5,7,10,12;87:9,11, 15,18,20;89:6,13,16;109:20, 20,22;110:5,24;111:4,8,16, 22;112:2;117:3,7;119:11,13, 15,19;121:2,7,10,15,16,18, 22,25;122:8,11;132:5; 134:14,18,21,24;136:1; 138:5;140:3;144:11;146:8, 11;149:2,5,9,13,18,21;150:6; 158:16;160:21;184:22; 193:11,23;194:2;195:19,21, 24;204:22;206:18,20;207:1; 210:24;212:12;218:5; 226:22,24;227:18,25;</p>	<p>228:13;236:11,14,19;237:1; 242:21;243:3,20;248:16,24; 249:8,11,18;250:24;251:6; 252:14,16,19,22;253:1; 257:5,18;258:2;261:1;262:4, 8,11,16;264:11;265:5,11,15 heartburn (1) 187:19 Heise (15) 52:23;201:24;218:19; 230:9,16,19,20;231:25; 232:17,20,23;233:2,17; 244:8;253:9 held (4) 13:20;28:23;229:7;235:3 Hello (1) 195:19 help (3) 133:10;175:7;193:4 helped (4) 30:24;79:25;133:23; 234:22 helpful (4) 232:5;240:5;264:21;265:1 Henry's (6) 123:16;201:20;232:11,19; 233:5,13 hey (2) 222:1;253:6 Hi (3) 117:13;132:10;244:3 Higgs (10) 85:2;121:11,16;133:22; 138:25;143:3;145:15; 211:21,23;212:25 high (9) 63:5;104:19;144:7,8; 197:22;201:25;203:18; 228:24;234:11 higher (19) 41:12;53:24;57:8;59:18; 62:24,25;82:3;96:25;99:7; 104:21,24;113:20;126:8,18, 20;204:7;234:14;241:19; 259:11 highest (1) 37:24 highlight (1) 83:22 highlighted (3) 82:25;83:1,9 highlighting (4) 56:10,24;60:17;108:15 highlights (1) 60:19 Hill (1) 50:1 hindcast (11) 18:24;19:1,7;55:13;56:15; 57:18;60:4;88:2,2,13,15 hip (2) 175:18,21 hip-shot (2)</p>	<p>203:17,21 hired (3) 159:3;211:10;212:23 historical (8) 50:1;53:17;66:13,16,18, 20,24;147:10 historically (3) 54:24;147:20,21 history (2) 122:9;151:5 hit (1) 221:12 hold (3) 33:5;230:2;242:19 holder (1) 263:19 holders (7) 236:3;245:7;254:21; 259:10,15,16;260:20 homogenous (1) 66:2 honoring (1) 134:9 hope (2) 10:12;262:17 horizontal (2) 66:4;105:24 hosts (1) 202:16 hot (1) 41:16 hour (3) 64:8;111:14;210:9 hours (4) 182:10,10,11;193:24 huge (2) 15:19;83:15 humans (1) 204:8 hydraulic (3) 70:8;105:24,25 hydrogeologic (3) 70:1,18;106:7 hydrogeological (1) 104:1 hydrographer (2) 212:25;223:1 Hydrologic (15) 13:7,9;31:17,18;43:17; 66:4;68:14;71:9;73:3,10; 86:1;159:15;170:2;176:18; 223:14 Hydrological (1) 65:14 hydrologist (4) 151:18;152:11,12;230:5 hydrology (2) 11:20;151:2</p> <hr/> <p style="text-align: center;">I</p> <hr/> <p>Idaho (21) 34:25;122:20,22;151:3,11,</p>
--	--	---	--

14,15,19;155:3;170:14; 175:25;182:12;213:4; 215:25;216:9;228:9;229:17, 20;230:21;232:4;256:24 idea (5) 52:20;80:2;142:22; 221:25;241:24 ideally (1) 174:8 identical (1) 163:3 identification (1) 100:1 identified (28) 14:7,14,16;19:5;28:11; 45:4;46:4;93:22,23;95:4; 100:4,13;101:13;102:25; 152:13;157:6;169:6,12; 176:11;181:21;183:16; 186:13;204:1;225:10,18; 226:17;236:22;249:5 identifies (2) 25:6;222:19 identify (19) 33:15,20;36:20;91:23; 95:14,15;97:18;123:5; 153:23;154:2;157:19; 167:23;179:6;184:2;199:13; 232:16;246:14;248:20; 264:25 identifying (1) 27:6 IDWR (22) 30:19,21;31:13;33:17; 34:21;36:6;152:14,20;155:5; 161:5;165:23;168:20; 177:12;191:2;199:16; 200:14,15;203:23;207:21; 208:8;229:10;231:24 IDWR's (1) 129:24 ignoring (1) 156:14 IGWA (27) 10:5,18;12:3,6,7,16,21; 15:23;61:25;73:14;90:10,14, 20;92:12;122:5,24,25;123:2, 9,22;135:2,7;136:16;139:12, 15;146:19;236:22 IGWA's (6) 12:12;16:14;85:13;123:5; 129:24,24 illustrate (1) 70:20 illustrates (1) 86:24 image (3) 9:9;33:12,22 imagery (6) 27:6;33:15,20;96:3,3; 199:16 images (1) 35:14	immediately (2) 81:13;183:16 impact (15) 57:12;76:13;85:17,18; 88:3;100:24;102:19;108:18; 110:18;128:7,11;129:8; 130:2;197:7;214:19 impacted (1) 184:21 impacting (1) 110:16 impacts (7) 106:16;109:16;110:12; 148:17;163:4,9;214:16 imperfect (1) 197:14 impermeable (6) 70:4,24;71:4,7;105:1; 106:21 implementation (2) 28:24;30:2 implemented (6) 18:25;21:24;28:6;107:13; 206:2;227:10 implementing (1) 20:17 implication (2) 185:10;204:18 implications (5) 158:1;160:1;162:4;181:5; 225:6 importance (1) 183:6 important (19) 42:24;59:16;65:24;67:8, 17;156:23;157:9;170:24; 171:19;172:21;173:5; 175:24;177:2;182:2,13,16; 186:9;191:24;201:23 imposing (1) 126:15 impossible (1) 189:9 imprecision (3) 179:9;183:5;191:25 impression (1) 248:14 improve (14) 22:11;28:3;46:11,21; 47:11;51:4,7;80:4;176:7,14; 177:14;189:12;192:3;199:17 improved (4) 25:10;46:10;48:20;158:14 improvement (3) 17:14;68:20;176:25 improvements (5) 21:25;48:9;81:12;108:3,5 improving (1) 52:10 inadequate (1) 201:14 inappropriate (1) 105:13	incentive (2) 63:1,4 inception (1) 124:4 include (6) 91:6;119:3;160:5;164:9; 208:23;232:11 included (9) 31:9;44:24;45:16;56:23; 57:13,20;62:4;171:8;230:14 includes (8) 18:23,25;27:5;33:18; 49:16;118:18;230:16;253:20 including (6) 52:16;91:7;107:14;119:7; 152:18;255:9 inclusion (3) 186:7,8;208:11 incomplete (2) 68:22;197:14 incorporated (1) 243:15 incorrect (4) 68:21;165:14,16;217:20 increase (5) 54:11;77:25;78:5;79:2; 142:1 increased (1) 99:22 increases (3) 54:23;163:2;220:2 increasing (4) 62:22;77:16;78:10,11 increasingly (1) 62:24 incredibly (1) 178:24 incurred (1) 260:4 indefensible (1) 170:12 independent (3) 177:8;179:19;199:3 Index (1) 48:19 indicate (5) 107:21;165:4,8;191:3; 215:13 indicated (4) 140:11;143:5;183:14; 221:15 indicates (3) 18:1;187:16;191:22 indication (2) 190:23;191:17 individual (9) 33:1,2;38:12;53:2;126:2; 147:5;160:12;222:25;247:13 individually (3) 59:16;137:17;182:24 in-field (1) 81:22 infinite (2)	164:2,4 inflow (1) 66:15 inflows (1) 254:4 influence (2) 76:4;102:15 influenced (2) 49:20;80:1 influencing (1) 102:12 inform (9) 169:8,8;174:6,15,24; 192:10,18;193:4;204:20 information (34) 28:4;29:1;32:7;34:10,11; 35:24;36:18,20;40:8;56:19; 57:19;60:7,9,14,18;94:15,16; 95:9;106:6;115:25;116:2; 148:16;153:2;154:25;155:4, 10;160:8;180:22;183:13; 185:23;197:25;198:4; 243:16;246:18 informative (1) 40:24 informed (2) 205:3;206:8 informing (1) 176:6 inherent (1) 187:2 inherently (2) 67:18;200:18 initial (3) 77:10,11;219:4 initially (4) 82:13;160:2;212:15; 230:13 initiated (1) 133:6 injured (4) 101:9;115:15,19;245:10 injury (3) 116:17,19;235:15 input (10) 49:13;66:14;71:20;74:9, 10;108:11;159:4;165:3; 170:21;171:10 inputs (2) 19:16;74:3 inquire (1) 134:22 inquiry (1) 146:2 ins (1) 159:5 in-season (32) 17:15,20;18:7,16,17,23; 19:1,4;20:4,7,12,21;21:7; 22:1;23:2;30:8,12;31:10; 36:14,19,23;57:21,24;58:9; 86:16;113:14;114:10; 116:14;133:12;168:1;172:3;
--	--	--	---

<p>256:9 inside (1) 253:1 insights (1) 158:21 insist (1) 179:1 inspection (1) 157:11 instance (3) 169:22;178:3;208:5 instead (6) 41:5;57:25;105:9;232:17; 234:7,20 Institute (3) 11:18,20;155:4 instituted (1) 196:16 instruments (3) 188:16;192:24;193:1 insufficient (2) 23:14;54:25 intended (1) 131:22 intent (2) 131:24;168:24 interaction (1) 159:7 interactions (2) 107:4,10 interacts (1) 107:7 interconnected (1) 71:9 interest (2) 180:14;208:12 interesting (1) 86:22 interfingering (2) 70:21;104:25 interlayered (1) 70:21 interpreted (1) 147:17 interrupt (3) 15:13;249:20;251:7 interrupting (1) 195:21 interruption (1) 195:25 intervening (1) 94:7 intimately (1) 199:2 into (59) 27:25;28:10;33:18;42:19; 44:5,7;46:8;53:1;61:12; 62:14;78:9;85:8;87:12; 91:16,24;95:21;100:23; 102:9;109:1;113:23;114:25; 125:24;129:19;131:6; 133:23;149:6;157:12,21; 162:6;179:12,23;183:21;</p>	<p>191:11;199:21;204:7; 206:21;214:24;234:12,20; 236:10,15;240:15;241:17,22, 23;242:7,17;243:1,7,15; 251:20;252:15,17;253:10; 254:4,10;256:11;262:17; 264:19 introducing (1) 74:6 introduction (1) 48:19 intuitively (1) 204:8 investigation (4) 70:19;81:19,22;195:9 investment (1) 189:21 invited (1) 152:22 involved (5) 101:19;123:2;159:20; 183:20;199:2 involvement (1) 158:23 involving (2) 137:23,25 irrigate (2) 175:20;209:14 irrigated (115) 15:5;16:8,10;17:16,18,24; 18:9,10,18;19:3,11;20:11,18; 21:5;25:7,9,12;26:17,24; 27:5,20;28:8,17;29:1,3,21, 23,25;30:15,17,19,21;31:3,3, 5,14,21,25;32:4,8,15,18,21; 33:13,17,18,23;36:2,5,8,21, 21;58:10;64:18,20;79:2; 93:8,13,16,23;94:12,14,19; 95:3,7,16,18,21,24;96:6,9,10, 11,12;114:3,9;117:21;118:4, 8,13,19,23,25;119:2,4,5; 125:5,8,8;151:6;172:11; 178:4;181:8;194:13;195:5; 198:17,20,21;199:5,7;200:8, 9;209:6,10;247:21,24;248:1, 4,5,15;250:8,11;251:18,19, 24 irrigating (2) 64:21;250:14 irrigation (46) 23:2;27:19;28:12;37:11, 17,19,22;38:5;44:15;49:21; 51:25;53:13;89:24;91:19,21, 25;93:2;95:21;100:15;112:7; 123:9,21;127:6,7;163:7; 181:2,6;182:5;185:11,20; 194:18;195:1;196:12,17; 199:14;210:19;211:8; 222:24;226:8;229:16; 234:22;239:19;241:20; 244:4;253:23;254:1 irrigators (2) 124:15;138:21</p>	<p>isolation (1) 195:3 isolations (1) 194:25 isotropic (1) 66:2 issue (16) 16:8;22:14;51:16;63:8; 69:15;81:15;96:19;99:16; 102:12;106:12;179:14; 184:14;186:15;199:25; 204:6;244:13 issued (6) 127:22;128:15,25;129:2; 230:7;231:23 issues (17) 17:13,14;45:25;46:4; 71:13;90:6;92:20;108:16; 136:7;151:5;154:5,24; 176:11;186:13;204:4; 211:15;262:22 item (1) 64:17 items (1) 205:11 IWRRI (9) 158:24;159:1,2,25;182:12; 195:4;198:22;207:21;214:4</p> <hr/> <p style="text-align: center;">J</p> <hr/> <p>Jackson (4) 140:19;235:11,22;236:1 January (9) 45:24;73:4,9,23;76:24; 81:1;211:12,17;244:20 Jaxon (6) 85:2;121:11;133:22; 138:25;143:3;145:15 Jay (2) 132:18;194:8 Jefferson (2) 86:6;123:15 Jennifer (3) 43:6;55:23;115:24 Jennifer's (1) 83:1 Jerome (1) 124:13 job (4) 182:12;204:25;217:22; 244:23 John (2) 89:23;140:8 JOHNS (28) 149:16,20;150:8,11,13; 153:17,21,23;162:10,12,17; 185:18;190:19;191:6; 193:19;194:3,4,7;196:2,3; 206:16,23;212:9;215:18; 222:18;227:1,4,17 join (1) 9:12</p>	<p>joined (1) 123:4 joint (5) 52:22;230:6;233:12,16; 244:7 joke (1) 253:1 judgment (1) 241:6 July (4) 44:17;52:3,5;58:19 June (1) 9:4 junior (21) 41:24;43:14;55:5;56:14; 57:4;65:5;75:17;88:11,17, 19;109:15;110:11,15; 116:17;126:8;130:25;131:2; 234:6;240:1,2;256:21 juniors (2) 37:8;57:10 jurisdiction (1) 238:21 justifiable (1) 162:2 justifications (4) 161:3,5,21,25 justify (2) 154:7;174:25 justifying (1) 157:2</p> <hr/> <p style="text-align: center;">K</p> <hr/> <p>keep (4) 63:4;237:14;243:10; 246:17 Kent (5) 111:7;112:6;132:12; 253:6;257:10 Kilgore (1) 189:6 Kimberly (1) 50:1 kind (44) 15:4,12;27:10;32:22; 35:15;42:2,9,11;48:1,12; 49:25;52:1,24;57:5;69:14; 70:22,24;71:13;72:12;74:10; 80:3;81:15,24;84:19,20; 86:13;101:2;104:23;105:7; 106:5;108:8;141:25;154:4; 168:5;174:14,15;175:22; 177:17;180:11;183:17; 195:25;212:10;246:17; 249:19 Kindred (1) 190:11 kinds (1) 176:2 King (1) 50:1 KLAHN (3)</p>
---	---	--	---

<p>9:12;265:3,9 knew (1) 128:7 knowledge (12) 23:8;156:2;160:8;161:17; 172:13;198:19;206:8;212:1; 213:5;227:6,13,15 known (5) 108:17;160:14,15;189:23; 203:7</p>	<p>Law (1) 188:7 lax (3) 98:6,7;99:1 lay (3) 27:10;69:25;177:21 layer (2) 65:25;106:2 layered (1) 202:10 layering (1) 189:16 layers (10) 70:3,4,24;71:5,7;105:14, 25;106:4,20,25 laying (1) 45:6 lays (2) 22:23;85:5 lead (2) 70:13;159:25 leading (3) 84:1,4;102:17 leads (1) 55:5 lease (1) 238:14 leased (1) 238:2 leases (3) 237:16;255:15,18 least (14) 34:4,9;52:21;88:19,24,25; 120:19;160:9;162:15;175:2; 185:15;205:24;211:18;258:4 led (2) 185:7;200:5 left (8) 19:19;35:13;73:1;77:10; 82:19;129:23;198:22;200:22 legal (4) 109:25;134:19;214:19; 251:2 legend (1) 165:25 lengthy (1) 170:16 less (27) 30:17;31:4;56:25;57:2; 59:7;64:21;72:11;80:11; 88:16;100:6;105:24;109:13; 128:11;131:10;139:14; 171:15,16,16;178:15;186:3, 5;189:2;201:13;222:3; 250:14;254:1;263:24 level (14) 37:7;62:14;66:22;94:9; 108:13;142:24;173:13,20; 200:5;203:14,16,16,24;204:3 levels (9) 52:1;54:25;66:21;73:20; 75:6;107:8;141:16;204:6,8 lies (1)</p>	<p>208:10 lieu (1) 187:12 lighter (1) 70:25 liked (8) 15:5,10,16;24:25;157:20, 22;158:7;215:7 likely (5) 51:6,10;74:8,11;242:9 limitation (7) 92:19,19,25;189:4,5; 260:8;264:6 limitations (2) 68:17;263:21 limited (5) 22:9,15;92:20;193:5;247:9 limits (5) 125:20;126:15,18,22; 180:2 line (17) 70:23;75:18,20;77:13,14; 109:4,7,8,15;110:3,9,20; 146:2;163:14;165:23; 176:19;259:1 linear (1) 52:14 lines (5) 75:12;77:20;96:8;111:1; 208:18 links (2) 36:13;231:4 lipstick (1) 176:21 list (7) 32:6;46:19;121:11; 149:14;212:18;250:2;264:18 listed (6) 247:3;248:8;250:15; 251:21;252:7;257:13 listened (1) 160:21 listening (1) 195:20 listing (3) 209:3;248:11;251:25 lists (1) 247:25 litigation (1) 12:8 little (20) 11:25;17:4;43:20;61:9; 65:21;66:7;78:16;84:7,8; 115:2;125:7;134:7;139:4; 141:21,22;151:9;153:16; 166:1;199:11;247:8 lived (1) 200:1 livelihood (1) 175:19 Liz (3) 21:14;22:6;25:20 local (1)</p>	<p>52:2 localized (1) 108:5 located (5) 124:12,13;157:7;225:1; 230:20 location (5) 116:20;121:12;163:4; 191:21;226:13 locations (2) 172:9;261:21 lodge (1) 248:12 logged (1) 9:10 logical (2) 154:15;158:4 logically (1) 50:6 logistical (1) 16:21 long (18) 11:22;12:1;27:16;38:4; 41:16;122:9;123:2;124:2,9; 127:19;153:25;172:12; 210:10;219:13;221:24; 229:7;241:10;257:25 longer (3) 39:17;57:22;163:10 long-term (4) 167:16,19;172:7,12 look (53) 16:9;21:11;37:22,24;38:1, 2,4;42:14,14;43:23;44:13, 20;45:18;47:22;49:19,25; 54:12,15;55:10;56:15;68:13; 69:20;77:9;80:4,17;86:5,22; 92:16;94:3;104:10,17;114:7, 7;118:22;123:7;130:5,8; 131:1;154:6,25;155:7; 174:10;176:15;179:12; 187:25;218:18;219:22; 231:12;239:3;244:8,24; 246:10;264:22 looked (17) 34:12;44:5;46:10;48:7; 61:10;63:17,19;81:18,22; 155:2,4,6,8;170:22,24; 182:23;217:16 looking (49) 12:12;16:2;17:16;22:5,25; 23:5,21;24:3;26:2,13,15; 28:16,24;40:5,17;41:2;43:7; 46:25;47:12;61:3;72:16; 73:12;75:16;77:6,7,22,23; 79:20;82:18;83:18,20;88:14; 92:11;96:22;98:4;102:21; 116:13;119:20;136:6;143:3; 165:18;180:16;190:4; 191:14;195:14;216:20; 218:2;226:6;232:18 looks (5) 19:18;32:9;62:1;120:1;</p>
L			
<p>labeled (4) 18:5;30:3;32:12;60:15 labeling (2) 18:6;29:20 laid (3) 38:22;62:21;70:11 Lake (3) 140:19;151:13;235:23 land (7) 29:23;33:4;67:13;78:1; 94:19;199:13;241:20 landfill (1) 151:25 Lands (36) 29:21,25;30:21;31:3,3,14, 25;32:4,8,15,18,21;33:17; 36:2;58:10;63:15,20;77:24; 80:10;93:13,17;94:12,14; 95:3,16,18,22,24,96:12; 118:23,25;195:5;198:20,21; 199:5;200:8 Landsat (5) 33:12;36:6;118:4,8,18 language (2) 97:23,25 lapsed (1) 44:2 large (7) 27:19;140:15;178:24; 197:13;209:2;213:7;247:11 larger (3) 128:22;174:22;179:10 largest (3) 79:9,10,13 last (39) 16:17;18:4,15,15;22:7; 23:21;24:1;26:16;30:6,10; 33:21;56:18;63:8;64:2;87:5; 98:18;118:17;120:12; 141:16,18,20;142:5;143:1,2; 144:17;148:21;156:11,15, 22;184:25;234:24;242:10; 249:16,17;251:22;253:23; 259:6,12;262:7 late (5) 53:21;95:25;111:10; 211:16;259:7 later (7) 9:12;44:8;96:7,8;151:11; 239:12,13</p>			

<p>214:16 loss (1) 185:17 Lost (4) 13:10;47:3;236:1;256:23 lot (18) 12:8,11;24:16;43:25; 63:14;69:16;73:14;86:25; 105:20;112:11;125:2,4; 128:6;195:4,7;222:3;236:5; 242:2 loudly (1) 109:23 low (6) 44:15;45:12;86:8;106:16; 202:3;203:17 lower (16) 61:15;82:22;102:1,5,7; 105:2;126:18,21;130:20; 173:25;233:22,25;239:4,25; 240:11;248:20 lowest (1) 86:14 lunch (5) 111:9,10,13,17;117:13 Lyle (1) 246:16 Lynker (3) 11:13,22,23 Lynn (13) 121:20;122:4,16,19,21; 123:10;127:24;129:12,14, 20;140:8;144:15;149:8</p>	<p>133:3,5,9 managed (1) 102:1 management (14) 16:2;90:6;130:23;151:1; 168:23,25;177:22;215:15,18, 22;216:1,2,3;257:1 manager (3) 229:5,9;230:4 managers (3) 98:8,23;99:2 manner (2) 48:10;153:20 many (15) 60:12;99:23;125:5; 127:11;132:13;152:16; 159:23;176:16;179:4; 206:14;226:11;253:15; 254:16;261:23;263:4 map (10) 32:7;208:9;231:12,14; 232:1,12,18;233:4,9;236:12 mapped (1) 35:3 maps (1) 208:4 March (4) 21:15;26:14;92:17;93:1 margin (1) 103:16 mark (1) 246:5 marked (11) 87:11;149:6;154:19; 206:19,20;227:24;231:14; 236:12,14;246:7;252:16 Maryland (1) 229:1 mask (1) 33:14 massive (1) 54:23 master (1) 229:3 master's (2) 11:19;151:2 match (10) 23:16;66:17;67:22;69:4,6, 8;77:5,16;188:17;192:25 matches (1) 68:12 matching (1) 170:17 material (3) 32:16;164:21;235:14 math (1) 178:8 mathematical (1) 203:5 Matt (11) 21:14;31:7;50:10;51:2; 60:18;63:17;119:7;172:25; 197:1,3;198:16</p>	<p>matter (14) 12:9,11;13:17,24;16:21; 69:4;102:21;150:15;152:8, 24;153:22;155:6;189:6; 261:10 matters (6) 9:16;15:14,23;152:19; 157:20;189:20 maximize (1) 177:23 maximum (7) 177:25;248:4;250:2,7,14; 251:17;255:7 May (42) 11:3;44:2;64:23;89:18; 111:12,18;115:11;120:3; 122:8;130:17;146:12; 158:20;163:14;164:11; 169:16,21;177:5,9;188:1,22; 193:13;194:5;196:1;199:13; 204:4,25;206:13;207:19; 209:14;217:20;221:21; 225:11;227:25;243:12; 244:16,18,24;247:25;248:1; 250:7,13;251:22 Maybe (21) 9:10;31:17;34:8;51:25; 53:18;56:22;59:15;62:6,19; 79:11;99:9;106:3;120:15; 171:2;209:12;211:16,16; 223:24;249:6;264:17,18 May-through-September (1) 85:17 McCain (1) 258:10 McHugh (14) 7:9;9:11;87:17,18,19,23; 89:4;249:14;257:8,22;258:8, 9;260:24;262:13 mean (24) 30:25;51:7;60:2;64:25; 72:23;75:23;84:5,22;88:21; 92:18;100:14;105:11; 107:12;110:19;114:2; 142:20;146:2;177:18; 180:10;189:21;203:22; 216:1;221:23;238:15 meaning (1) 88:22 meaningful (3) 10:13;176:8,25 meanings (1) 214:20 means (10) 19:7;53:9;56:12;66:3; 140:25;144:22;171:13,16; 173:11;176:5 meant (5) 37:4,9;180:6;187:14;222:5 measure (5) 59:4;140:17;172:18; 203:22;231:7 measured (3)</p>	<p>35:2;223:22;230:25 measurement (5) 67:25;102:23;152:1; 183:12;222:20 measures (1) 229:12 measuring (2) 151:12;231:9 median (2) 232:2;234:14 medium (1) 172:12 meet (7) 62:24;97:15;131:7; 133:10;171:9,10;238:3 meeting (10) 9:13;25:2;38:15;45:9; 46:5;81:10;131:16,18; 136:24;174:11 meetings (8) 13:22;21:21;24:9,11;25:1; 28:23,23;223:22 meets (2) 45:17;65:9 melting (1) 254:7 member (7) 13:6;88:24;123:22,24; 124:2;151:8;223:20 members (32) 25:10;26:8;39:9;94:22; 99:19,23;100:19;102:20; 112:12;123:6,9;124:18; 125:6;126:15;129:1;133:6; 136:15,25;142:15,20; 148:14;170:8,8;233:21; 235:3,5;238:10;254:13,16; 255:4,18;260:5 memo (2) 21:9;22:6 memos (1) 92:17 mentioned (17) 12:25;13:4;16:8;18:12; 19:13;50:22;51:13;52:19; 56:10;73:13;77:3;90:12; 129:20;132:16;134:8; 240:17;254:12 Merriam-Webster's (2) 162:22;164:23 mess (1) 201:3 met (2) 39:18;203:24 meter (1) 223:1 method (12) 31:21;35:1;43:2;80:21; 81:25;82:3,8;83:7;96:14; 196:15;198:25;203:17 methodologies (1) 97:3 Methodology (91)</p>
M			
<p>Madison (1) 123:17 Magic (3) 86:6;123:13;151:13 magnitude (2) 163:4;179:20 main (13) 48:1;70:5;71:3;74:3;75:4; 86:18;112:25;229:21; 239:17,21;240:18,20;242:2 mainly (1) 80:14 maintain (1) 148:11 maintained (1) 230:25 major (3) 70:10;128:8;230:23 majority (1) 217:4 makes (5) 31:7;36:15;118:10;186:4; 200:6 making (6) 38:3;84:24;109:6;151:16; 195:8;197:3 manage (3)</p>			

<p>13:15;14:23;15:17,20; 17:24;21:24;22:13;23:3; 30:7,9;31:8;36:2,12;38:9,20, 22;39:5,25;40:3,25;42:20, 23;43:3;45:8,15;53:14,19; 54:13,16;55:4;58:2;60:12, 16,17;61:8;63:4,21,24;72:2; 84:25;95:5;96:21;97:18; 100:1,13;101:7,8;112:14,19, 21;116:16;127:22,25; 137:24;145:2,5;154:18; 158:15;161:7;162:8,18; 165:13;166:10,14;167:7,17, 22;168:8;172:13;180:14; 181:1;185:12;186:2,5,21; 187:11,23;188:5;195:6; 197:9;198:2,24;199:8; 200:10,14;202:24;203:23; 207:10,14;227:11;242:12</p> <p>methods (14) 22:11;23:7;52:17;80:2,8; 156:23;182:15;183:3,5,25; 184:4;187:18;200:17;203:5</p> <p>METRIC (28) 28:25;30:3,4,22;34:21; 35:8,11,13,15,16;36:18; 58:12;74:6;78:19,22,24; 79:4,12;81:16,20,21,23,25; 82:7,14;83:5;93:17;172:17</p> <p>Mexico (3) 11:18,20;121:13</p> <p>Mickelsen (1) 123:1</p> <p>microphone (1) 243:4</p> <p>Microphones (3) 9:7;10:8;16:25</p> <p>Mics (1) 64:12</p> <p>mid- (1) 172:7</p> <p>mid-2000s (1) 123:3</p> <p>middle (1) 130:8</p> <p>midseason (1) 239:15</p> <p>mid-season (1) 22:8</p> <p>midsection (1) 130:2</p> <p>midsummer (1) 95:25</p> <p>midsummer/end (1) 239:7</p> <p>might (6) 44:8;71:14;96:8;158:21; 260:15;262:19</p> <p>million-dollar (1) 221:2</p> <p>Milner (6) 102:9;218:11;229:21; 232:10;261:25;264:1</p>	<p>mind (5) 103:22;146:2;186:4; 193:17;261:16</p> <p>mine (3) 61:17;92:17;257:20</p> <p>Minidoka (33) 19:22;50:3,21;56:7;67:23; 68:15,23;69:13;70:6,14; 71:3;72:5;84:25;85:11;86:3, 17;91:8,17,24;104:2;106:18; 107:10,17;108:22;112:7; 119:24;171:2,15;173:16; 190:24;217:1,17;218:22</p> <p>minimal (1) 41:17</p> <p>minimum (6) 36:6;172:14;173:20; 174:16;202:24;210:13</p> <p>Mining (2) 11:19,20</p> <p>minor (2) 120:13;262:12</p> <p>minus (2) 53:15;59:1</p> <p>minute (2) 184:11;227:23</p> <p>minute-by-minute (1) 223:8</p> <p>minutes (2) 64:7;111:2</p> <p>mischaracterize (1) 161:10</p> <p>mischaracterized (1) 178:3</p> <p>misheard (1) 260:15</p> <p>miss (1) 204:11</p> <p>missed (5) 33:6;78:16;116:9;158:19; 242:22</p> <p>missing (3) 113:18;197:18;204:15</p> <p>misspoke (2) 64:23;166:20</p> <p>misstates (1) 146:9</p> <p>mistake (1) 58:23</p> <p>mistaken (1) 249:6</p> <p>mistakes (1) 157:6</p> <p>misunderstood (1) 222:6</p> <p>misuse (1) 169:5</p> <p>misused (1) 169:6</p> <p>mitigate (4) 110:17;131:4;139:13,14</p> <p>mitigating (2) 109:16;110:12</p>	<p>mitigation (35) 12:11,13,15;134:10;137:7, 8,12,14,20,25;138:1,12,13; 139:19;145:17;156:20; 166:18;167:3,5;187:12; 188:10;201:16;226:3,9; 245:11,20;258:17,19; 259:21;260:1,8,9,18;264:7,9</p> <p>mixed (2) 63:15,20</p> <p>model (224) 13:9;31:19,24,24;32:1; 34:15,23;35:5,8,12;43:3; 46:9,11;48:17;49:8,10,16; 50:9;52:4,25;55:24;56:3,4; 59:3;63:14,15,20,24;64:16; 65:5,7,11,12,18,20,21,25; 66:1,1,9,12,12,14,15,18;67:1, 10,16,19,20;68:5,8,9,10,11, 18,22;69:4,5,5,15,21,25; 70:2,7,8;71:13,18;72:9,10, 13,23;73:2,11,15,16,18,25; 74:2,4,9,19,22;75:14,25; 76:10,12,18,20;77:18,25; 78:4,10;79:13,17,22;81:3,5, 5,7,13;82:17,20;83:12,19,24, 25;84:2,12,23;85:6;86:25; 90:18,22;91:10,14,14,22,25; 96:14;105:9,10,13,18,20; 106:10;107:14,22;108:8,10, 14,25;110:20;115:5,12,12, 16,17,18;117:14;118:5; 128:2;130:16;148:6;156:2,4; 158:7,10;159:4,10,10,12,18; 160:2,2,16;163:2;164:4,5; 170:1,4,11,17,19,23,25; 171:9,10,13,19;173:5,8; 174:17;176:2,3,20,24;177:2, 4;179:14,17;180:2;189:1,3, 15,18;191:21,23;192:11,21; 202:10,12,13,16,20;205:20, 24,25;206:3;213:25;214:3, 13;215:3,5,14;216:6,10,14, 18,21;218:12;219:11,25; 220:16,19;223:22;224:16, 18;225:11,14;226:7;227:6, 10;243:14</p> <p>modeled (2) 165:4;171:11</p> <p>modeler (2) 67:3,6</p> <p>modeler's (1) 106:11</p> <p>modeling (57) 12:8,12,14,15;13:4,7,10; 15:6;31:18;65:14;73:3,10; 90:14;94:6;106:13;143:17; 154:8,16,17;155:6;156:1,16; 158:1,24;159:16,20;160:6, 10,15;162:4;166:4;170:2; 172:23;174:3;176:18; 179:19,19;181:25;187:3; 188:14,15;189:22,24;190:7,</p>	<p>10;191:1;196:14;198:11; 199:1;204:9;219:9;223:12, 15,19;224:4;225:24;226:1</p> <p>models (30) 15:7;46:13,22,24;47:11, 18,21,24;48:9,20,22;50:18, 25;52:5,10,14;53:4;59:2,11; 67:18;74:16;104:22;105:20; 151:20;154:10,11;191:10, 12;192:14;206:1</p> <p>models' (1) 190:23</p> <p>model's (1) 191:18</p> <p>MODFLOW (5) 106:15,19,23,23;107:13</p> <p>modification (1) 99:17</p> <p>modified (1) 143:13</p> <p>moisture (1) 230:17</p> <p>moment (7) 16:21;47:2,3;89:11;117:6; 146:18;248:16</p> <p>moments (1) 110:8</p> <p>monitor (3) 50:12;132:25;133:12</p> <p>monthly (4) 173:14;223:10;244:13,19</p> <p>months (5) 23:5;191:15,16;234:24; 262:20</p> <p>moratorium (1) 144:4</p> <p>more (64) 15:10,14,15;28:8;39:8; 45:19,21;50:20;51:10,24; 52:12,13;54:2;58:14;60:12; 63:6,6;72:11;78:9;82:6; 88:12,18;97:2,4,5,7;100:5,6; 108:3;126:7,8;129:25; 139:12;147:19,21;156:20; 158:18,18,18;164:10; 167:19;170:15,15,16;171:6; 172:6;176:5,6;184:13,14; 186:7,8;200:13;204:7;221:5; 222:1,1,20;224:3;233:18; 234:6,20,25;264:11</p> <p>morning (8) 9:17;11:3;87:24;89:23; 90:1,5;264:15;265:13</p> <p>most (34) 32:4,23;33:2;36:6,15,16; 46:8;55:6;56:7;58:10;61:3; 88:9;94:8;102:4,8;118:3; 144:2,5,5;156:23;157:9; 168:22;182:2;190:22; 191:13;192:13;196:16; 209:2;216:14;255:4,6,17,17; 264:3</p> <p>mostly (2)</p>
---	--	---	--

60:25;231:22 motion (1) 231:18 motorcycle (1) 221:1 Mountain (4) 152:7,8;190:11;231:13 mountains (1) 145:1 move (25) 13:11;20:1;25:19;36:22; 39:13;46:2;53:7;55:2;64:15; 71:6,25;72:22;80:23;82:24; 84:17;85:16;87:7;89:11; 148:25;161:12;162:6; 180:11;206:16;236:9;252:13 moved (2) 106:22;220:9 moves (3) 66:5;76:6;241:21 Moving (9) 47:17;58:17;65:3;75:8; 80:18;86:10;161:4,5;206:11 much (36) 15:9;40:20;41:15;45:19; 52:3;78:8;79:25;82:3;88:10; 94:3;103:16;114:6;115:6; 125:16,21;127:7,15;130:20; 144:25;145:9;147:5;173:7; 174:22;176:21;178:15; 181:13,20;184:17;189:6; 191:10;192:19;193:12; 194:15;235:8;244:10;262:6 Mud (1) 151:13 multilayer (3) 105:10,17;202:12 multiple (8) 70:3;105:14,25;106:4,19; 199:19,19;203:2 multiplier (4) 156:13;179:8;181:7; 197:19 municipalities (1) 124:25 must (1) 222:6 mute (1) 195:23 muted (1) 195:20	natural (16) 37:25;52:10;77:12,17; 229:12;234:1,4,8,17,21; 237:14;239:8;248:19; 253:10,20;261:22 nature (4) 70:21;167:12,15;211:24 nauseam (1) 186:16 near (44) 28:25;30:2,4;50:3,21;56:6; 58:12;67:23;68:14;70:6,13; 71:2;72:4;75:19;76:13; 84:24;85:11;86:3,17;91:7; 104:1;105:5;106:17;107:9; 16;108:22;119:24;171:1,2, 12;172:9;173:15;190:24; 199:25;216:25;217:3,19; 218:15,20,21,25;220:11; 224:25;230:20 nearing (1) 193:19 necessarily (8) 51:23;93:24;131:25; 141:8;248:5;250:8,13; 251:18 necessary (2) 131:7;174:25 need (46) 9:16;10:14;27:22,23,25; 41:11;44:3;47:3;54:23;55:9; 60:1;91:15,23;97:15;100:17; 101:10;109:22;112:23; 113:4,5,7;114:17,22;115:7; 117:19;140:25;157:6; 168:13;169:12;176:23; 177:23,24;178:6;179:6,11; 181:9;182:8;203:12,13; 217:25;228:2;234:4;242:24; 243:4;245:15,16 needed (11) 39:16;44:11;46:10; 170:18;176:9;178:18; 181:15;194:24;201:17; 226:16;254:23 needing (1) 221:18 needless (1) 185:16 needs (9) 41:23;53:11;54:17,23; 101:6;174:21;189:20; 201:15;247:12 Neeley (17) 75:19;76:13;91:16;105:5; 171:1,12,15;216:25;217:1,4, 17,19;218:16,21,22,25; 220:11 neglecting (3) 185:10;197:7;201:19 negotiate (1) 148:9 neighbor (1)	200:2 neither (6) 167:9;170:4;217:19; 218:24;219:1;226:11 net (1) 50:20 New (18) 11:18,20;43:2;47:22,23; 48:15;60:1;72:10,10;73:17; 76:17;83:6;96:20;148:6; 190:10;191:21;258:1;259:22 Newdale (1) 240:15 next (40) 9:25;20:1;29:24;32:4; 34:16,20;39:14;40:4;46:2; 51:8;53:12,13;57:12;58:17; 59:24;72:14;74:14;75:1,8; 81:12;82:24;84:11,17;85:20, 22;86:11,22;97:15;100:15; 121:10,18,21;149:17; 155:25;156:6,12;171:22; 190:5;236:5;262:19 Nez (4) 237:23;238:3;245:3; 255:23 nine (1) 123:8 nods (1) 144:18 none (4) 23:8;138:20;236:14; 263:13 nonirrigated (21) 28:10;31:8,12;33:13,19, 24;36:3,4;57:12;58:6;67:13; 77:24;78:1;80:10;83:17; 95:6,14,15;118:15,19;200:4 Non-irrigated (1) 29:20 nonirrigation (1) 124:21 nonirrigator (1) 124:18 nontarget (1) 186:23 nor (4) 204:2;217:19;218:25; 219:1 North (22) 54:15;62:3;86:6;123:12, 25;124:11;126:18;127:6,14; 130:5,6,22;134:15;139:6; 140:21;141:14;142:13,20; 143:11,16;144:1;261:24 note (4) 40:13;61:19;68:19;180:15 notes (2) 41:2;63:17 notice (1) 195:18 noticed (3) 120:11,16;202:22	November (4) 57:13,20,22;211:16 NRCS (2) 231:1,23 NRT (1) 30:22 nuances (1) 262:13 number (49) 12:17;15:1,19;16:16; 17:13;19:20;21:5;25:23; 36:11;64:22;79:22;86:12; 92:20;93:23;94:21;101:25; 112:11,14,18,20;113:11,20; 133:1;144:22;161:16,17; 162:16;177:9;178:24; 182:17;185:16;187:3,3; 195:20;196:19;209:1;220:5; 225:17;247:25;248:3,4,5; 250:1,2,8,9;251:17,18,23 numbered (1) 155:20 numbers (8) 20:18;45:7;117:23;119:3; 143:10;242:18;243:2,8 nutshell (3) 160:14;182:9,10
O			
			Object (2) 109:18;145:25 objecting (1) 146:6 objection (27) 87:9,11;109:18,20,21; 134:12,19,23;137:22,23; 146:5;149:2,3;206:18,20; 212:9,10;236:11,13;248:9, 12;250:23,25;251:1,8; 252:14,16 objective (2) 52:13;203:13 obligation (10) 65:9;110:17,22;131:7; 139:22;143:17,20;145:24; 156:18;259:14 obligations (4) 131:14;132:1;133:10; 145:17 observation (4) 67:21,24;69:6;77:16 observations (3) 66:18,20,25 observe (3) 253:22,23;254:3 observed (9) 49:18;77:5;122:1;141:15; 171:14;173:7,10;218:12; 233:20 obtainable (2) 186:9,10 obtained (1)

229:2 obvious (1) 187:3 obviously (1) 140:25 occasionally (1) 55:7 occupation (3) 152:10,11;229:4 occur (6) 61:4;62:7,15;183:14,18; 195:17 occurred (4) 23:5;61:13;62:3;98:13 occurring (5) 102:1,2,7;204:11;210:19 occurs (3) 61:2;62:15;134:4 off (16) 15:25;16:20;35:22;55:12; 59:11;89:10,13;117:7;141:4; 195:22;227:22;239:13,22; 240:2;241:2,7 offer (2) 264:23;265:7 office (3) 210:8;237:17;242:15 OFFICER (115) 9:3,7,15,20,22,24;10:3,6, 12,22;16:12,22,24;23:18,23; 24:5,10,15;26:1,5;47:2;64:5, 7,10,12;87:9,15,18,20;89:6, 13,16;109:20,22;110:5,24; 111:4,8,16,22;112:2;117:3,7; 119:11,13,15,19;121:2,7,10, 15,18,22,25;122:8,11;132:5; 134:14,18,21,24;136:1; 138:5;140:3;144:11;146:8, 11;149:2,5,9,13,18,21;150:6; 193:23;194:2;195:19,24; 206:18;207:1;210:24; 212:12;218:5;226:22,24; 227:18,25;228:13;236:11, 19;237:1;242:21;243:20; 248:16,24;249:8,11,18; 250:24;251:6;252:14,19,22; 253:1;257:5,18;258:2;261:1; 262:4,8,11,16;264:11;265:5, 11 often (4) 35:7;54:2;109:10;213:2 old (3) 155:2;190:8;191:23 OLENICHAK (5) 7:4;228:1,8,21;262:22 O-l-e-n-i-c-h-a-k (1) 228:22 Olenichak's (1) 249:17 omission (4) 186:4;197:20,25;202:1 omit (1) 209:2	omitted (2) 197:11,12 omitting (2) 52:17;197:21 Once (3) 188:8;240:18;241:24 one (78) 9:13;10:7;17:13;24:2; 25:1;26:14;28:22;40:13; 42:13;44:18;46:6;47:25; 51:7,18;58:5;59:5,9;63:8; 64:2,17;68:7;72:4,20;74:3,4; 75:4;76:11;79:9,13,24; 88:24;89:24;98:1;103:6,18; 112:10,17;117:24;118:23; 119:15;120:22;123:8; 129:12;138:18;146:24; 156:12,18,18,22;157:9; 159:23;161:16;170:1,21; 171:6,21;172:21,24;174:24; 179:3;182:1,2;187:3;191:13; 198:11;203:4;205:15,23; 207:8;212:8;219:22;225:6; 231:22,24;236:24;237:9; 242:10;247:20 one-month (2) 205:19;206:3 onerous (1) 182:25 ones (7) 46:23;47:10;155:7; 184:10;200:23;209:2;214:9 one-year (1) 139:5 ongoing (3) 101:20;165:24;177:11 online (1) 10:9 only (52) 18:1,20;19:10;28:6;36:3,4; 37:18,19;44:16;54:10;55:7; 57:1;58:3,4;60:23;61:13,22; 88:15;91:20;92:1;115:6,12, 19;119:4;134:3;163:1; 164:22;165:3;168:9;177:6, 22;178:20;179:20;181:3; 184:10;188:12;193:5; 196:20;197:19;200:11; 204:15;220:19;230:14; 233:16;234:22;242:16,25; 243:6;244:22;253:13,17; 256:9 on-the-ground (1) 79:21 open (6) 81:20;82:1,4;213:7; 247:11;262:13 opened (1) 138:6 opens (1) 257:25 operation (2) 202:14;210:7	operations (8) 44:2;98:7,8;99:2,7,9; 132:17;133:10 operators (1) 125:3 opinion (26) 62:6;91:13;95:1;103:18; 105:8;115:2;116:24,25; 158:6;165:12;167:6;168:5, 15;185:20,22;187:21; 188:20,21;198:7;200:8; 213:8;215:20;220:19,22; 222:19;226:1 opinions (3) 154:10;155:19;199:6 opportunity (7) 26:8;98:16,20,23;158:19; 221:2;265:6 opposed (2) 97:5,19 opposes (1) 23:3 opt (4) 245:7,18;260:17,19 option (1) 260:19 oral (1) 265:8 orange (2) 77:14,21 Order (99) 13:16,16;14:23,23;15:6, 17,18;17:11,24;18:24;19:8, 9;28:20;30:7,9;38:22;39:5, 14;40:25;45:8,16;54:13,16; 55:5;58:2;60:12,16,17; 63:21,25;65:8;72:2;85:8; 88:23;96:21;97:18;101:7,9, 15;127:22,25;128:15,24; 131:4,8;134:10;136:12; 137:20,24,24;141:1;142:9; 143:9;145:2,5;154:19,20; 155:21;156:8;158:15;161:7; 162:8,18;166:10,11,15,24; 167:8,17,22;168:8,9;172:14; 177:22;180:14;181:1; 185:12;186:2,5,21;187:11, 15,17,23;188:5;192:25; 198:2;200:10;202:24; 203:24;207:10,14;225:8,10; 226:17;227:11;235:13; 242:12;263:18 orders (8) 38:20;42:4;44:20;45:22; 96:24;101:5;155:6;265:4 organization (1) 122:25 organized (1) 89:12 original (2) 158:9;168:18 originally (2) 31:16;168:20	others (6) 22:1;126:19;155:5;158:8; 182:14;259:12 Otherwise (1) 146:13 ought (1) 220:9 out (64) 20:4;22:23;27:10;34:16; 35:14;38:22;40:14;41:23; 44:11;45:6;47:5,13;52:22; 55:18;57:1;59:2;61:7;62:22; 69:25;70:11;72:11;73:13; 74:23;78:8;85:5;88:15; 105:15;106:6;126:10; 131:13;136:15,16,20;148:5, 13;152:21;160:23;166:7; 170:19;176:1;178:9;197:22; 199:25;204:14;208:8;228:6; 236:1,2;238:2;239:21; 240:14;245:7,19;255:12; 256:21;259:14;260:17,19; 262:22;263:9,18,22;264:3,25 outdated (1) 28:8 outlier-type (1) 44:24 outlined (2) 15:2;183:25 outlook (1) 43:24 outlooks (1) 98:12 output (2) 115:17;243:16 outs (1) 159:5 outside (3) 109:19,24;212:10 over (48) 11:25;14:10;38:13,19; 39:11,22;43:11;47:24;49:6; 50:5;54:18,20;55:25;56:11; 57:4;59:21;60:22;65:20; 66:13,16;71:17;85:3;88:25; 90:7,8;91:18;100:16;125:7; 131:1;132:15;135:3,8; 141:16;142:4;160:9;166:3; 169:1;182:11;183:1,1; 189:25;193:17;200:21; 216:7;230:13;234:23;236:5; 240:25 overages (1) 133:24 overcome (1) 202:19 overdivert (1) 133:16 overestimate (3) 79:12;177:10;183:23 overfit (1) 177:2 overlap (3)
--	---	--	---

<p>210:3,4,14 overlapping (2) 27:1,2 overlay (1) 32:23 overprediction (1) 102:18 Overruled (7) 110:5;134:18,21;136:3; 138:7;212:15;249:11 oversee (1) 237:12 oversight (1) 13:8 overstated (1) 112:14 owed (1) 143:21 own (8) 26:9;28:6;44:25;53:4; 126:24;127:2;133:7;249:1 owned (1) 33:2 owners (1) 33:2</p>	<p>67:4,9;71:20;76:4;80:3; 81:2;83:12;84:3,5;107:25; 202:13 parcel (1) 209:10 Pardon (1) 228:2 parsed (1) 152:21 part (38) 12:14;13:19,22,24;17:15; 28:23;49:2;62:8;65:19; 78:14,23;90:19;98:18; 101:14;103:2;105:8;106:13; 114:14;141:3;149:4;152:17; 160:12;182:13;183:1,1,24, 25;199:23;223:12,14,15; 233:22;235:13;239:4,4,5,10; 260:19 partial (1) 18:10 participant (3) 245:12,16,17 participants (1) 255:9 participate (10) 12:17;13:5,9,20;65:15; 152:23;238:11,13;254:14; 260:20 participating (4) 10:10;254:21;259:15,16 participation (1) 238:6 particular (16) 42:14;49:5;68:15;71:21; 93:21,25;96:8;106:22; 120:17;138:6;142:24; 172:20;220:11;226:19; 251:19,24 particularly (9) 43:24;44:15;45:12;50:25; 74:3,14;82:20;86:4;198:23 parties (8) 87:10;121:6;150:22; 166:17;255:5;257:18; 264:20,23 partition (3) 156:19;187:11,15 parts (4) 107:1;144:24;154:23; 215:2 party (7) 101:9;115:15,19;156:20; 221:8,9;255:4 pass (1) 262:9 passes (1) 174:13 passing (1) 234:7 past (17) 23:9;42:3;63:10;131:15, 20;136:7;137:25;144:25;</p>	<p>148:12;208:20;211:14; 229:8,9;233:10;241:10; 259:24;264:9 patron (1) 126:10 patrons (7) 125:16,21;129:4,9;130:23, 24;131:11 PATTERSON (41) 10:2,4,4,6,23,24;11:2; 16:12,14,17;17:1,2,3;23:23, 25;24:13,16,18;26:3,12; 34:1;47:4;64:2,6,13,14,15; 78:20;87:14;109:18,21,24; 111:6;117:5,6,9,12;119:10; 120:24;121:3,4 Paul (1) 182:3 pay (3) 133:21;134:1;244:21 payment (1) 238:15 PDF (3) 245:23;246:1,2 Pelot (2) 182:3,23 pending (1) 93:3 People (6) 98:13;196:1;220:10; 248:13;263:22;265:6 per (10) 133:21;134:2;164:1,2; 209:1;213:7;247:15,17,21; 251:21 per-acre (1) 125:17 Perce (4) 237:23;238:4;245:3; 255:23 percent (55) 27:14,17,20;39:2,10;40:1, 11,15,15,24;41:1,6,7,10,10; 42:6,15;45:20;49:9,12;57:8; 76:1;86:23;87:1;88:13;89:1, 2;97:7;115:20;116:3,4; 118:14;142:4;143:16,18,20; 144:23;171:14,17;173:11,17, 18;177:3,9;178:12;194:16; 196:20;203:12;225:17; 233:5,6,7,7,8;256:16 percentage (14) 41:12;76:10,12;96:25; 115:23;129:24;144:7,8; 191:14;232:2;234:14; 255:10;259:11,17 Perfect (2) 26:16;150:22 perform (16) 14:24;50:9;157:16,16; 171:24;184:19;189:24; 193:3,15;200:16;203:8; 204:19;205:18;208:4;</p>	<p>212:25;219:24 performed (13) 47:24;50:22,23;90:19; 158:11;159:1;189:11,12; 192:10;204:3;219:23;220:3, 4 performing (3) 179:24;193:8;205:21 performs (1) 213:1 perhaps (11) 51:4;105:12,13;111:22; 172:12;173:1;181:13; 188:13;192:24;221:15; 236:23 period (26) 22:19;38:13,23;39:11,15; 40:5;45:11,19;55:15;60:22; 66:13,16;81:3;88:16;91:18; 133:25;164:2;168:2;171:5; 179:2;191:15,19;205:25; 241:11;244:20;265:6 periods (1) 206:4 permeability (1) 106:16 permissible (3) 149:17;209:11,18 permitted (2) 29:13;125:21 persisted (1) 104:15 person (1) 259:19 personal (1) 198:19 personally (2) 123:24;126:24 personnel (1) 159:20 perspective (2) 52:21;110:2 pertaining (1) 155:10 pertinent (1) 50:20 PEST (10) 67:2,3,4,9;68:6;69:3;77:3, 15;78:7;80:11 Pete (1) 264:18 PH-GW (1) 10:17 Phillips-head (1) 169:23 phone (2) 111:21;195:20 photo (1) 208:15 photograph (1) 96:6 phrase (1) 98:7</p>
P			
<p>package (9) 106:15;107:3,5;162:3; 202:5,6,13,14,19 page (69) 17:7;20:2;21:12;22:4; 23:11,21;24:1,4,5,22;25:19, 23;26:4,16,28;16:30;13; 32:12;35:10,20;38:18;42:10; 43:15;45:4;46:17;48:4;54:6; 55:11;57:15;65:3;68:19; 70:15;71:15;72:17;75:2,8; 76:19;77:8;80:23;93:6,6; 94:16;103:20,23,24;104:3; 114:8;119:20;155:17; 157:10,11;162:17,19;164:14, 15,15;165:17;180:13,16; 188:4;189:25;190:5,6;192:5; 193:17;217:24;218:2,6,13; 231:17 pages (2) 218:10,14 Palisades (4) 232:14,17;233:6;234:16 paper (3) 24:16;170:7;175:24 paragraph (8) 22:7;23:13;30:14;43:16; 104:4;119:22;120:4;157:11 paragraphs (2) 17:21;26:17 parameter (1) 108:11 parameterize (1) 106:20 parameters (11)</p>			

<p>physical (4) 179:18;188:17;189:5,8</p> <p>physically (2) 49:23;240:4</p> <p>picks (1) 97:10</p> <p>picture (3) 35:16;36:17;167:10</p> <p>piece (3) 181:8;192:21,22</p> <p>pieces (1) 21:25</p> <p>pig (2) 176:22,22</p> <p>pillow (1) 231:9</p> <p>pipe (1) 178:13</p> <p>piping (1) 212:22</p> <p>place (17) 25:3,15;26:25;29:13; 125:24;133:23;134:4; 137:21;144:3,5;178:23; 181:12;208:23;209:7,11,18; 210:15</p> <p>places (4) 184:2;205:14;209:24; 210:14</p> <p>Plain (22) 12:2,5;13:7,8;31:17,18; 35:4;44:1;49:25;50:5;65:14; 73:3,10;106:10;178:10,20, 22;181:11;182:22;197:22; 214:7;223:19</p> <p>plan (15) 12:15;16:3;125:23; 132:15;134:10;137:1,7,8,12, 14,20,25;138:12,13;188:11</p> <p>planning (6) 20:24;136:10;146:21; 168:21;169:8;215:15</p> <p>plans (2) 133:9;166:18</p> <p>plants (1) 124:23</p> <p>played (1) 40:14</p> <p>please (34) 10:7;11:7;13:2;17:9; 42:10;62:18;65:6;93:7; 110:6;121:23;122:2,17; 146:13;149:15,19;150:6,16; 151:4;153:13,16,23;154:2; 155:14;158:25;162:21; 165:17;188:4,7,22;190:13; 192:5;228:5,13,19</p> <p>plenty (1) 241:20</p> <p>plotted (1) 208:9</p> <p>plow (1) 184:1</p>	<p>pm (1) 265:15</p> <p>point (29) 23:9;35:2;49:6;69:10; 84:14;92:20;93:21;96:11; 114:19;155:25;161:19; 182:24;189:11;201:23; 208:9,10;210:13,18;219:4,7; 236:4;240:24;241:3,18; 247:20;248:10;256:15; 257:15;262:22</p> <p>pointed (1) 170:18</p> <p>pointing (1) 43:23</p> <p>points (10) 42:1;164:7,8;176:1; 182:21,24;193:21;204:12, 15;208:18</p> <p>policy (10) 116:22,25;174:4,6,7,16; 176:6;187:4;192:10;204:20</p> <p>polygon (4) 32:24;33:3;208:13;209:6</p> <p>polygons (4) 33:12;199:12,12;208:17</p> <p>pool (30) 245:3,6,7,12,19;254:20,23; 255:7;257:11,11;258:25; 259:8,13,19,21,25;260:20, 23;262:14,14,17,19;263:3,4, 5,6,7,8,22;264:4</p> <p>pools (1) 264:7</p> <p>portion (2) 129:23;254:22</p> <p>portions (2) 261:7,19</p> <p>Portneuf (7) 201:19;229:25;232:15; 233:1,8,14;234:13</p> <p>position (7) 122:24;139:11,16,19; 194:20;229:7;233:19</p> <p>positioned (1) 104:18</p> <p>positions (1) 230:2</p> <p>positive (3) 204:10,17,18</p> <p>possibilities (1) 23:1</p> <p>possible (9) 97:1;99:5;148:8;154:12; 188:18;206:13,14;235:21; 264:19</p> <p>possibly (2) 140:17;156:21</p> <p>post (1) 37:18</p> <p>postcalibrated (1) 83:6</p> <p>postcalibration (4)</p>	<p>77:14,22;83:11,13</p> <p>potatoes (1) 125:13</p> <p>potential (7) 59:21;62:21;98:6;109:4,4; 201:21;250:2</p> <p>Potentially (9) 27:23;36:18;49:16;61:15; 62:5;76:25;88:11;94:13; 116:22</p> <p>power (1) 49:8</p> <p>PPU (1) 29:13</p> <p>practice (2) 37:11;256:23</p> <p>practices (4) 37:17,19,22;51:25</p> <p>precalibration (5) 77:13,21;83:5,11,13</p> <p>precautions (3) 169:11,12,16</p> <p>precipitated (1) 163:14</p> <p>precipitation (9) 38:5;41:18;44:16,17,18; 45:3,11;208:7;230:17</p> <p>precise (1) 191:12</p> <p>precision (16) 156:4;158:9;170:17,18,19; 172:14,18;173:13;174:18; 176:1;180:2;188:23;189:3, 13;192:20;220:24</p> <p>predict (8) 59:7;76:2;91:3,20;171:19, 25;172:2;177:4</p> <p>predicted (3) 44:3;75:20;235:17</p> <p>predicting (2) 73:19,21</p> <p>prediction (12) 68:15;76:2;84:14,24; 108:9;109:6;171:1;172:20; 174:9,19;177:9;201:12</p> <p>predictions (6) 59:3;74:19;75:6;107:16, 21;120:6</p> <p>predictive (2) 49:8;196:11</p> <p>predictor (8) 48:24;49:17,23;50:7,16, 24;91:14;102:23</p> <p>predictors (8) 46:20;47:1,10,13;48:13, 15,16;50:20</p> <p>predicts (2) 75:25;101:6</p> <p>preferred (2) 80:15;82:22</p> <p>preimposed (1) 80:9</p> <p>preliminary (6)</p>	<p>9:16;81:18;82:19;83:19; 84:6;212:13</p> <p>preparation (2) 13:13;155:1</p> <p>prepare (1) 194:21</p> <p>prepared (12) 63:18;69:19;104:13; 138:25;145:15;151:8;155:2, 4,8;170:9;182:3;246:16</p> <p>preparing (1) 158:16</p> <p>prescribed (1) 48:12</p> <p>presence (1) 104:25</p> <p>present (14) 23:20;34:4;90:23;91:19, 21;160:19,20;193:11;194:7; 196:3,25;200:25;204:25; 205:12</p> <p>presentation (5) 29:5;30:1;31:7;47:19;49:3</p> <p>presentations (3) 22:24;159:15,17</p> <p>presented (23) 17:18;18:9;27:7;28:9,11, 25;29:3;32:16;40:9;43:7; 54:21;60:9,19;73:10;100:9; 156:8;157:13;160:22;161:2, 6;193:13;212:11;214:6</p> <p>presenting (1) 57:19</p> <p>presently (2) 48:25;135:11</p> <p>president (2) 139:11,16</p> <p>pretty (8) 77:18;83:14;88:10; 104:19;119:6;132:11; 182:22;191:16</p> <p>prevent (1) 193:7</p> <p>previous (20) 18:13;39:17;40:23;42:4; 44:20;45:22;55:16,25;70:18; 96:23,24;97:3,7;101:4,4; 110:21;120:4;128:23; 133:24;147:11</p> <p>previously (9) 17:6;20:17;28:11;95:5; 96:9,25;152:13;187:10; 235:25</p> <p>primarily (2) 108:2;188:25</p> <p>primary (3) 155:7;169:7;189:4</p> <p>principal (1) 152:12</p> <p>principle (2) 221:6,7</p> <p>prior (14) 34:8;73:13;131:4;141:19,</p>
--	--	---	---

<p>25;155:6;168:4;194:6; 204:21;213:25;230:1; 253:22;259:6;264:23</p> <p>priorities (5) 126:2,5;239:8,13;240:3</p> <p>priority (14) 165:25;166:12,23,25; 224:6;226:18;234:7,8,21; 239:21,25;240:1;241:4,15</p> <p>private (7) 151:25;152:3,19;207:22; 209:15;255:15,18</p> <p>probability (1) 204:10</p> <p>probably (19) 50:7;51:24;52:6;74:8; 75:4;82:10;84:13;86:18; 96:2;130:24;152:18;156:22; 193:23;199:24;211:12; 224:5;234:19;251:17;256:23</p> <p>problem (7) 108:18;156:24;157:1; 172:1;187:17;247:21;257:25</p> <p>problems (2) 172:3,4</p> <p>procedure (1) 259:22</p> <p>procedures (8) 245:6,14;254:20;255:6,8; 259:13;262:18,19</p> <p>proceed (1) 10:13</p> <p>proceeding (11) 18:21;20:20;112:10; 134:13;137:25;138:2; 152:14;153:9;155:9;170:25; 212:19</p> <p>proceedings (3) 18:13;138:4;152:16</p> <p>process (31) 25:15;26:25;27:5,11;28:3, 6;34:17,19;53:22;66:8; 67:10;68:7;69:7;79:4;118:2; 162:24;164:25;170:10; 173:9;175:22,22;195:1; 198:11;199:9,11,18,23,24; 207:17;241:7;260:21</p> <p>processed (1) 78:25</p> <p>processes (1) 167:11</p> <p>processing (21) 25:9;30:4;78:19,23;79:11, 18,19,23;80:8,21;81:16,19, 20,23,25;82:8,11,14;83:5,7; 93:18</p> <p>produce (5) 118:6,6;208:4;222:3;226:7</p> <p>produced (5) 56:6;82:3;85:6;160:16; 165:23</p> <p>product (1) 165:22</p>	<p>professional (5) 105:19;163:11;186:25; 188:9,11</p> <p>program (10) 133:20;183:20;208:14; 229:1,5,9;230:4;238:8,14; 247:1</p> <p>programs (4) 133:6;207:23,25;208:2</p> <p>project (18) 12:2,23;15:11;23:7;98:8, 23;106:7;113:1,3,5,16;114:3, 12,18,21;212:8,22,23</p> <p>projected (2) 53:15,16</p> <p>projects (6) 13:1;99:2;212:3,7,18,20</p> <p>propagate (2) 72:4;204:7</p> <p>propagated (1) 102:9</p> <p>proper (2) 202:6,8</p> <p>properties (10) 66:2;67:10;68:3,5;71:22, 23;72:6,7,12;82:17</p> <p>proportion (1) 148:11</p> <p>proportionate (2) 85:13;129:25</p> <p>proposed (8) 73:2,6,9;76:25;79:17,24; 81:4;265:4</p> <p>proposing (1) 45:13</p> <p>protect (4) 100:14,19;116:16;256:1</p> <p>protection (9) 37:5,7;40:19;41:23;43:13; 57:9;97:12,13,14</p> <p>protective (3) 41:22;59:13;183:5</p> <p>provide (15) 26:9;113:17;170:3; 173:20;174:23;175:15; 176:8,13;181:9;182:1;184:5; 193:1;221:9;255:10;259:10</p> <p>provided (17) 18:16;20:5,8;55:23;56:19; 92:12;116:3;153:11;155:11; 156:3;157:3;161:22;185:2; 191:2;213:21;226:9;258:25</p> <p>provides (2) 181:22;224:22</p> <p>providing (2) 37:5;159:14</p> <p>proximity (1) 208:11</p> <p>prudent (1) 189:21</p> <p>published (2) 246:20;247:23</p> <p>pull (1)</p>	<p>221:11</p> <p>pulled (3) 15:25;38:9;55:18</p> <p>pulling (1) 57:17</p> <p>pump (2) 127:12,13</p> <p>pumper (1) 88:19</p> <p>pumpers (2) 109:15;110:11</p> <p>pumping (12) 72:4;85:10;91:4;110:16; 147:9,10;148:14;178:21; 183:13;222:23;223:4,22</p> <p>pumps (5) 141:14,14;147:24;247:3, 13</p> <p>purchased (1) 260:10</p> <p>purely (2) 95:21;256:5</p> <p>purged (1) 204:23</p> <p>purpose (14) 100:2,11,16,18;101:8; 158:6;168:19;169:1,19; 190:13;216:11;223:9;225:5; 260:2</p> <p>purposes (12) 154:9;169:7,22;195:1; 199:1;211:18;245:20; 258:17,19;259:21;260:1,18</p> <p>pursuant (2) 132:15;134:11</p> <p>pursuing (1) 200:4</p> <p>put (15) 15:21;27:4;46:8;55:14; 67:21;77:18;106:25;121:20; 125:24;133:23;143:4; 176:21;189:17;214:24; 261:21</p> <p>puts (1) 108:24</p>	<p>50:7</p> <p>quick (2) 194:5;249:14</p> <p>quickly (5) 11:15;66:5;71:25;155:16; 205:13</p> <p>quite (5) 52:23;65:18;140:20; 180:10;199:4</p> <p>quote (5) 39:4;50:12;64:19;215:14; 220:20</p>
R			
			<p>R16 (1) 157:12</p> <p>R17 (2) 190:4,8</p> <p>R18 (2) 190:5,8</p> <p>R19 (4) 190:9,9;191:13,20</p> <p>R2 (1) 51:3</p> <p>R21 (1) 190:10</p> <p>R7 (3) 165:18,21,22</p> <p>rain (1) 236:5</p> <p>rains (1) 234:23</p> <p>raise (8) 10:15;45:25;63:8;102:12; 122:2;149:23;212:9;228:4</p> <p>raised (5) 73:23;74:20;103:11,11; 199:25</p> <p>Ralston (3) 69:18;70:16;104:12</p> <p>ran (2) 73:16,16</p> <p>range (7) 116:5,9,11;126:5;175:6; 217:14;218:16</p> <p>ranked (1) 170:11</p> <p>Rangen (6) 12:7,11;90:15;101:19; 109:11;155:9</p> <p>ranges (1) 67:5</p> <p>rapidly (1) 204:7</p> <p>RASA (1) 106:7</p> <p>rate (7) 35:18;56:24,25;82:3; 127:17,18;163:8</p> <p>rate-per-acre (1) 248:21</p> <p>rates (2)</p>
Q			
		<p>qualifications (1) 150:23</p> <p>qualitative (1) 203:10</p> <p>qualitatively (3) 160:11,17;162:1</p> <p>quantify (1) 198:11</p> <p>quantity (2) 226:15;231:10</p> <p>quarter (5) 64:8;111:11,14;209:1,1</p> <p>quarter-million (1) 221:16</p> <p>questionable (1)</p>	

56:21;250:4 rather (1) 205:14 ratio (6) 85:23;156:3;178:2;179:17, 17;220:20 ratios (3) 177:16,18;179:15 reach (71) 49:24;50:2,3,21;53:1;56:7; 66:22,22;67:22,23,25;68:15, 18,23;69:13;70:6,14;71:3,5, 8;72:5;75:7,7,19,21;76:6,13; 77:12;84:25;85:11;86:1,3,8, 17;91:6,8,16,17,25;104:2,23; 105:6,22;107:10,11,14,17, 21;108:4,18,22;109:10; 115:7;119:24;148:19;163:9; 171:3,3,11;173:16;178:22; 190:24;216:25;217:1,4; 219:23;239:17,24;240:18; 241:3,16 reached (2) 148:20;241:12 reaches (15) 102:9;165:4;186:23; 214:17;216:20,22;217:7,9, 15;218:10,17;219:12; 229:13;240:10;241:22 reaches' (1) 217:13 reaching (1) 240:4 reaction (3) 163:11;186:25;188:9 read (12) 33:7;72:19;162:20;164:21, 22;166:11;167:2;180:20,24; 187:14;223:2;242:23 read] (2) 55:4;103:24 reading (2) 87:6;177:21 reads (3) 17:22;22:9;30:14 ready (4) 9:4,13;164:16;185:13 real (1) 36:13 reality (3) 66:11;68:12;178:6 realization (1) 196:11 realized (4) 163:5;165:6;188:24;225:1 reallocate (1) 148:18 really (35) 19:10;42:22;43:13;48:11; 50:17;51:22;52:13;53:21,22, 25;54:21;57:9;58:21;63:1; 73:18,18;74:18,18;75:13; 78:9;79:6;80:14;82:25;86:1;	95:11;106:11;114:19; 120:21;148:22;168:24; 170:7;175:17;179:19;257:8, 16 real-time (5) 28:25;30:3,4;36:17;58:12 reask (1) 136:5 reason (19) 28:7;39:16;50:17;73:7; 78:22;79:6;83:22;94:6; 141:3;159:3;177:6;183:17; 199:23;225:23;251:14; 252:1,6;254:19;256:20 reasonable (50) 15:8;17:15,19;18:7,16,17, 22;19:1,4;20:4,7,12,21;21:6; 22:1;23:2;30:8,12;31:9; 36:14,23;45:20;53:7,10; 54:1,3;57:21,24;58:8;59:15, 25;60:6,20;99:16,18;100:1,2, 8,11,23,24;101:2;102:14; 113:14;114:10;206:6;213:8, 18,19,23 reasoning (4) 39:8;155:23,24;156:10 reasons (12) 46:6;69:8;103:6;155:20, 22;157:2;161:16,18,20,20; 220:14;224:2 reassess (1) 50:13 rebuttal (2) 193:21;194:5 recalculate (2) 113:11;114:14 recalculated (1) 114:8 recalibration (3) 68:20;82:13,19 recall (34) 21:2;22:15,24;23:16; 25:11;50:10;90:16;92:6,14, 22;98:5,10;99:20;101:16; 119:8;120:15;142:9;145:20; 146:17;186:19;194:12; 196:6,7;197:3;198:16;201:5; 207:12,14;211:14;225:13; 245:4;258:18,21;261:8 receive (9) 115:20;137:18;140:21; 238:14;245:10,11,15,19; 260:6 received (12) 87:12,13;142:16;149:6,7; 206:21,22;234:23;236:15, 16;252:17,18 receives (1) 101:9 receiving (2) 221:18;252:14 recent (8) 17:25;58:10;94:8;118:3;	190:22;192:13;255:6;257:10 recently (3) 147:16;254:20;258:24 recess (1) 111:17 recharge (28) 12:13;16:3;43:25;44:6,10; 61:12;62:2;67:14;73:22; 77:12,12,17,23;78:2;80:11; 83:17;98:15,19,22;101:21; 102:1,4,6,9,15,17,24;264:9 recharged (1) 61:21 Reclamation (2) 230:7;235:25 recognition (2) 221:6,7 recognize (4) 21:17;109:5;129:14;247:5 recognized (2) 24:19;251:5 recognizing (1) 250:1 recollection (1) 161:14 recommend (3) 22:13;25:1;192:2 recommendation (11) 22:3;25:3;26:6;46:15; 48:21;81:1,4;82:11;108:21, 23;175:10 recommendations (13) 21:3,22;23:22;52:9;79:16; 81:11,14;92:13,21,24; 151:16;176:17;212:24 recommended (2) 26:11;219:2 recommending (4) 21:4,23;24:24;27:4 record (38) 9:5;16:20,24;33:7;38:24; 39:15;40:5;44:16;45:19; 51:9;56:21;61:3;64:10;87:7; 89:11,14,16;117:8;122:18; 129:16;148:23;149:1; 150:12,17;152:22;157:7; 160:20;188:2;227:22; 228:20;231:16,17;236:10; 246:14;247:20;249:16,23; 251:7 recorded (2) 29:14;223:2 recording (4) 16:25;89:17;111:16;194:2 records (2) 55:6;229:10 recover (1) 142:23 re-create (1) 70:9 Recross (3) 119:11;262:11;264:11 recross-exam (1)	227:19 Recross-Examination (2) 7:11;263:1 recurring (1) 203:1 Redirect (15) 7:10;111:5,6;117:5,11; 144:11,13;206:25;226:25; 227:3;257:5,9,12;261:1,3 redo (1) 114:20 reduce (2) 42:20;260:3 reduced (4) 41:19;59:4,5;202:1 reducing (2) 59:13,19 reduction (11) 62:13;72:3;76:5;85:10; 103:19;125:25;131:14; 148:11;181:12,13;236:2 reductions (2) 131:20;142:8 reevaluated (1) 52:6 reevaluating (1) 23:6 refer (10) 24:1;26:17;51:14;157:10; 164:11;169:10;177:16; 182:8;240:6,11 reference (4) 93:1;149:1;168:4;232:5 referenced (2) 212:19;221:19 references (3) 30:20,24;181:25 referencing (2) 20:19;69:17 referred (11) 18:5,20;20:17;26:18; 113:20;152:23;159:24; 169:11;176:1;216:17;263:3 referring (18) 14:14;17:17;18:4;23:19; 31:1;69:16;71:21;75:2; 97:24;98:11;104:14;116:5, 10;148:23;221:13;223:18; 240:7,19 refers (2) 17:10;58:21 refine (2) 179:17;182:19 refined (1) 83:5 refining (1) 182:11 reflect (2) 224:12;248:1 reflected (4) 24:22;54:4;120:19;247:15 reflection (1) 107:24
--	--	---	---

<p>reflects (1) 220:13</p> <p>reformulate (1) 176:4</p> <p>reformulating (1) 176:5</p> <p>regard (8) 158:2,3;160:9;161:21; 189:13;193:4;202:24;204:21</p> <p>regarding (14) 22:13;93:5;98:4,5;100:22; 101:13,21;110:3;154:10; 155:20;158:7,9;159:18; 188:10</p> <p>regardless (1) 138:21</p> <p>region (2) 104:2;107:2</p> <p>regional (4) 52:1;106:8;107:7;219:24</p> <p>regression (4) 47:18,24;52:15;174:1</p> <p>regressions (1) 47:22</p> <p>regular (1) 122:1</p> <p>regularly (1) 254:17</p> <p>regulate (2) 127:7,14</p> <p>regulated (1) 263:23</p> <p>regulating (1) 241:1</p> <p>regulation (1) 260:3</p> <p>regulatory (1) 204:17</p> <p>relate (3) 98:23;190:14,18</p> <p>related (15) 12:9,10;15:4;17:19;26:11; 37:22;56:20;76:23;101:3; 118:18;152:1,20;155:5; 159:1;203:4</p> <p>relates (3) 58:19;66:5;71:12</p> <p>relating (8) 10:19;84:21;122:6;150:3; 154:23;192:22;225:10; 228:10</p> <p>relationship (3) 103:1;208:3;211:24</p> <p>relative (6) 93:2;94:25;96:23;202:11; 258:13,18</p> <p>release (2) 74:21;75:15</p> <p>released (1) 84:12</p> <p>relevant (4) 88:1;93:24;198:4;206:10</p> <p>reliable (4)</p>	<p>186:10;201:13;222:20; 224:3</p> <p>relied (1) 155:8</p> <p>relief (19) 156:3,4;174:20,23;176:9; 177:16,18;179:15;188:23; 191:23,24;193:1,2;196:14, 16;220:20;221:9,10;226:15</p> <p>relies (1) 214:13</p> <p>reluctance (1) 219:15</p> <p>rely (1) 228:3</p> <p>relying (1) 183:9</p> <p>remainder (1) 23:1</p> <p>remaining (1) 254:1</p> <p>remember (15) 22:17;59:16,19;106:8; 116:2;138:8;145:3;146:12, 15;217:16;227:7;259:1; 261:12,15,18</p> <p>remembered (2) 78:25;79:5</p> <p>remote (4) 27:7;32:21;121:12;199:19</p> <p>remotely (3) 10:10,19;228:11</p> <p>removed (4) 27:12;29:20;179:7;214:25</p> <p>removing (1) 27:1</p> <p>renew (1) 137:23</p> <p>rent (7) 238:14;254:17;255:5; 259:20;263:18,22;264:3</p> <p>rental (16) 245:2,6,7,19;254:20; 255:11;258:25;259:13; 260:11,20;262:14,17,19; 263:4,8;264:6</p> <p>rentals (9) 237:16;238:7;257:10; 259:8,9,12,14,18;260:23</p> <p>renting (3) 238:11;254:14;255:3</p> <p>repeat (4) 98:17;110:7;222:11; 225:16</p> <p>rephrase (2) 131:12;185:19</p> <p>replacement (1) 219:16</p> <p>replicate (1) 225:20</p> <p>replied (1) 117:16</p> <p>report (104)</p>	<p>14:5,11,22;15:2,7,9,15,21; 16:7;17:7,21;21:10,11,14; 22:5;24:3,4,22;25:19,21; 26:19;28:14;29:22;30:14,20; 32:6;34:20;37:15;38:7,10, 18;42:11;43:16;44:8;51:13; 64:3,19;65:3;68:19;69:12, 17;70:16,17;71:16;93:6; 95:4;100:4,25;103:21,23; 104:13;108:16,25;109:3,19, 25;112:13;113:13;129:18; 149:4;153:8,11,25;154:1,3; 155:1,11,12,15;157:3,7,12, 17;159:21,24,24;160:12; 161:22;163:15,20;165:17; 169:10;177:15;181:21; 184:12;186:13;190:19; 192:6,8;193:6,18;204:24; 205:11;206:17;208:25; 215:13;217:11;222:19; 224:16,21;246:3,9,15;261:6</p> <p>reported (3) 58:11;61:20;223:2</p> <p>REPORTER (20) 9:6;33:5,7,10;64:11;78:15; 98:17,21;116:8;153:15; 185:14;190:17;222:11; 224:13;242:19,21,22;243:5, 10;249:19</p> <p>reporting (2) 61:25;134:3</p> <p>reports (6) 13:17;30:19;98:2;168:22; 171:8;181:25</p> <p>represent (13) 43:18;66:11;77:20; 105:16;106:1,20;112:7; 129:17;132:21;150:13; 166:2;216:15;246:8</p> <p>representation (12) 51:21;106:16;131:25; 176:24;202:6,8,15;208:5,7; 218:24;220:7;228:4</p> <p>representative (7) 51:23,24;119:23;120:2,7; 193:14,16</p> <p>represented (9) 18:13;28:5;70:9;107:11; 215:3;218:16;247:11; 250:20;252:4</p> <p>representing (5) 105:21;106:19;140:9; 153:5;202:20</p> <p>represents (5) 124:15;165:23;190:25; 248:3;251:17</p> <p>reproduced (1) 190:8</p> <p>requested (1) 143:7</p> <p>requesting (1) 80:6</p> <p>require (1)</p>	<p>147:18</p> <p>required (5) 133:21;175:13;193:2; 201:15;221:9</p> <p>requirement (2) 139:20;188:13</p> <p>requirements (1) 238:3</p> <p>requires (2) 97:20;178:7</p> <p>resampling (1) 68:20</p> <p>Research (1) 155:3</p> <p>reserve (1) 206:24</p> <p>Reservoir (12) 52:1;104:18;105:6;107:4; 112:8;140:24;141:5;229:14, 23;234:20;237:15;238:2</p> <p>reservoirs (8) 100:16;141:1;229:24; 234:7;235:9,10;254:2,4</p> <p>resistance (1) 72:21</p> <p>resolved (1) 135:14</p> <p>Resource (2) 101:25;109:2</p> <p>Resources (6) 151:12,16;152:2;155:3; 177:24;178:1</p> <p>respect (14) 93:22;98:3;99:25;100:11; 101:7;102:1,6,13;103:11; 107:9,11;109:14;141:13; 143:25</p> <p>respectively (1) 40:18</p> <p>respond (1) 103:3</p> <p>responded (1) 103:5</p> <p>response (25) 25:20;75:15,18,21;76:9; 84:9;85:24;86:7,14;102:24; 108:18;109:10,12;116:14; 156:6;170:16;172:7,11; 188:11,11;189:19;191:18; 214:22;219:22;258:15</p> <p>responses (9) 50:4;73:21;75:6;76:5; 91:3;190:24;220:7;224:22; 225:1</p> <p>responsibility (9) 158:3;166:17;167:1,3,5; 187:12;198:23,25;226:4</p> <p>responsible (7) 109:16;110:11;126:12; 156:20;159:3;241:1;254:22</p> <p>restate (2) 146:13,16</p> <p>restricting (1)</p>
---	--	--	---

<p>249:8 restrictions (1) 262:15 result (17) 56:16;62:23;76:11;92:14; 156:19;166:2,5,8;170:24; 187:3;196:11;202:2;217:17; 220:14;233:21;236:2;255:23 resulted (4) 33:21;79:10;99:18;259:10 resulting (4) 74:24;163:3;165:5;214:23 results (14) 69:4;76:17;77:3;79:13; 160:16;170:18;176:8;191:1, 2,3;218:12;220:1;225:7,24 retained (3) 90:10;164:22;211:25 return (9) 49:21;197:4,8,11,11,18,21; 198:8;261:20 returns (2) 197:10;198:11 revealed (1) 161:17 revelation (1) 129:5 reversed (1) 201:24 reverted (1) 28:7 review (15) 13:15;17:25;27:4;28:6; 38:21;40:8;50:18;73:11; 106:5;153:2;154:9,18,21,22; 167:22 reviewed (10) 30:8;61:10;77:2;82:8; 97:25;115:24;157:23,24; 172:23;220:4 reviewing (2) 61:18;158:15 revise (1) 244:16 Rexburg (2) 218:19;240:16 RICHARD (2) 122:4,19 riders (1) 132:24 Rift (1) 109:12 right (74) 9:15,24;10:15,23;12:8,10, 22;19:14;24:12,13,23,23; 33:22;34:15;38:11;55:5; 69:2,8,9;77:19;82:16;83:25; 89:8;92:18;104:4;107:3; 110:16;111:3,11;121:8,24; 122:2;123:18,19;126:2,6; 127:16;134:17;138:11; 146:8,11;149:18,23;152:19; 162:16;166:1;177:5;180:4;</p>	<p>183:6;184:11;185:16;195:9, 15;206:24;208:25;209:4,5, 13,16;210:11,14;220:14,14; 227:21,22;228:4;232:12,15; 246:25;248:3;256:20;258:1; 264:12;265:9 rights (35) 52:25;65:5;75:16;109:17; 110:12;125:1;126:7,8,25; 127:2,5,8;130:25;133:7,8; 141:13;144:1,3;151:25; 160:4;170:14;175:25; 208:21;209:11,23,25; 216:15;229:15;233:24; 234:18,20;237:15,24; 239:11;240:1 Rimrock (1) 49:21 Ririe (1) 230:20 RISD (7) 17:25;19:6,8,20;20:25; 22:11;57:13 River (68) 91:7;105:22;106:15;107:3, 4,5;144:20;151:17,22;159:8; 163:2;164:3,8;165:5;172:9; 189:7;195:9;202:5,6,7,9,13, 14,16,17,19;213:8;214:16, 23;215:1,2;218:10;220:7; 224:23,25;229:13,19,20; 230:23;232:3,10,16,17; 233:17;237:13,20;238:2,19, 21,25;239:6,12,14,18,22,24; 240:4,9;241:3,5,12,23;242:3, 4,8;254:10;260:3;261:21 road (2) 204:23;249:1 roads (1) 27:12 Rob's (1) 257:20 robust (7) 182:22;183:3;199:10; 200:6,17;201:25;203:5 Rocky (3) 152:7,8;190:11 Roger (1) 175:25 role (1) 159:14 room (2) 194:8;196:4 roughly (3) 47:15,16;126:6 round (1) 178:8 row (2) 130:5;191:20 R-squared (22) 49:5,7;102:13;103:1; 171:8,13,15;172:21;173:2,4, 7,11;174:1;176:14,19;201:6,</p>	<p>11;217:8;218:11;219:3,12; 220:12 rule (1) 259:22 ruled (1) 110:13 rules (6) 110:14;177:22;216:3; 257:1;262:14;263:4 rulings (1) 110:21 run (8) 56:6;99:7;115:5,18;166:7; 225:24;226:7;241:9 running (3) 80:3;91:14;191:7 runoff (7) 233:22,25;234:11,15,17; 235:24;254:4 runs (3) 80:5;225:16;226:1 S safe (7) 137:9,14,18,21;138:13,15, 20 salmon (1) 263:10 same (32) 19:20;20:7;26:13;29:24; 31:7;48:10;69:22,23;74:15; 77:20;82:17;84:3;113:24,25; 115:19;128:12;156:8;163:7, 8;166:3;167:21;169:8;195:1, 2;197:19;198:3;226:8; 230:18;231:24;232:24; 256:22;259:17 sampling (1) 182:21 Sarah (5) 9:8,9;195:24;264:17;265:2 satellite (2) 96:3;200:2 satisfaction (1) 137:3 saw (11) 32:6;47:19;63:16;77:1; 78:3,3,4;82:2;94:15;108:19; 142:4 saying (8) 47:9;73:24;99:5;117:14, 18;120:7;203:22;222:9 scale (2) 189:2,2 scenario (2) 256:4,16 scenarios (1) 159:9 school (1) 228:24 science (17) 11:18;90:24;91:1,2;</p>	<p>170:24;171:22,23;174:14; 175:3,5,9;190:22;191:10; 192:14;229:1,3,3 sciences (1) 171:5 scientific (1) 175:6 scientist (1) 175:10 scope (5) 109:19,24;134:12;212:10; 248:23 score (1) 199:20 scoring (1) 199:18 screw (1) 169:23 season (27) 23:2;37:4;38:4,6;41:17; 44:15;53:13;85:19;91:19,21, 25;93:2;97:16;100:15; 116:21;127:19;134:5;168:2; 196:12,17;222:24;226:8; 229:16;253:23;254:1; 256:10;259:7 seated (2) 150:7;228:14 second (14) 11:11;17:22;19:14;29:19; 55:20;119:21;157:10;158:5; 163:15;170:8;183:25; 192:22;203:9;217:24 Section (30) 23:13;24:11;25:6;34:20; 35:20;48:23;55:2;58:17; 59:24;61:7;64:3,16;65:4,10; 67:16;69:17;71:12,15,19,21; 72:15;73:8;84:17,18,19; 87:5;103:22;104:5;119:21; 130:8 sector (2) 151:25;152:4 secure (1) 177:25 sediments (1) 106:17 seed (4) 125:14;194:23,25;195:3 seeing (8) 73:18,25,25;74:11;75:5; 80:3,4,7 seeking (1) 221:9 seem (3) 80:11;114:2,16 seemed (4) 46:8;48:10,14;63:19 seemingly (1) 63:3 seems (14) 18:11;28:7;36:17;38:21; 44:21;51:10;52:21;78:7;</p>
---	--	---	---

114:11;116:22;174:2; 188:12;233:10;236:4 seeps (1) 242:7 select (3) 97:1;261:7,19 selected (5) 40:10;46:23;53:23;96:24, 25 selecting (1) 44:21 selection (4) 36:25;38:24;57:6;101:1 self-reported (1) 117:23 semi-irrigated (11) 33:19,20,23;95:18,19; 118:9,12,15,19;119:4,7 send (2) 131:13;148:13 sends (1) 126:10 senior (15) 37:6;40:19;41:22;43:4; 59:5;97:11;109:16;110:12, 16;126:7;183:6;234:8,21; 239:25;256:19 seniors (1) 116:16 sense (3) 36:15;118:10;241:2 sensing (3) 27:7;32:21;199:19 sensitivity (4) 79:18,23;80:6,20 sentence (3) 17:22;30:14;120:17 Sentinel (4) 48:19;51:18,20;73:20 separate (4) 105:11;108:8;137:25; 148:25 September (7) 44:17;73:6;81:6,6;115:11; 130:17;225:11 series (5) 21:21;28:23;37:9;55:23; 190:5 serious (2) 221:16,17 serve (1) 124:5 served (1) 151:7 service (9) 185:12;209:24;247:25; 249:25;250:1,7,7;251:16,21 Services (2) 69:18;213:1 serving (1) 123:1 set (10) 67:4;126:1,1,2;133:22; 170:21;173:20;174:5,12; 203:14 sets (2) 66:14;128:16 settled (1) 239:10 settlement (8) 12:15;61:25;135:3,8; 136:11;145:18;146:18; 147:14 several (3) 16:3;46:15;182:11 severe (1) 204:18 severely (1) 214:18 Shapefile (12) 29:12,14,17;94:22;95:1, 10;208:13;209:4,6,9,12; 210:4 shapefiles (6) 27:2;36:7;93:13;208:17; 209:25;210:5 share (9) 85:13;129:25;137:1; 139:14;147:8,9,24;148:15; 243:16 shared (1) 139:23 sheet (10) 18:19;19:2;20:5,8;30:9; 58:9;113:15;114:11,17,23 Shelley (2) 218:19,20 shift (9) 40:22;41:12;49:17;57:7; 61:1;84:11;186:12,14; 200:21 shifting (1) 43:21 shooting (2) 175:18,21 short (10) 55:7;105:22;117:9;171:5; 219:13,14;221:15,24; 227:19;265:6 shortage (3) 88:23;115:15;139:12 shortcomings (1) 197:14 shortfall (47) 27:25;41:19;42:18,22; 43:1,7,9,10;55:19,21;56:3,8, 11,12;57:14,20,21,23;58:13, 25;59:21;60:6,11,20,24; 61:4;65:9;113:21,25;114:5, 6,9;115:20;116:20;178:5; 179:10;183:24;196:12; 197:8,12,21;198:9,13; 201:14;202:2;226:8,19 shortfalls (3) 54:2;114:13;169:14 short-sighted (1) 189:19 short-term (8) 167:14,18;170:25;171:9, 10;172:3,6;173:18 Shoshone (1) 124:14 show (20) 29:9;35:16;37:15;38:11, 13;45:17;47:23;48:5;54:24; 60:4;85:19;121:18;139:5; 164:5,5,6;166:6;191:4; 218:10;225:5 showed (6) 47:19;48:2;49:4;56:1; 84:9;225:4 showing (16) 31:11;48:15;55:14;58:12; 60:10,14;72:19,20,22;73:4; 77:10;82:15;96:6;200:3; 209:9,10 shown (13) 21:1;33:23,24,25;57:2; 70:22,24;83:3,5,7;94:18; 96:9;193:5 shows (29) 29:11;30:16;31:4,11; 46:18;54:7;56:1;60:11; 64:20;70:1,20;74:15;75:3, 15,18,20;76:16;85:21;99:11; 129:22,24;130:2,9;131:1; 148:17;165:21;166:3;173:7; 251:11 shut (2) 239:22;241:7 shuts (1) 241:2 shutting (1) 240:2 Side (9) 54:15;62:3;73:1;77:19; 82:16;127:6,14;140:21; 261:25 sides (1) 205:19 signed (3) 147:14,25;148:1 significance (1) 52:16 significant (9) 20:14;25:7;40:22;68:17; 70:12;83:24;84:1,4;103:19 significantly (3) 77:18;78:4;233:21 Sigstedt (27) 9:25;10:17;11:3,9;23:18; 33:5;78:15;87:16;89:19,23; 110:6;111:9,19,20;116:8; 119:16,20;121:8;129:18; 157:23;176:21;177:1,5; 189:15;201:11;211:21,24 Sigstedt's (2) 24:3;200:25 silent (1) 187:15 similar (8) 19:22;50:19;83:14; 108:19;191:4;215:22;220:1; 247:6 similarly (2) 54:15;118:13 simple (1) 178:8 simplification (1) 67:20 simplified (1) 66:11 simply (4) 68:21;146:1;231:8;247:17 Simpson (21) 89:9,10,18,22,24;98:22; 110:1,8,23;115:4;117:14; 119:11,12;132:6;140:4,7,8; 144:9,16;149:12;226:24 simulation (6) 43:8,9;65:4;72:2;163:1; 165:2 simultaneously (1) 190:16 single (7) 36:11;49:13;65:25;106:2; 185:11;204:11;220:5 single-event (1) 226:11 single-layer (8) 66:1;70:7;105:9,17,20; 176:22,22;202:20 sinking (1) 241:17 sinks (2) 241:23,25 sit (3) 87:19,20;149:21 sites (3) 230:15,25;231:6 sitting (1) 132:18 situation (2) 174:19;239:19 six (3) 148:1;192:14;262:19 sketches (1) 182:1 skim (2) 180:18;188:7 Skyler (1) 150:13 slow (3) 153:15,17,19 slowly (1) 71:25 small (19) 125:13;131:9,10;139:7; 178:25;217:18;220:4;255:7, 8,10,11;257:11;258:25; 259:14,19,21,25;260:2;263:7 smallest (1)

<p>33:1 Snake (60) 12:2,5;13:6,8;31:17,18; 35:4;44:1;49:24;50:5;65:14; 73:3,10;86:6;91:7;106:10; 123:12,25;124:11;130:5,6, 22;134:16;139:6;141:15; 142:13,20;143:11;144:1,20; 151:17,22;159:8,15;163:2; 164:3;165:5;170:2;176:17; 189:7;195:9;213:8;214:7; 223:14,19;229:19,20,23; 230:23;232:3,9,14,16,17; 233:6,17;237:12,20;238:2; 261:21 Snake's (2) 126:18;143:16 snapshot (2) 93:18;94:1 SNOTEL (2) 230:25;231:6 snow (13) 140:20;144:25;145:9; 230:14,15;231:8,9,10,11,13, 25;236:11;254:6 snowmelt (2) 254:5,9 snowpack (17) 98:12;128:22;140:12,18; 141:1,8;144:17,20;201:24, 24;202:1;230:24;231:7; 232:3;233:5,22;234:23 snowpacks (1) 140:15 sobering (1) 221:11 soil (1) 230:17 solid (3) 75:20;158:18;190:25 solved (1) 156:25 somebody (4) 195:19;213:2;228:6; 245:18 somehow (1) 95:7 someone (3) 175:16;212:23;260:10 someone's (1) 175:19 someplace (1) 189:7 sometimes (7) 29:14;195:15;204:11; 235:25;241:9;247:9,10 somewhat (4) 186:16;189:10;237:25; 247:8 somewhere (4) 132:24,25;178:10;197:22 soon (2) 169:5;249:3</p>	<p>sooner (1) 225:1 Sophia (28) 9:25;10:9,15,17;11:4,9; 17:3;21:13;47:4;64:15; 87:24;90:2,4,92:3;101:7,18; 103:20;107:15;117:13; 121:4;129:18;173:1;176:16; 180:9;200:23;201:3;202:5; 220:13 Sophia's (2) 149:4;201:18 sorry (21) 11:10;23:24;24:14,16,18; 25:23;47:7,8;58:20,23; 62:18;78:15;98:17;109:21; 116:8;166:20;190:20; 224:14;242:22;246:1;248:16 sort (17) 15:1;18:8;37:4;40:20; 51:22,24;59:20;68:24;72:21; 79:1;81:18;84:14;159:22; 210:3;212:7;224:3;231:20 sound (1) 123:18 sounds (3) 116:18;123:19;161:15 source (12) 62:11,13,20;63:15,20; 81:20;82:1,4;154:13;182:4; 195:6;253:17 sources (7) 35:2;61:8;82:2;96:2; 159:5,6;199:19 South (2) 122:19;234:12 southwest (2) 105:3;123:21 space (12) 235:3,9,10,17,19;236:3; 245:6;254:21;259:10,15,16; 260:20 Spackman (1) 21:15 spatial (4) 208:3,3,5,7 spatially (2) 193:14,16 speak (6) 109:22;121:2;156:9; 167:11;175:6;198:14 Speaking (2) 190:16;249:20 speaks (1) 181:22 specialists (1) 82:7 specialty (1) 125:14 specific (11) 37:12,16;52:15;101:1; 108:16;159:24;176:4; 179:13;216:20;219:21;</p>	<p>258:21 specifically (11) 46:6;56:9;90:10;94:23; 96:12;107:20;166:17; 190:23;195:14;258:11; 259:25 specification (1) 166:15 specifics (1) 218:23 specified (2) 168:10;187:22 specifies (1) 166:11 specify (4) 105:1;145:23;147:5; 172:14 spell (2) 150:16;228:19 spent (3) 15:10;182:10;228:25 SPF (5) 18:11;19:14;20:17;30:20; 95:4 spill (1) 235:22 splits (2) 85:8,9 spoke (1) 157:5 spoon-fed (1) 177:7 spot (1) 199:25 spread (1) 259:13 spreadsheet (6) 18:1,17,22;61:11,19;130:9 spring (9) 66:22,23;95:25;96:7,7; 102:24;119:23;234:23;242:8 springs (7) 105:7;165:5;172:9;215:2; 217:4;242:2,5 Spronk (2) 19:15;20:18 stabilize (3) 51:3;131:22;142:9 stabilizing (1) 142:19 staff (16) 13:21;14:13;17:12;20:23; 21:3,13,22;22:18,21;23:22; 24:24;26:7;28:20;36:9; 55:13;92:13 staff's (1) 18:6 stand (2) 134:25;149:21 standard (11) 27:14;44:19;52:17;59:5,9; 75:13;103:7,18;175:3,5; 203:13</p>	<p>standing (1) 228:4 standpoint (1) 39:1 stands (1) 106:23 start (6) 9:4;32:21;40:21;81:12; 241:13;264:15 started (13) 12:3,7;34:6,7,24;35:7; 90:13;204:23;211:15;254:4, 5,7,9 starting (16) 19:1;30:10;32:3,9;34:12; 40:20;42:17;56:22;59:20; 194:20;210:13,17;218:13; 219:4,6;244:20 starts (3) 29:11;37:4;43:10 state (65) 43:17;55:4;76:9,14;91:11; 103:24;110:14;115:1,3,18; 116:14;122:17;128:1,1,4,8; 130:1,4;139:5;143:6,13,17, 23;148:6,17;150:16;154:17; 158:4;161:6,12;162:2,23; 163:9,18,21;164:4,5,24; 165:13;166:2,5,8,10,15,19, 21;167:1,7,14,24;168:4,7,14; 177:25;187:11,22;192:9; 196:7,8,10,18;225:11;226:7; 229:2;256:18 stated (7) 153:4;167:23;168:3; 181:16;187:10;215:18,20 statement (12) 38:25;50:14;55:8,9; 101:11;120:4;161:3;163:22; 170:3;181:19;201:18;258:13 statements (2) 170:7,9 states (5) 120:6;132:23;138:13; 230:7,8 state's (1) 177:24 stating (1) 107:20 station (1) 230:19 stations (1) 35:2 statistic (3) 171:8;172:22;177:4 statistical (1) 203:7 statistically (1) 182:21 statistics (1) 172:23 stay (3) 21:11;26:3;126:12</p>
---	--	--	---

steady (47) 76:9,14;91:11;115:1,3,18; 116:14;128:1,8;130:1;143:5, 13,17,23;154:17;158:4; 161:5,12;162:1;163:9,18,21; 164:4,5;165:12;166:2,4,8,9, 15,19,21;167:1,7,14,24; 168:4,6,14;187:11,21;196:7, 8,10,18;225:11;226:7	stress (3) 76:12;205:25;206:4	sufficiency (1) 199:7	supposed (2) 31:9;38:16
steady-state (6) 162:23;163:1,5;164:24; 165:2,7	stressed (1) 76:11	sufficient (2) 180:23;185:23	surcharge (1) 127:13
stem (6) 229:21;239:17,22;240:19, 20;242:2	stresses (2) 91:4,6	Sugar (3) 124:24;125:13;240:16	sure (24) 34:7;37:18;38:3,21;66:9; 69:16;74:23;87:25;88:6; 96:16;104:10;111:5;119:6; 121:5;128:9;134:24;136:22; 137:3;144:22;145:7;157:13; 158:19;257:16;258:21
stemming (1) 68:21	strike (2) 13:1;99:14	suggesting (1) 222:13	Surface (94) 25:14,16;27:15;29:15; 36:7;37:2,6,23;39:3,11;40:1, 11,19;41:6;43:22;45:21; 46:14;51:25;53:2,11,12,24; 59:9;61:15;62:1,22;63:2; 68:16;88:24;92:7;95:13; 103:8;109:17;110:12,16; 125:23;127:2,4,5,8,15;131:5, 21;135:2,7,17;141:8;143:21; 146:19;151:7;169:13; 171:20;174:21;178:4,6; 179:10;181:9,9;183:15; 189:20;191:24;197:15; 200:19;201:15,22;203:18; 211:1,19;221:14;222:3,8,14, 14;223:16;226:16;227:20; 232:7;234:2;235:3;236:20; 238:10;240:19;243:21; 245:9;248:25;253:14,16; 254:14,16;255:4,9,17;256:5; 260:5
step (1) 205:24	striving (1) 177:12	suggestion (1) 136:24	surfaces (1) 27:12
Stephanie (1) 123:1	strongly (1) 39:8	suggestions (4) 176:13;223:21,24,24	surface-water (1) 256:16
stepped (1) 160:23	struck (2) 147:13;164:21	suitability (1) 169:19	surprise (4) 129:1;130:19;187:2;210:8
stepwise (1) 52:14	structural (2) 74:1;176:23	suite (1) 199:12	surprised (1) 140:16
stick (1) 261:16	structure (3) 65:22,25;66:10	Sukow (3) 43:6;55:23;161:10	surprising (1) 187:6
still (19) 22:5;28:15;95:6;108:11; 114:4;125:13;134:9;136:25; 139:1;152:3;167:19;169:8, 21;174:2;211:23;213:1; 239:23;241:12;245:19	studies (1) 106:7	Sukow's (2) 115:24;196:4	survey (1) 230:15
stinking (1) 200:2	stuff (1) 89:11	Sullivan (4) 157:23;173:1;181:16; 188:1	surveys (1) 195:5
stippled (2) 70:23,25	sub (1) 23:13	summarize (5) 42:1;48:7;169:15;177:17; 192:8	sustain (1) 201:14
stipulated (1) 150:22	subbasins (1) 231:25	summarizes (1) 22:7	Swank (1) 246:16
stopped (2) 248:11;251:25	subcontract (2) 151:21;195:8	summary (7) 16:9;17:18;28:16;29:2; 49:19;87:5;93:8	SWC (18) 16:9;25:9;28:16;29:16; 39:1;57:8;93:8;94:22;95:2,9; 99:18,23;100:19;102:20; 112:12;185:11;192:11; 200:14
storage (55) 37:25;67:11;71:24;74:15, 16;75:3;78:3,5,11;80:12,13, 15,19;82:18,20;84:7;235:1,2, 8,19;237:10,13,16,20;238:1, 7,11,14;242:18;243:2,7,13; 245:10,20;253:10,13,16,17, 24,24;254:15,17,22;255:10, 12,22;258:16,19;259:11,17; 260:6,13,17,22;263:19	subdivision (1) 95:20	summer (3) 96:8;183:2;239:7	swear (2) 10:14;228:2
store (2) 234:6,20	subject (7) 23:15;67:23;68:1;138:6, 21;157:20;224:9	supplemental (28) 23:6,12,14;24:21;62:12; 63:9;154:14;156:7,14;180:8, 21;181:1,6,18,23;183:10; 184:8,9;185:3,11,20;186:1; 207:9,15,18;210:18;222:17; 224:6	switch (1) 121:25
stored (1) 235:25	submit (2) 14:1,5	supplied (1) 116:20	swoop (1) 236:25
story (1) 32:7	submits (1) 36:8	supplies (7) 97:15;100:15,17;222:14; 234:1;237:10;259:16	
straight (1) 143:14	submittal (1) 27:1	supply (56) 37:11,24;41:15,20;42:21; 43:24;44:3;46:3,9,13,21,24; 48:24;50:18,24;52:14,22,24; 53:4,15,16,17;59:1,2,2,3,6, 11,19;62:13;98:12,15,24; 100:20;101:13,15;102:19; 103:2;131:6;141:9,12; 171:20;178:5,10,17;180:21; 232:7;233:13,20;245:16; 247:9,10;259:7;260:1,2,12	
straightforward (1) 210:6	submittals (1) 25:13	supplying (2) 131:4;254:22	
streams (1) 261:22	submitted (11) 13:17;15:3;25:17;27:5; 29:15;61:25;95:2,13;120:25; 121:6;157:8	support (6) 12:9;106:4;175:1;181:10, 11;189:17	
	subsequent (1) 171:4	suppose (2) 223:6,6	
	subset (1) 154:5		
	substantial (1) 159:14		
	subtract (1) 208:6		
	subtracted (2) 44:11;183:16		
	success (1) 185:7		
	successive (1) 191:9		
	sudden (1) 264:24		
	suffice (1) 15:15		

<p>sworn (4) 10:18;122:5;150:3;228:10</p> <p>symbols (1) 166:1</p> <p>synthetic (1) 42:3</p> <p>system (30) 66:6;70:22;71:4;72:1,22; 99:7;105:17,22;126:1; 133:22;140:17,24;141:5,15; 162:23;164:24;183:13; 213:7,9;229:23;234:3;236:2; 237:13;238:2;241:4;253:10, 13,24;256:6;260:7</p> <p>systems (3) 222:8;247:11;261:20</p>	<p>191:22</p> <p>tan (1) 33:25</p> <p>tap (1) 221:3</p> <p>tapping (1) 220:25</p> <p>target (3) 67:21,24;186:22</p> <p>targets (5) 66:19;69:4;77:5;171:9,10</p> <p>task (2) 182:25;213:2</p> <p>tasked (2) 159:25;212:18</p> <p>tasks (1) 90:19</p> <p>taught (1) 105:22</p> <p>TDF (1) 245:25</p> <p>technical (83) 12:17;13:8,10,20,23,24; 14:2,3;17:12,19;20:6,8,24; 21:21;22:20,24;24:20;26:8, 23;28:5,9,21,22;29:4,6; 30:15;32:16;35:22;40:9; 45:8,25;46:5,20;47:17;48:2, 11,17;51:20;53:21;54:22; 60:9;63:18;78:23;92:4,7; 93:9;100:9;116:23;152:24; 154:6,10;156:23;157:19; 158:6;161:3,5,12,16,18,21, 25;173:19;174:5,6,15,18; 177:11;189:10,12;192:1,9, 17;193:3;198:1,4;204:4,6, 19;206:11;214:7;219:6; 223:12,15</p> <p>technically (19) 156:1,24;162:2;163:16; 165:14,15;167:8;168:12; 170:12;183:8,11;184:5; 185:24;186:3;187:20; 188:18;200:7;206:8;258:4</p> <p>Technology (2) 11:19,21</p> <p>tempered (1) 156:2</p> <p>temporal (1) 189:2</p> <p>temporary (1) 216:15</p> <p>tempting (1) 174:11</p> <p>ten (8) 11:25;12:4;65:20;90:7,8; 124:10;152:18;179:4</p> <p>tends (1) 203:3</p> <p>tens (1) 27:21</p> <p>tension (1) 168:10</p>	<p>tenure (1) 170:1</p> <p>term (3) 53:9;109:7;215:22</p> <p>terms (62) 21:3;27:22;32:18;35:14, 17;36:8;37:21,24;38:16; 39:22;40:13,16,19,20;41:17, 18,22;43:7;44:15;45:20; 52:6;54:1;57:9;58:11;59:10, 17;65:23;67:7;69:7;70:10; 72:20;73:19,21;74:10,12,15; 75:6;76:1;86:2;97:5;98:8; 100:7;101:5;103:15,19; 104:19;107:6;115:22;135:3, 8,17,18,24;141:16;142:20; 145:22;146:24;147:17; 174:19;203:6;220:24;233:20</p> <p>test (2) 79:22;81:1</p> <p>tested (4) 47:10;48:14,18;227:16</p> <p>testified (19) 10:19;24:19;42:9;62:11; 92:18;93:5;101:18;110:8; 122:6;134:15;150:4;178:14; 207:9;213:24;215:17;219:2; 225:9;228:11;233:11</p> <p>testify (5) 85:2,3;122:21;135:22; 136:1</p> <p>testifying (2) 101:12;110:2</p> <p>TESTIMONY (68) 7:4;9:14;12:10;14:15; 18:12;27:18;33:16;36:10; 49:15;50:10,23;55:25;64:24; 65:23;67:7;73:14;87:25; 88:6;90:5,12,16;92:3,6,22; 96:18;97:1;98:4,5,10;99:14, 20;100:22,25;101:16; 107:15,23;110:2;115:4,9; 119:6,25;120:18,20;132:18, 22;139:4;140:10;142:7,10; 160:21;161:11,14;179:23; 184:21;193:4;194:8;196:4; 197:1;198:16;200:25; 206:13;207:8,12;245:18; 249:9;251:8;258:18;261:8</p> <p>testing (1) 80:20</p> <p>Teton (27) 232:12,19;233:6;238:19, 21,25;239:3,6,9,12,13,17,20, 22,24;240:4,7,11,16,20; 241:3,5,12,22;242:3,8;256:5</p> <p>Teton-Sugar (1) 240:12</p> <p>TFC (1) 42:16</p> <p>TFCC (2) 55:6;64:20</p> <p>Thanks (3)</p>	<p>9:24;227:17;240:5</p> <p>theme (1) 203:1</p> <p>themes (1) 202:22</p> <p>therefore (2) 155:23;251:20</p> <p>thinking (2) 148:7;163:15</p> <p>Third (8) 39:13;40:25;155:25; 191:15,16,23;255:4,5</p> <p>Thompson (23) 7:7;211:3,6,7;212:16,17; 218:7,9;222:13;224:15; 226:20;227:5;243:23;244:2, 3;246:5,8;249:12,24;251:9, 11;252:12;261:6</p> <p>thorough (1) 48:12</p> <p>thoroughly (1) 184:14</p> <p>though (4) 55:6;168:24;187:4;206:1</p> <p>thought (14) 74:7,9,21,22;120:17; 128:9;130:20;140:12,14; 141:11;153:17;175:22; 260:16;265:5</p> <p>thoughtful (2) 170:15,16</p> <p>thousands (1) 27:22</p> <p>three (13) 33:18;37:10;48:15;60:23; 79:8;153:14;156:11;181:25; 183:20;199:20;205:22; 241:10;262:22</p> <p>three- (1) 241:11</p> <p>three-year (1) 133:25</p> <p>threshold (4) 203:24;204:1,10;219:5</p> <p>thresholds (1) 173:24</p> <p>throughout (7) 15:2;65:25;101:22; 107:13;180:12;251:12; 256:18</p> <p>thumb (1) 205:13</p> <p>thumbnail (1) 182:1</p> <p>time' (2) 162:24;164:25</p> <p>time-constrained (1) 166:14</p> <p>times (6) 47:11;134:9;144:23; 179:4;181:13;203:11</p> <p>timing (9) 76:4,16;102:21,22,23,24;</p>
T			
<p>Table (53) 16:9;17:8,17;18:5,9;20:1, 3,7,16;21:1;28:16;29:2,10; 30:25;31:1;45:4,6,13;46:17, 18,22;47:12;48:4,5,6,15; 54:5,5;55:10,12,18,20;57:15; 58:18,18;84:18;85:1;88:1,2; 93:7;114:7;119:1;132:1; 138:24,25;143:3;145:14,14; 148:17,24;250:15;251:11; 252:22</p> <p>tables (2) 246:23,24</p> <p>tabulates (1) 86:11</p> <p>tabulating (1) 59:8</p> <p>tail-out (1) 261:20</p> <p>tailwater (1) 261:25</p> <p>talk (21) 36:24;42:25;69:12;106:3; 142:19;154:12,15;156:11,13, 15;158:23;162:5;176:10; 180:8;186:12,14;199:10; 248:19,21;256:8;262:15</p> <p>talked (16) 49:17;128:6;133:17; 170:17;176:16;182:14; 189:10,15;194:24;199:11; 203:9;217:8;219:19;222:18; 225:8;244:7</p> <p>talking (23) 22:18;32:8;43:4;54:10; 68:24;76:3;86:14;87:1; 136:7,9;172:8,10;177:19; 179:8;202:23;221:14; 249:25;254:25;255:15,22; 256:4,16;263:18</p> <p>talks (4) 49:20;71:19;156:12; 208:14</p> <p>tall (1)</p>			

165:10;188:24;192:12 tiny (1) 151:9 title (3) 152:10,11;153:25 titled (1) 24:10 TJ (3) 237:6,7;258:15 TJ's (1) 111:2 today (19) 9:11;11:4;14:11,15;65:24; 67:8;85:4;91:3;93:5;122:16, 21;207:8;211:9;220:16; 222:20;231:13;235:14,18; 249:3 together (5) 15:21;55:14;139:22; 143:4;174:23 told (3) 131:6,16;137:17 tolerance (2) 173:20;175:6 tomorrow (2) 9:14;264:16 Tony (29) 228:3,19,21;231:12,20; 236:18,22;237:5;240:5; 242:10,21;244:3;245:24; 246:9;248:16,18;249:1,12, 24;250:24;251:3,11;252:3; 253:6;257:13;258:9;261:5; 263:4;264:12 T-o-n-y (1) 228:21 took (4) 28:10;56:4;99:1;210:9 tool (29) 67:2;77:3;102:14;167:13, 19;168:19;169:3,4,18,18,19, 21;174:12,13;179:20;191:2, 4;214:10,13,16,20,25; 215:15;220:22,23,24,25; 221:10;224:19 toolbox (1) 169:20 tools (5) 156:25;174:10;188:14,15, 15 top (7) 41:18;43:16;59:11; 103:23;104:3;202:16;231:9 topic (3) 25:8;238:16,17 topics (1) 157:25 topography (1) 195:15 total (13) 37:23;39:1,3;40:1,11; 43:21;44:18;45:21;46:25; 61:15;165:4;251:12,20	totally (1) 140:17 touch (1) 221:2 touched (6) 61:9;83:2;175:2,11; 177:16;185:9 Towards (7) 164:13;239:6;255:11; 259:11,14,17;260:22 track (2) 229:22;237:14 tracking (1) 175:7 tract (4) 194:25;195:12,17;209:6 trained (1) 182:22 transactions (1) 237:20 transfer (5) 12:10;191:4;214:10,20; 215:8 transient (56) 43:3,8,9;56:2;85:17;86:25; 91:11,13,25;115:1,5,12,16; 116:13;128:1,4;130:4;139:5; 143:14;148:6,17;154:8,16; 158:1,4;160:6,10,15;161:6, 13,21,25;162:2;165:24; 166:4,7,9,12,22,25;167:7,12, 14,24,25;168:3,7,9,13; 196:20;206:11;216:18; 224:22;225:14;226:12; 227:10 transit (1) 223:3 transition (2) 198:23;222:15 transitioned (1) 151:24 transmissivity (15) 67:11;71:24;72:21,23; 74:13;82:18;103:25;104:9, 19,20,21,24;105:2,12,15 transparency (1) 159:14 Travis (2) 211:7;244:3 treated (1) 118:13 tremendous (1) 221:8 tribes (1) 256:2 tributaries (10) 229:19;239:11,14,17,21; 240:2,22;241:16,21;242:7 tributary (17) 66:15;67:13;77:22;78:1; 80:10;83:17;165:5;232:9; 233:2;239:23;240:18,20; 241:4,8,13,14,19	tried (3) 56:5;80:8;158:5 trigger (1) 221:11 touched (6) 109:4,7,8,14;110:3,9,20 trimester (1) 192:12 trouble (1) 243:3 true (11) 96:17;102:10;108:6; 114:20;163:22;196:10; 219:11;224:25;245:21; 248:24;256:18 truth (4) 10:19;122:6;150:3;228:10 try (9) 15:13;48:8;79:19;123:7; 136:14;153:18;168:1; 181:10;264:24 trying (19) 47:5;66:17,24;67:22; 70:19;77:15;78:7;79:3;80:2; 96:15;97:11;114:19;115:10; 153:19;156:25;167:15; 175:8;187:5;249:20 TSCHOHL (2) 195:23;264:17 Tuesday (1) 160:20 turn (15) 16:7;17:6;22:4;77:6;93:7; 103:20;129:12;153:13; 162:17;165:17;180:13; 188:4;189:25;192:5;217:23 turned (1) 73:13 turning (4) 96:18;169:23;193:17; 241:14 turnout (1) 223:7 TWG (4) 16:10;17:9;28:17,18 twice (1) 170:1 Twin (38) 19:22;20:14;27:19;30:16, 18;31:5;42:14,16;46:9;49:4; 50:25;54:19;56:19;58:4,7, 14;59:12;60:14;94:4,23; 95:10;112:15;114:9;132:21, 23;174:1;197:5;209:23; 210:14,19;223:7;235:6,15, 18;236:3;260:12,13;261:24 two (35) 17:21;26:16;71:24;79:8; 85:23;86:22;111:1;112:8; 120:5;141:20;155:19;156:6, 15,17;160:24;161:17; 169:24;171:4;175:12;187:4; 190:21;191:9;192:13;	193:24;205:19;217:7,9; 219:20;224:17,19;226:6; 228:25;235:9,10;259:13 twofold (1) 163:13 two-thirds (1) 64:4 type (13) 12:6;27:8;68:7,9;74:19; 86:2;87:3;129:25;130:1; 162:4;173:5;221:13;256:22 types (3) 125:10;173:23;226:6 typical (4) 43:18;173:24;174:17; 254:2 typically (5) 66:21;125:17;239:6,15; 256:25 typo (4) 58:21;120:1,11,23 typos (1) 157:14
U			
			ultimately (10) 33:21;39:23;62:23,25; 75:4;79:7,9;80:25;81:8,17 unable (6) 22:10;179:5;184:25; 200:16;205:6,7 uncertainties (1) 76:22 uncertainty (34) 67:16,19,20;68:2,4,8,10; 71:19,20;72:6;76:20;83:24; 84:1,4,22,23;103:4,6,8,11; 107:22,25;108:9,10,11,13, 25;109:1,5;117:15,19; 158:10;200:18,18 unclear (2) 115:2;139:4 under (44) 16:14;22:18;23:13;34:25; 43:7,9;56:2;65:12,13;69:12; 75:25;76:13;80:20;87:2; 92:15;96:21;119:20;120:12, 12,14;127:8;130:3;131:3,7, 20;132:1;143:17,23;145:2,4, 18;151:21;179:23;185:12; 190:10;198:23;213:22; 238:3,7,21;245:6;255:6,8; 256:25 underflow (5) 67:13;77:23;78:1;80:10; 83:17 underlying (2) 183:18;208:14 undermines (1) 198:5 underreported (1) 183:23

<p>understood (4) 87:25;88:6,25;140:16</p> <p>unheard (2) 213:15,17</p> <p>unique (1) 43:17</p> <p>United (2) 230:7,8</p> <p>units (1) 105:1</p> <p>University (5) 34:25;151:3,19;228:25; 229:2</p> <p>unknown (1) 94:20</p> <p>unless (4) 111:3,23;113:18;172:8</p> <p>unlikely (2) 51:10;236:4</p> <p>unnecessary (3) 37:7,8;57:10</p> <p>unreasonable (5) 248:8;250:5,21;251:15; 252:7</p> <p>unregulated (2) 230:9,18</p> <p>unrelated (1) 212:3</p> <p>unstructured (1) 106:24</p> <p>unusually (1) 234:11</p> <p>up (52) 23:4;25:4;27:21;31:22; 34:25;35:3,18;37:2;43:16; 47:3;53:3;65:8;67:5;76:24; 77:4;81:14;83:23;85:19; 86:13;89:11;105:6;106:12; 109:22;111:10;121:2;123:7; 126:1;133:22,23,25;138:6, 24,25;141:5,19;142:2,3; 144:23;149:17;159:13; 198:22;200:3,24;201:3; 231:24;234:17;237:9;239:9; 249:19,22;257:25;262:13</p> <p>update (6) 34:14;39:14,16;40:4; 55:16;223:22</p> <p>updated (6) 18:22;25:14;29:25;32:4; 94:25;120:25</p> <p>updating (4) 36:1;58:4,8;114:16</p> <p>upon (10) 96:5;105:8;110:4;113:7; 170:19;174:8;176:2;213:19; 214:13;258:16</p> <p>Upper (12) 144:20;229:22;232:3; 237:12,20;238:2;239:5,10, 20;240:7,9;242:3</p> <p>upriver (1) 217:15</p>	<p>upstream (7) 230:15,19,22;234:5,7,16; 241:18</p> <p>up-to-date (2) 36:6,15</p> <p>use (111) 23:6,12,14;24:21;27:8; 29:13;31:20,23;33:11,11,19; 35:4,5;36:18,19;39:6;52:23; 53:16,16,18;59:6,7;66:15; 74:7;78:19;79:4,14;88:13; 90:18,22;91:22;92:1,94:8, 20,22;96:1,2,3,13;101:14; 103:1;108:17;113:19;115:3, 16,18;118:4;124:25;126:11; 130:10;154:10,16,17;156:1, 2,14;158:7;163:8,21;168:2,4, 13;170:11;171:18;172:15; 174:12;177:23;178:2,16,17; 179:7;180:9;181:14,18,23; 183:10,12;184:2;185:4,17; 188:13;192:11;196:15; 197:24;200:8;207:10,15; 208:23;209:7,11,19,24; 210:14,15;211:20;215:4,8, 25;216:3,10,18;220:23; 221:20;222:1,18,20;225:11; 244:10,23;260:14;263:9</p> <p>used (94) 17:24;18:15,19,20;19:3,7, 7,11,20;20:11,19,20,25;30:7, 11;31:5,12,19,24;32:1,3; 33:9;34:3;35:8;36:2,6,13; 37:3,16;38:23;39:17;42:5; 46:23;48:16;52:4;55:23,24; 58:8;63:21;65:7;67:1;91:10; 96:13;98:7;109:7,11;110:20; 112:22,24;113:1;117:15,17, 19,23,25;131:3;163:18,19; 166:10,12,15,16,21,25; 167:1,19;168:7,7,22,25; 170:13;173:9;177:7;179:20; 187:16,18,22;188:17; 192:17;198:24;199:12,18; 200:12;211:22;216:6,14; 220:20;224:16;225:15; 227:10;239:9;253:10;259:7; 264:7</p> <p>useful (8) 158:22;169:22;172:22,24; 173:25;174:3;219:3,6</p> <p>user (3) 40:19;178:13;263:14</p> <p>users (13) 37:6;87:16;110:13; 124:24;133:16;141:9;147:1; 174:23;178:14;203:19; 222:7,14;256:1</p> <p>uses (8) 23:4;106:2;124:21;167:6; 168:11;170:4;187:11;226:6</p> <p>USG (1) 106:23</p>	<p>USGS (1) 230:19</p> <p>using (56) 18:11;27:6,14;28:8;29:21, 22;31:22;35:1;36:4,14; 38:23;40:7;50:16;55:15,17, 22;56:8;58:1,1,2,11,14; 60:22;61:16;65:5;68:16; 73:15;75:19,21;78:19;79:19, 22,23;81:22;82:8,13;86:24; 88:3,7,14,20;91:10;109:1; 113:3,14;118:3;159:10; 160:1;169:13,25;173:14; 214:10,19;221:20;224:19; 259:25</p> <p>usually (4) 241:1,18;244:14,22</p> <p>Utah (1) 229:2</p> <p>utilize (1) 94:20</p> <p>utilizing (2) 96:20;196:10</p> <hr/> <p style="text-align: center;">V</p> <hr/> <p>valid (1) 182:21</p> <p>Valley (10) 86:6;102:2,5,7;123:13,13; 151:13;240:9,15;241:22</p> <p>valuation (1) 177:20</p> <p>value (18) 49:5,7;80:13,13,15;82:21, 22;83:3,5;84:7;107:6; 113:13;176:14,19;201:11; 213:11;219:3;220:12</p> <p>values (25) 39:6,7;67:13;72:24;74:17; 78:5;83:13;102:13;104:20; 165:3;173:2,4;201:6;213:18; 217:8,14,14;218:11,16; 219:12;234:14;248:8; 250:19;251:15;252:7</p> <p>variabilities (1) 49:9</p> <p>variability (7) 171:14,17;173:7,11,18; 177:3;220:2</p> <p>variable (1) 86:1</p> <p>variables (2) 48:24;52:17</p> <p>variations (1) 194:12</p> <p>varied (1) 219:20</p> <p>varies (2) 115:22;247:8</p> <p>variety (1) 96:1</p> <p>various (18)</p>	<p>12:12;13:16;28:12;29:2; 33:4;53:11;56:2,66:13; 93:11,12;164:7;170:8,8; 211:23;219:12;229:14; 232:3;247:2</p> <p>vary (2) 96:4;252:5</p> <p>verification (4) 79:20,21;81:16;199:3</p> <p>verified (3) 94:16;95:2;117:25</p> <p>verify (4) 34:11;79:19;95:12;195:5</p> <p>version (29) 20:5;66:11;72:10,23;73:5, 9,18;74:21;75:14,19,22,25; 76:17,25;80:17;81:5,8,13; 84:12;90:23;91:11,13,20; 92:1;106:22;111:2;170:22; 215:14;216:14</p> <p>versions (8) 72:13;160:16;190:22; 213:25;219:20,20;224:17,19</p> <p>versus (5) 41:23;57:3;83:11;102:23; 115:1</p> <p>vertical (5) 66:4;70:8,12,22;105:23</p> <p>vertically (1) 71:8</p> <p>vicinity (3) 71:5;86:15;104:23</p> <p>view (3) 191:11;210:2;231:22</p> <p>viewpoint (1) 191:11</p> <p>views (1) 170:11</p> <p>visual (2) 157:11;240:24</p> <p>volume (11) 31:23;77:11;85:21;91:24; 126:8,11;213:6;214:24; 244:11;247:18;250:12</p> <p>volumes (5) 23:4;99:7;251:12,16;252:4</p> <p>voluntary (1) 238:8</p> <p>vote (1) 81:7</p> <hr/> <p style="text-align: center;">W</p> <hr/> <p>wades (1) 160:12</p> <p>Wait (4) 190:17;222:11;242:19,20</p> <p>wants (2) 203:20;257:22</p> <p>Warner (1) 175:25</p> <p>warranted (1) 103:13</p>
--	--	--	--

<p>water (324) 12:8,10,13,16;20:18; 25:14,16;27:15,22,23,25; 29:15;36:7;37:2,6,11,21,23; 39:3,11;40:1,11,19,41:6; 43:22,24;44:2,2,6,10;45:21; 46:14;49:19;51:25;52:25; 53:2,12,12,24;55:7;59:10; 61:12,15;62:1,22;63:2,6; 66:5,21;67:12;68:2,8,16; 71:7,25;72:22;73:20;74:4; 75:6;76:10,19;77:4;78:8,9, 11;79:15;83:2,4,24;84:3,4; 88:24;91:16,24;92:7;95:13; 98:9,11,15,24;99:3;100:20; 101:9,25;103:2,8;107:25; 108:16;109:2,17;110:12,13, 16;112:22;113:4,5,7,25; 114:17,22;115:6,11;122:22; 123:14;124:24,25;125:1,16, 23;126:2,11;127:2,4,5,8,8, 15,16;130:2;131:4,5,7,11,21; 132:25;133:11;135:2,7,18; 139:7;140:22;141:4,9,9,12; 143:21;146:19;147:2,19,24; 150:2,14;151:5,7,12,16,19, 21,25;152:1,9,18,20;153:5; 154:13,14;155:3;159:3,6; 169:14;170:14;171:20,20; 172:2;174:21;175:20,25; 177:24;178:4,6,9;179:10; 180:8;181:9,10;182:5,13; 183:12,15;186:1;189:6,21; 191:24;195:9;197:15; 200:19;201:15,22;203:18; 208:21,25;209:5,11,13,24; 210:14;211:1,19,20;213:4, 11;214:3,24;221:14,16,17, 18,20;222:3,7,8,14,14; 223:16,17;226:16;227:20; 229:6,11,12,15,17,22;230:2, 3,14,23;231:3,11,14;232:7,7, 18;233:13,20,24,25;234:2,6, 20,20;235:3;236:1,12,20; 237:10,11,13,15,16,20,23; 238:1,10,11,14,20,22; 239:11,15,16,23;240:1,3,14, 19;241:2,8,11,15,17,20,30; 242:6;243:13,21;245:9,15, 16;246:16,17,25;247:9,9,19; 248:25;251:12;253:9,14,16, 17,17;254:1,14,16;255:1,3,4, 5,9,18;256:1,6,9,20;258:25; 259:20;260:5,6,8,9,11;261:7, 10,13,21;263:7,9,13,14,14, 18,22,23</p> <p>watermaster (11) 229:5,8;230:1;233:19; 237:12;238:22;240:25; 246:3,16;248:7;260:4</p> <p>watermasters (2) 252:23,24</p> <p>watershed (2)</p>	<p>229:3;233:17</p> <p>watersheds (1) 234:1</p> <p>way (33) 10:13;42:25;46:12;53:13; 62:21;64:4;67:2;69:9;82:10; 84:1;108:22;115:6,17;131:3; 147:18;156:18;168:6; 174:12;177:11;182:20; 184:24;185:19;187:16,21; 198:7;201:13;203:22;206:2, 2;219:25;242:11;254:19; 258:20</p> <p>ways (6) 46:11;79:24;119:2; 163:21;169:24;183:4</p> <p>wear (1) 176:22</p> <p>weather (1) 35:2</p> <p>website (2) 155:5;231:3</p> <p>week (1) 244:14</p> <p>Weekly (1) 223:10</p> <p>weeks (1) 236:6</p> <p>weigh (1) 231:8</p> <p>weighed (1) 220:24</p> <p>weight (1) 231:10</p> <p>welcome (1) 87:20</p> <p>well-justified (1) 79:6</p> <p>wells (7) 48:18;51:19,20;73:20; 151:12;224:25;225:1</p> <p>weren't (4) 99:2;129:9;179:22;242:14</p> <p>west (1) 151:13</p> <p>wet (1) 131:4</p> <p>whatever's (1) 93:22</p> <p>what's (20) 18:10;28:24;45:22;65:13, 24;70:5;93:25;94:18;109:7; 122:24;152:10,23;163:11; 168:18;174:24;185:10; 186:25;187:5;245:25;254:2</p> <p>wheeled (1) 61:12</p> <p>whenever (2) 56:12;84:11</p> <p>whereby (1) 126:1</p> <p>wherever (1) 78:10</p>	<p>white (2) 129:13;170:7</p> <p>whole (8) 107:2;160:24;172:10,11; 186:5;239:4;240:9,16</p> <p>Who's (1) 152:6</p> <p>wide (2) 50:20;103:16</p> <p>widespread (1) 74:12</p> <p>Willow (5) 232:14,22;233:7,13; 234:13</p> <p>W-I-M-S (1) 183:12</p> <p>window (1) 191:11</p> <p>windshield (1) 195:5</p> <p>winter (3) 144:17,20;254:3</p> <p>wish (6) 155:19;207:2;217:21; 219:17;238:17;264:23</p> <p>withdraw (1) 256:14</p> <p>withdrawal (1) 146:4</p> <p>withdrawals (1) 159:6</p> <p>within (27) 27:17;36:20;37:12;70:4; 85:19,22;95:16;126:12; 130:14;144:1;157:24;168:2; 170:1;171:22;175:5;180:2; 183:14;185:11,16;209:13, 23;210:19;217:14;218:16; 229:13;230:2;250:2</p> <p>without (7) 32:22;37:6;53:3;87:6; 194:19;195:12;218:23</p> <p>witness (46) 9:17,25;10:11;12:9;23:21; 26:6;33:8,11;78:18;98:19; 110:7;111:24;116:11;121:9, 10,18,24;122:10;134:23; 135:5,9,12,15,20,22,23; 146:15;152:14;153:19; 162:13,15;185:13,15; 190:21;224:14;236:23; 243:3,9,12;248:10,13,18; 249:1;257:13,15,20</p> <p>witnesses (4) 149:14;160:22;194:6; 202:23</p> <p>WMIS (3) 183:14,19;224:11</p> <p>W-M-I-S (1) 224:14</p> <p>wonder (2) 111:8;221:11</p> <p>Wonderful (1)</p>	<p>14:10</p> <p>wondering (1) 265:10</p> <p>WOOD (10) 9:18;16:16,19;24:7,12,14, 17;162:9,11,14</p> <p>word (8) 33:6,9;168:22,24;214:19; 216:1,3;262:7</p> <p>work (47) 12:6,25;14:24;15:24;22:7; 24:25;25:6;35:23;92:5;93:1, 9;105:15;121:4;127:10; 151:4,11,18,21,25;152:1,1; 157:16;158:8,9,11,25;169:4; 170:18;174:15,18;175:9; 177:11;189:11,12;190:8; 192:1,17;193:3,8;197:15; 198:10;204:9,19;211:13; 220:16;221:10;264:17</p> <p>workaround (1) 16:1</p> <p>worked (11) 12:20;32:19;90:14; 151:15;155:3;159:1;194:23; 199:3;212:13,21;214:3</p> <p>working (56) 12:3,4,17;13:20,23,24; 14:2,3;16:3;17:13,19;20:6,8, 24;21:21;22:20,25;24:20; 26:8,23;28:5,9,21,22;29:4,7; 32:16;34:24;35:23;40:9; 45:9,25;46:5,20;47:17;48:2, 11,17;51:20;53:21;54:22; 60:9;63:18;65:20;78:8,23; 81:12;90:5,14;92:8;100:10; 152:24;211:15;212:2,4; 223:16</p> <p>works (5) 67:3;114:23;239:2; 243:14;257:16</p> <p>worry (1) 169:5</p> <p>worst (4) 217:18,20;218:25;219:1</p> <p>wrapped (1) 200:24</p> <p>wrench (3) 169:21;221:1,3</p> <p>wrestling (1) 182:11</p> <p>writing (3) 159:16;265:7,10</p> <p>written (2) 14:12;132:22</p> <p>wrong (4) 69:5;84:15;175:20;177:6</p> <p>wrote (1) 98:7</p> <hr/> <p style="text-align: center;">Y</p> <hr/> <p>yea (1)</p>
--	---	---	---

<p>142:18 year (160) 23:4;25:2;30:11;31:20; 32:4,10;34:13,14,16;36:11, 24;37:16;38:19,22;39:2,8,14, 17,18,19,20,21,23,24,25; 40:4,6,10,16;41:1,9,12,13, 22;42:3,12,15,19,21;43:19, 25;44:1,11,13,14,16,21,24; 45:15,17;47:23;49:13,19; 51:8,8;53:15,23;54:8,8; 55:16,16,17,19,20,23;56:10, 23;57:7,8,22;58:25;59:1,18, 22,25;61:2,16;62:7,7,8,25; 86:24;88:3,8,18,20;91:21; 94:14;95:23;96:19,20,21; 97:2,6,10,19,19;98:3,5,13, 15;99:3,17;100:20;101:1,4; 115:7,11,15,20;116:4; 125:19;127:11,23;128:14, 19;129:10;131:12,14; 133:24,24;136:10;138:12; 139:13,20;140:13;141:12; 145:6,10,12;146:22;163:8, 10,10;164:1,2;168:16;187:8; 191:15,16;199:20;201:23; 204:11;233:20;234:10; 237:21,21;244:9,12;247:5,7; 248:2,6;251:19,24;259:12, 24;261:11,13;264:9 years (72) 11:24,25;12:4;32:2,3;34:8; 35:6;37:1,18;40:23;45:7; 47:24;55:6;56:16,16,24; 57:1,1,3;60:12,17,19,23,25; 61:5,14;65:20;84:13;88:9, 15;89:1,2;90:7,8;94:7,17; 96:22,23;98:6;124:10; 128:23;132:13,15;141:17,18, 19,20,25;142:5;143:1,2; 144:25;147:11;182:11; 183:20;204:16;206:15; 214:18;221:15;228:25; 229:2,8,9;230:13;235:24; 239:9;240:25;247:22; 248:11;251:25;256:11;259:6 yellow (2) 75:12,18 yep (1) 32:2 yesterday (2) 111:2;132:18</p>	<p>130:17 0.1 (1) 171:15 0079 (1) 218:22 04 (1) 53:18 05 (1) 82:22 05S31E27ABA1 (1) 51:14 06 (5) 39:10,24;40:25;45:16; 53:18 08 (3) 39:10,24;41:1 08-12 (2) 41:3,4</p> <p style="text-align: center;">1</p> <p>1 (28) 40:15;131:10;151:21; 171:17;178:3,17;179:6; 213:12;221:21;229:6,11,12, 17,22;230:2,3,23;231:3; 233:25;237:12;238:22; 246:16;247:20;251:13; 252:5;261:7;263:14,23 1,000 (5) 163:6,7;164:1;165:8,9 1.1 (1) 159:11 1:00 (1) 111:14 10 (13) 28:16;49:12;60:10;93:6; 120:22;141:19,22;180:13, 16;204:16;213:16,22;252:5 10,000 (2) 27:21;61:21 100 (8) 39:10;40:24;41:10;42:6; 178:12;256:16;263:24;264:4 100,000 (2) 59:21;133:2 100.00001 (1) 203:12 101 (6) 40:1,24;41:1,6,10;45:20 102,000 (1) 125:8 103 (4) 14:14;21:10;23:24,25 104 (3) 40:11,15;41:7 106 (1) 42:15 1092 (1) 122:19 11 (2) 30:13;165:17 11,500 (1)</p>	<p>54:12 110,000 (1) 54:18 12 (7) 32:12;39:24;41:1;141:19; 142:2;164:15,15 120 (1) 233:6 120,000 (1) 40:18 124 (1) 233:5 125 (5) 217:24;218:2,6,7,13 13 (2) 35:10,20 13,324 (1) 235:16 15 (7) 64:7;115:20;116:3,4; 141:23;196:20;225:17 15,000 (5) 30:17;31:4;64:21,24,25 150 (1) 144:23 15-minute (1) 193:24 16 (4) 56:16;57:1,3;218:19 16th (3) 21:15;26:14;45:24 17 (2) 38:18;229:9 178 (1) 233:7 18 (1) 42:10 180- (1) 133:1 186 (1) 233:7 1884 (1) 239:8 1885 (1) 239:7 19 (2) 30:17;45:4 190 (1) 218:2 1900 (2) 56:13,17 194,732 (2) 30:18;64:22 195,000 (1) 133:1 1953 (4) 128:16;130:15,25;226:18 1961 (2) 43:11;75:17 1983 (1) 229:3 1986 (2) 34:8;35:6</p>	<p>1990 (1) 230:5 1993 (1) 144:3 1996 (2) 34:8;35:6 1999 (3) 205:22,25;215:13 1st (4) 234:15;244:15,18,23</p> <hr/> <p style="text-align: center;">2</p> <hr/> <p>2 (7) 23:13;112:8;126:5; 178:15;194:17;195:17; 221:20 2,000 (4) 164:1,2,6,7 2.1 (6) 18:5;72:24;84:9,10;108:3, 20 2.2 (9) 72:15;84:10;107:18;108:3, 20;125:19;126:4,6;220:6 2.2.2 (1) 119:21 2.4 (1) 126:5 20 (4) 43:15;76:1;143:2;204:16 200,000 (1) 125:7 2000 (13) 18:2;19:2,4,8;20:13;34:9; 37:18;38:24;39:2,15;40:5; 55:15;57:19 2000s (1) 222:21 2000-to-2021 (1) 45:10 2001 (1) 151:20 2004 (1) 237:23 2005 (3) 123:3;205:25;230:5 2005-2007 (2) 18:11;19:14 2006 (11) 32:14;34:7;35:6;39:1,6; 160:13;163:15,20;165:22; 206:1;230:4 2008 (8) 30:21;32:9;34:3,12;38:24; 39:3,6;69:18 2010 (6) 11:24;18:25;19:10;151:20, 24;198:22 2011 (10) 29:21;30:21;93:17;94:5, 11;95:3;246:9,15;261:6,10 2012 (5)</p>
---	---	--	---

12:3,20,21;39:19;90:13 2013 (12) 12:3,21;18:6;19:6,20; 94:12,19,21;95:1,8;117:22; 206:3 2014 (8) 18:2,21;19:4,8;20:6,13; 39:16;47:21 2015 (41) 11:23;13:24;14:2,13; 16:10;17:9,11,23;18:18; 20:23;21:15,21;22:22;23:22; 24:20;25:20;26:7,14;28:9, 22;30:10;32:17;46:4,20; 47:14;48:11;50:19;52:20; 63:11,18;92:4;93:2;134:8, 10;135:3,8;136:11;141:25; 145:18;146:18;147:14 2017 (9) 29:25;30:22;32:10;34:13; 93:17;94:5,5,11;210:4 2018 (29) 40:7,10;42:15;43:18,23; 44:7,11,12;45:9,16;53:23; 55:17,22;56:8;57:7;59:2,4; 61:2,10,13,18;62:3;88:3,7, 20;96:20;98:4,12;99:3;101:5 2019 (1) 230:4 202 (1) 148:4 202,000 (2) 125:7;148:2 2020 (7) 40:7;45:9;73:4,6;76:24; 79:17;211:13 2021 (8) 30:5,22;34:16;40:6;58:10, 12;93:18;206:14 2022 (24) 13:21,23;14:2,16;18:23; 20:9,9;28:5,17,18;29:4,6; 40:9;47:17;48:2;52:20; 55:15;57:19;58:11;63:12; 93:9;100:10;152:23;211:16 2023 (7) 45:24;136:10;138:1; 154:20;203:24;211:17; 231:19 205 (2) 148:4,12 205,000 (2) 148:3,15 20-year (1) 88:16 21 (3) 188:8;192:23;218:21 2-1 (4) 16:9;17:8;21:1;32:12 2-10 (1) 58:18 216 (1) 233:8	217,151 (1) 130:10 21st (1) 127:22 22 (2) 46:17;48:4 2-2 (2) 20:1;35:10 228 (1) 7:5 23 (3) 56:16;119:20;180:16 2-3 (5) 28:16;31:1;38:7;93:7; 119:1 237 (1) 7:6 24 (1) 132:24 2-4 (2) 45:4,6 240 (3) 148:7,12,19 240,000 (4) 147:2,9,25;148:2 240,000-acre-foot (1) 145:23 244 (1) 7:7 25 (3) 54:6;142:4;189:25 2-5 (2) 46:17;47:12 25,000 (1) 54:20 250,000 (1) 235:12 2500 (1) 122:19 253 (1) 7:8 258 (1) 7:9 26 (1) 55:11 2-6 (1) 48:4 261 (1) 7:10 263 (1) 7:11 27 (2) 57:15;114:8 2-7 (3) 38:8;54:5,5 28 (2) 190:6;192:5 2-8 (2) 55:10;88:2 28th (1) 231:18 29 (3) 157:10,11;193:17	2-9 (1) 57:15 2-acre (1) 195:12 3 3 (4) 71:15;141:24;178:16,23 3,262 (1) 143:12 3.3 (1) 191:1 3.4 (1) 191:4 3.4.2 (1) 69:12 3.4.3 (2) 71:15;104:5 3.4.4 (1) 84:17 3.8 (1) 80:23 3:30 (1) 193:25 30 (10) 47:1,10;65:3;111:2; 155:17;162:17,19;209:5,7,19 300 (4) 154:19;162:9,10;182:21 300- (1) 86:15 300,000 (3) 83:18;88:16,19 30th (3) 128:16;130:15;226:18 3-1 (4) 70:15,20;84:18;129:18 3-10 (1) 120:22 32 (1) 68:19 3-2 (1) 70:15 32,000 (1) 40:18 33 (2) 70:15;104:10 3-3 (2) 72:16;104:11 34 (3) 71:15;103:20,23 3-4 (1) 75:2 35 (1) 188:4 3-5 (1) 75:9 36 (2) 72:17;188:4 3-6 (1) 76:7 366 (6)	227:24;231:15;236:9,12, 15,16 37 (1) 75:2 3-7 (2) 77:7,9 38 (2) 75:8;195:20 3-8 (1) 82:15 387 (1) 114:8 39 (1) 76:19 3-9 (1) 82:25 3rd (1) 233:4 4 4 (3) 23:13;24:11;57:1 4,000 (1) 62:2 4,000-foot (1) 54:10 40 (3) 77:8;209:8,20 400,000 (1) 86:15 40-acre (3) 195:12,17;209:6 40-acre-tract (1) 194:15 41 (1) 80:23 42 (9) 171:13,14;173:11,11,17, 18;177:3,9;218:21 44,715 (1) 19:19 5 5 (10) 27:14,17,20;173:25;178:9, 11;194:16;213:7;219:2,21 5,000 (9) 61:20,23;209:14;255:7; 259:9;260:1,2;263:7,17 5.1 (3) 143:16,18,20 5.8 (1) 178:8 5:21 (1) 265:15 50 (2) 21:12;59:20 50,000 (2) 59:14,20 500 (9) 153:13;164:11,15;190:1,2;
---	--	--	--

<p>206:17,19,21,22 500,000 (1) 43:12 511 (1) 157:13 512 (2) 217:23;218:1 515 (2) 182:7,18 55 (1) 22:4 56 (4) 23:11;24:4,5,22 57 (1) 191:21</p>	<p>129:13,17;145:14;148:23; 149:6,7 83 (2) 162:20;163:12 83335 (1) 122:20 837 (14) 14:7;16:13,17,19;17:7; 24:4,6;26:4;28:15;87:8,12, 13;129:19;148:24 85,000 (1) 54:20 88,000 (1) 131:1 8th (1) 9:4</p>		
6	9		
<p>6 (2) 178:23;179:4 60 (6) 88:13;89:2;179:7;181:13; 185:16;197:23 60,000 (4) 42:17;43:1,10;59:18 600,000 (1) 83:21 61 (1) 218:20 65 (1) 132:24 65,000 (1) 54:17 66 (3) 25:19;26:4;89:1 68 (1) 26:16</p>	<p>9 (4) 20:2;116:3;196:20;225:17 9,000 (2) 62:4,5 9:00 (3) 9:3;264:15;265:12 900 (1) 57:4 90s (2) 56:22;106:9 916 (1) 14:17 93,000 (1) 54:13 940,000 (1) 57:4 941,000 (1) 56:14 97 (2) 39:2;87:1 97,000 (1) 56:11</p>		
7			
<p>7 (2) 213:14;231:17 7.3 (1) 80:4 70 (1) 87:1 75 (1) 191:20 75,200 (1) 235:16</p>			
8			
<p>8 (7) 17:7;246:6,7;252:13,15, 17,18 8,000 (1) 209:13 80s (1) 142:3 826 (1) 88:1 829 (6)</p>			

BEFORE THE DEPARTMENT OF WATER RESOURCES
OF THE STATE OF IDAHO

IN THE MATTER OF DISTRIBUTION OF) DOCKET NO.
WATER TO VARIOUS WATER RIGHTS) CM-DC-2010-001
HELD BY OR FOR THE BENEFIT OF A&B)
IRRIGATION DISTRICT, AMERICAN)
FALLS RESERVOIR DISTRICT #2,)
BURLEY IRRIGATION DISTRICT,)
MILNER IRRIGATION DISTRICT,)
MINIDOKA IRRIGATION DISTRICT,)
NORTH SIDE CANAL COMPANY, AND)
TWIN FALLS CANAL COMPANY)
_____)

BEFORE
HEARING OFFICER: GARY SPACKMAN
VOLUME IV

Date: June 9, 2023, 9:03 a.m.
Location: Idaho Department of Water Resources
322 East Front Street, 6th Floor

REPORTED BY:
ANDREA L. CHECK, CSR No. 748, RPR, CRR
Notary Public

A P P E A R A N C E S

for the Department of Water Resources:

Office of the Attorney General

Idaho Department of Water Resources

BY MR. PETER A. WOOD, ESQ.

322 East Front Street, Suite 648

Boise, Idaho 83720-0098

pete.wood@idwr.idaho.gov

For the City of Pocatello:

Somach Simmons & Dunn, P.C.

BY MR. MAXIMILIAN C. BRICKER, ESQ.

1155 Canyon Boulevard, Suite 110

Boulder, Colorado 80302

mbricker@somachlaw.com

For the Cities of Bliss, Burley, Carey, Declo, Dietrich,

Gooding, Hazelton, Heyburn, Jerome, Paul, Richfield,

Rupert, Shoshone, and Wendell:

McHugh Bromley, PLLC

BY MR. CHRIS M. BROMLEY, ESQ.

& MS. CANDICE M. MCHUGH, ESQ.

380 South 4th Street, Suite 103

Boise, Idaho 83702

cmchugh@mchughbromley.com

1 A P P E A R A N C E S (Continued)

2
3 For the Surface Water Coalition, Twin Falls Canal
4 Company, North Side Canal Company, and Milner Irrigation
5 District, A & B, Burley Irrigation District:

6 Marten Law

7 BY MR. JOHN K. SIMPSON, ESQ.

8 101 South Capitol Boulevard, Suite 305

9 Boise, Idaho 83702

10 jsimpson@martenlaw.com

11 For the Minidoka Irrigation District, AFRD#2:

12 Fletcher Law Office

13 BY MR. W. KENT FLETCHER, ESQ.

14 1200 Overland Avenue

15 Burley, Idaho 83318-0248

16 wkf@pmt.org

17 For the City of Idaho Falls:

18 Holden, Kidwell, Hahn & Crapo

19 BY MR. ROBERT L. HARRIS, ESQ.

20 1000 Riverwalk Drive, Suite 200

21 P.O. Box 50130

22 Idaho Falls, ID 83405

23 rharris@holdenlegal.com
24
25

A P P E A R A N C E S (Continued)

For Idaho Ground Water Appropriators, Inc.:

Racine Olson, PLLP

BY MR. THOMAS J. BUDGE, ESQ.

& MS. ELISHEVA M. PATTERSON, ESQ.

201 East Center Street

Pocatello, Idaho 83201

tj@racineolson.com

elisheva@racineolson.com

For Madison Ground Water District, Henry's Fork Ground
Water District, Jefferson Clark Ground Water District:

Rigby, Andrus & Rigby Law, PLLC

BY MR. JERRY R. RIGBY, ESQ.

25 North 2nd East

Rexburg, Idaho 83440

jrigby@rex-law.com

For Bonneville-Jefferson Ground Water District:

Olsen Taggart, PLLC

BY MR. SKYLER C. JOHNS, ESQ.

P.O. Box 3005

Idaho Falls, Idaho 83403

sjohns@olsentaggart.com

A P P E A R A N C E S (Continued)

For Bingham Ground Water District:

Dylan Anderson Law
BY MR. DYLAN K. ANDERSON, ESQ.
P.O. Box 35
Rexburg, Idaho 83440
dylan@dylanandersonlaw.com

For Twin Falls Canal Company:

Marten Law
BY MR. TRAVIS L. THOMPSON, ESQ.
163 2nd Avenue West
Twin Falls, Idaho 83301
tthompson@martenlaw.com

I N D E X

W I T N E S S E S

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

TESTIMONY OF SCOTT KING	PAGE
Direct Examination by Ms. McHugh	14
Cross-Examination by Mr. Thompson	24
TESTIMONY OF DEAN DELOREY	
Direct Examination by Ms. McHugh	27
TESTIMONY OF CHARLES BROCKWAY, Ph.D., P.E.	
Direct Examination by Mr. Thompson	35
Cross-Examination by Mr. Budge	57
Cross-Examination by Mr. Harris	102
Cross-Examination by Mr. Anderson	123
Cross-Examination by Mr. Bricker	126
Redirect Examination by Mr. Thompson	132
Recross-Examination by Mr. Harris	138
TESTIMONY OF DAVID B. SHAW, P.E.	
Direct Examination by Mr. Thompson	141
Cross-Examination by. Mr. Budge	147
Cross-Examination by Mr. Bromley	156

I N D E X

W I T N E S S E S (Continued)

REBUTTAL TESTIMONY OF MATTHEW ANDERS, P.G.

Direct Examination by Mr. Wood 171

Cross-Examination by Mr. Budge 180

REBUTTAL TESTIMONY OF BRYCE CONTOR

Direct Examination by Mr. Johns 186

Cross-Examination by Mr. Fletcher 190

Cross-Examination by Mr. Harris 193

E X H I B I T S

NO.	MARKED	RECEIVED
-----	--------	----------

SWC

2 -	***	199
-----	-----	-----

4 -	***	56
-----	-----	----

5 -	***	56
-----	-----	----

6 -	***	56
-----	-----	----

7 -	***	56
-----	-----	----

IDAHO FALLS, POCA TELLO, AND COALITION OF CITIES

317 -	***	14
-------	-----	----

348 -	***	196
-------	-----	-----

349 -	***	196
-------	-----	-----

350 -	***	196
-------	-----	-----

E X H I B I T S (Continued)

NO.	MARKED	RECEIVED
BONNEVILLE-JEFFERSON GROUND WATER DISTRICT		
502 -	***	185
504 -	***	185
505 -	***	185
506 -	***	185
515 -	***	185
McCAIN FOODS USA, INC.		
600 -	***	14
601 -	***	14
602 -	***	14
603 -	***	14
604 -	***	14
AMALGAMATED SUGAR COMPANY		
700 -	***	28
701 -	***	28
702 -	***	28
703 -	***	28
IGWA		
837A -	198	199
838 -	101	102

E X H I B I T S (Continued)

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

NO.	MARKED	RECEIVED
COMMON EXHIBITS		
900 -	***	197
901 -	***	197
902 -	***	197
903 -	***	197
904 -	***	197
905 -	***	197
906 -	***	197
908 -	***	197
909 -	***	197
910 -	***	197
912 -	***	197
914 -	***	125
928 -	***	197

P R O C E E D I N G S

1
2
3 HEARING OFFICER: The 9:00 o'clock hour has
4 arrived. Let's go on the record.

5 Okay. Are there preliminary matters we need
6 to discuss this morning?

7 MR. THOMPSON: I just have one, Director.
8 This is Travis Thompson.

9 HEARING OFFICER: Yes.

10 MR. THOMPSON: Yeah. One of our witnesses,
11 Chuck Brockway, had a procedure Tuesday. He thought he
12 would recover in time to get here, but he's still
13 feeling the effects of that. So I asked the parties
14 last night if they would stipulate to allowing him to
15 participate remotely. With your permission, he's able
16 to do that, so I'd like to bring that up.

17 HEARING OFFICER: Any objection from the
18 parties?

19 Okay. We've allowed that remote participation
20 earlier in the hearing, so I'll allow it again. It
21 causes some difficulties, but I recognize that there are
22 circumstances that may arise.

23 I also, last night, received word from
24 Sarah Klahn that she had an emergency and will not be
25 here today, so she is excused. She said that her

1 interests will be adequately represented today by
2 Mr. Bricker or others.

3 So thanks for being here, Mr. Bricker.

4 I also asked that Sarah, Andrea, and Pete Wood
5 compile a list of exhibits.

6 Have those been compiled and distributed?
7 Pete or Andrea, do you know?

8 MR. WOOD: I don't know. Let me send Sarah an
9 email. I didn't do --

10 COURT REPORTER: She's was working on it,
11 so --

12 MS. TSCHOHL: They were distributed to
13 everyone, and they should be on your desk as well.

14 HEARING OFFICER: Okay. So the parties,
15 apparently, have a list of those exhibits. And either
16 at recess or lunchtime if you could review that exhibit
17 list and ensure that the exhibits that you want received
18 into evidence at least have been offered. And any that
19 are -- have not been offered, we'll do some cleanup at
20 the end, or you can offer those as testimony as
21 presented.

22 Okay. Other matters we need to talk about?

23 The next witness?

24 MS. MCHUGH: Sorry. So many cords. Sorry.

25 MR. THOMPSON: Two for two.

1 MS. MCHUGH: Two for two. It's because I have
2 flip-flops on, and I shouldn't be wearing those.

3 HEARING OFFICER: Apparently, you're calling a
4 witness.

5 I'm glad to see you're light on your feet this
6 morning, Ms. McHugh.

7 MS. MCHUGH: I know.

8 Yes. McCain Foods would call Scott King.

9 HEARING OFFICER: Mr. King, if you'll come
10 forward.

11
12 SCOTT KING,
13 called by McCain Foods, having been first duly sworn to
14 tell the truth relating to said cause, testified as
15 follows:

16
17 HEARING OFFICER: Please be seated here.

18 MS. MCHUGH: And can the witness have
19 exhibit -- the McCain exhibit book. I think it should
20 be --

21 Is it in front of you?

22 Okay. And then also there will be exhibits --
23 the volume that includes Exhibit 317.

24 And, Mr. Director, I'll let you know, I had
25 asked the parties if they would stipulate to the

1 exhibits offered by McCain, which were Exhibits 600 --
2 well, I'll wait a minute -- Exhibit 600, which is water
3 rights for the McCain factory. In your book you should
4 have Water Rights 2749, 7130 -- oh, that's wrong --
5 2747, 2748, 2758, and 13970.

6 And just for the parties' notes, when I
7 submitted these originally, I had three additional water
8 rights included in there, and those have been removed
9 from Exhibit 600.

10 And then Exhibit 601, 602, 603, and 604, the
11 parties have agreed to have those -- to stipulate to
12 their admission.

13 And then Exhibit 317, that exhibit has also
14 been stipulated for admission.

15 HEARING OFFICER: Is the stipulation that's
16 represented by Ms. McHugh -- is the stipulation
17 accurate, and the parties agree to the --

18 MR. FLETCHER: It is, from our extent.

19 HEARING OFFICER: -- to the admission of these
20 documents?

21 MR. FLETCHER: Yes, the Surface Water
22 Coalition has stipulated.

23 HEARING OFFICER: Okay. And no objection from
24 anyone else?

25 Okay. So the documents marked as Exhibit 601

1 through 604 -- well, let's recite all of them, 601, 602,
2 603, 604, and Exhibit 317 are received into evidence.

3 MS. MCHUGH: And Exhibit 600.

4 HEARING OFFICER: Pardon me?

5 MS. MCHUGH: And Exhibit 600.

6 HEARING OFFICER: Oh, I'm sorry. That's
7 right. It started at 600. I apologize. And 600.

8 Thank you for the correction.

9 (Exhibits 600 - 604 and 317 received.)

10
11 DIRECT EXAMINATION

12 QUESTIONS BY MS. MCHUGH:

13 Q. Good morning, Scott. Candice McHugh on behalf
14 of McCain Foods.

15 Would you please state and spell your name for
16 the record.

17 A. Scott King. S-c-o-t-t, K-i-n-g.

18 Q. And would you provide a brief background as it
19 is relevant -- as it relates to today's proceeding?

20 A. I'm currently employed as a civil engineer
21 with HDR, Inc. Previously with SPF Water Engineering,
22 SPF --

23 COURT REPORTER: Okay. Slow down a little bit
24 for me. Okay?

25 THE WITNESS: Will do. Sorry. Thank you.

1 SPF Water Engineering and HDR merged about a
2 year ago, and I've been with SPF since around 2004.

3 As it relates to this hearing, I have worked
4 on water right issues for McCain Foods going back to my
5 time at SPF and continuing to HDR.

6 Q. (BY MS. McHUGH) And are you familiar with
7 McCain's groundwater rights that divert from the Eastern
8 Snake Plain Aquifer and serve the Burley facility?

9 A. Yes, I am.

10 Q. And could you look at Exhibit 600.

11 A. Yes.

12 Q. And you've been a consultant for McCain for,
13 roughly, ten years? A little over ten years?

14 A. Yes. I believe I first started working for
15 McCain Foods in late 2014.

16 Q. Does Exhibit 600 accurately show the water
17 rights that McCain Foods uses for the Burley facility --
18 currently uses for the Burley facility?

19 A. Yes.

20 Q. Are there other water rights that McCain has
21 at the Burley facility?

22 A. Yes.

23 Q. And why aren't they included in Exhibit 600?

24 A. Those ones are not being used, and I
25 understand that they're part of a mitigation plan

1 already. So they're unused water rights. McCain
2 doesn't need them.

3 Q. Is it your understanding that they're already
4 curtailed under maybe a nonused -- because of a
5 different water --

6 A. Yes. If I said "mitigation plan," I was
7 incorrect. It's unused because they're curtailed
8 because of their junior priority.

9 Q. In this particular case relative to McCain's
10 interests, what were you originally tasked with doing?

11 A. In 2014 -- currently or in 2014?

12 Q. Currently.

13 A. Okay. I was tasked with providing technical
14 analysis of McCain's water use as it related to
15 developing a mitigation plan to address shortfalls in
16 curtailment due to the Surface Water Coalition call.

17 Q. And when did you start working on that task
18 with McCain?

19 A. That was March of this year.

20 Q. And why did you start working on it in March
21 of this year? Do you know?

22 A. That's when I was asked to begin working on
23 it.

24 Q. Are you aware of the proposed curtailment date
25 that's pending on the aquifer back to December 31st,

1 1953?

2 A. Yes.

3 Q. And when you learned that as a consultant with
4 McCain, what was the response to that?

5 A. We had conversations. We met and discussed
6 the plans that we had considered for mitigation before
7 and were trying to develop alternatives to meet this
8 deadline, this date.

9 Q. And when did you learn of the proposed
10 curtailment back to 1953?

11 A. Sometime late in April.

12 Q. And did you assist McCain in figuring out what
13 to do in response to that curtailment date?

14 A. Yes.

15 Q. Could you look at Exhibit 601.

16 A. Yes.

17 Q. And could you identify that document?

18 A. This is a letter from McHugh Bromley, your law
19 office, to Southwest Irrigation District petitioning to
20 join the district for mitigation purposes.

21 Q. And what happened after that letter was sent
22 to Southwest Irrigation District?

23 A. The district accepted the petition and allowed
24 McCain to join the district for mitigation purposes.

25 Q. And why did McCain decide it needed to send a

1 letter to Southwest Irrigation District rather than
2 continue your work on developing its own mitigation
3 plan?

4 A. We didn't have sufficient time to develop
5 McCain's own plan, so Southwest Irrigation District was
6 the best alternative to meet that deadline.

7 Q. Was it your understanding there was a deadline
8 that McCain had to meet in order to avoid curtailment
9 this season?

10 A. Yes.

11 Q. Do you remember what that date was?

12 A. I think that was May 5th.

13 Q. And was that based on an order by the
14 Director?

15 A. Yes.

16 Q. Once the letter was sent to Southwest
17 Irrigation District and they accepted McCain within
18 their boundary, do you know what happened next?

19 A. That I believe you notified the Department of
20 Water Resources that McCain Foods had been accepted into
21 Southwest for mitigation purposes.

22 Q. Can you look at Exhibit 602.

23 A. Yes.

24 Q. Can you identify that document.

25 A. Yes. This is your notice of mitigation to the

1 Department of Water Resources that McCain Foods was
2 accepted into Southwest Irrigation District for
3 mitigation.

4 And in the last paragraph they're requesting
5 some kind of acknowledgment from the Department of Water
6 Resources that they had been accepted.

7 Q. Okay. And if you could turn to Exhibit 603.

8 A. Okay.

9 Q. Have you seen that document before?

10 A. Yes.

11 Q. And what is that document?

12 A. This is an email from Garrick Baxter to you
13 acknowledging that IDWR understands that these four
14 McCain Foods water rights that were in Exhibit 600 were
15 brought into Southwest Irrigation District for
16 mitigation.

17 Q. And what is your understanding of what will
18 happen if Southwest Irrigation District is not in
19 compliance with their mitigation plan?

20 A. Part of this email also states: "So long as
21 Southwest Irrigation District is in compliance with its
22 approved mitigation plan, the four rights should be
23 protected from curtailment."

24 So I would understand, there, if Southwest is
25 not in compliance, that it could mean that McCain Foods

1 could be curtailed.

2 Q. Does McCain have any water rights senior to
3 December 31st, 1953?

4 A. No.

5 Q. And do you have an understanding of what would
6 happen if McCain did not have any water rights -- valid
7 water rights at its Burley facility?

8 A. My understanding that McCain Foods would not
9 be able to operate without having water.

10 Q. And throughout this process, has McCain had
11 any concern about the process relative to understanding
12 when the curtailment date was announced and being able
13 to protect its water rights?

14 A. Yes, that there was insufficient time to
15 develop their own mitigation plan to meet the deadline.

16 Q. Was McCain Foods' interest in developing its
17 own mitigation plan its first priority, or was it -- how
18 did that work?

19 A. McCain Foods wanted to have their own
20 mitigation plan that they would be in control of.

21 Q. Do you know whether McCain can or could
22 mitigate for its own groundwater pumping for itself?

23 A. I believe that they could develop a mitigation
24 plan to operate on their own, to have their own
25 mitigation plan, but we have not been able to construct

1 that by this deadline.

2 Q. Can I have you look at Exhibit 317.

3 A. Yes.

4 Q. Have you seen that document before?

5 A. Yes.

6 Q. And can you tell me what that document is.

7 A. This is a FAQ document that's on the
8 Department of Water Resources front page address,
9 "Surface Water Coalition delivery call and the Amended
10 5th Methodology and April 2023 As-Applied Orders."

11 Q. And can you turn to the -- I think it's the
12 last page in that; I think it's page 3. It's a
13 three-page document.

14 A. Yes.

15 Q. And do you see where that document discusses
16 what would happen if you're a food producer and were
17 under a mitigation plan or if you're a food producer
18 without a mitigation plan?

19 And then I think the last paragraph says, "Can
20 I file my own mitigation plan?"

21 Do you see that?

22 A. Yes.

23 Q. Can you read the last paragraph, question and
24 answer.

25 A. The question: "Can I submit a mitigation plan

1 now and get it approved in time for this coming
2 irrigation season?"

3 And the answer is: "It is unlikely that a
4 mitigation plan can be approved before a potential
5 curtailment order is issued. Once a plan is submitted,
6 the plan must be advertised and is then subject to
7 protest deadline. The plan is subject to hearing if
8 protested or if the Director determines a hearing is
9 necessary. This process can take many months."

10 Q. Can you turn to Exhibit 604.

11 A. Yes.

12 Q. Have you seen that document before?

13 A. Yes.

14 Q. Can you tell me what it is.

15 A. "This is the Notice of Possible Curtailment
16 Call for Groundwater Rights with Priority Dates Junior
17 to December 30th, 1953 - Surface Water Coalition
18 Delivery Call," dated May 1, 2023.

19 Q. Is it your understanding that this is the
20 letter that McCain received at its Burley facility?

21 A. Yes.

22 Q. I believe towards the end of that document --
23 I think it's in bold and it may be underlined -- it says
24 something along the lines that "during the consideration
25 of the mitigation plan, curtailment will not be stayed."

1 Do you see that?

2 A. No, I don't. I'll have to read this. What
3 was it?

4 MS. MCHUGH: I'm sorry, can I approach the
5 witness, Director?

6 Q. (BY MS. MCHUGH) It's the end of the fifth
7 paragraph.

8 A. Okay. Gotcha. I was looking at the last
9 paragraph.

10 Q. If you would look at the fifth paragraph
11 there.

12 A. Yes.

13 Q. Can you read the last, I think, three
14 sentences.

15 A. Yes. Beginning about halfway through this
16 paragraph: "Upon receipt of a proposed mitigation plan,
17 the Director will publish notice for two successive
18 weeks, after which ten days will be allowed for the
19 filing of protests. The Director may hold a hearing if
20 necessary to determine whether a proposed mitigation
21 plan will mitigate an injury to the SWC," Surface Water
22 Coalition, "caused by diversions of groundwater
23 authorized by junior priority groundwater rights. If
24 the proposed mitigation plan is protested, the Director
25 will hold a hearing. Please be advised that a

1 curtailment order is not stayed pending evaluation of a
2 mitigation plan."

3 Q. Was it your understanding as a consultant for
4 McCain Foods and McCain's understanding that if they
5 filed a mitigation plan, that they would still be
6 subject to the curtailment order?

7 A. Yes.

8 Q. And do you know when that May 1st letter was
9 received at the Burley facility from McCain?

10 A. I understand McCain received that on May 12th.

11 MS. MCHUGH: I have no further questions.

12 HEARING OFFICER: Other questions of Mr. King
13 from the groundwater users?

14 Cross-examination?

15 MR. FLETCHER: I don't have any.

16 MR. SIMPSON: No.

17 MR. THOMPSON: I've got one.

18 HEARING OFFICER: Thank you, Mr. King --
19 Mr. Simpson.

20 Mr. Thompson, do you have some questions?

21
22 CROSS-EXAMINATION

23 QUESTIONS BY MR. THOMPSON:

24 Q. Good morning, Mr. King.

25 A. Good morning.

1 Q. Travis Thompson for A&B Irrigation District,
2 et al.

3 A. Good morning.

4 Q. Just one question -- a couple questions.

5 Ms. McHugh asked you about timing of when
6 McCain's could file a mitigation plan this spring.

7 Do you recall that?

8 A. Yes.

9 Q. Has McCain Foods attempted to file a
10 mitigation plan anytime in the past?

11 Do you know?

12 A. Under this delivery call, not that I'm aware
13 of.

14 Q. Anything that would prevent them from
15 submitting a plan prior to this spring?

16 A. The only thing that I think that might prevent
17 them is knowing what they need to submit the mitigation
18 plan for, the details, the requirements of what they're
19 mitigating.

20 Q. As far as the priority date?

21 A. Yes.

22 Q. I guess any of their rights junior to '53,
23 would they have any reason to put a plan together before
24 this year?

25 A. We weren't aware of what priority date would

1 require a mitigation plan, so -- and we didn't have
2 water rights -- the 1953 date is new.

3 Q. Are they aware of the Surface Water
4 Coalition's priority dates for their senior surface
5 water rights?

6 A. I assume that they are, yes.

7 MR. THOMPSON: Thank you.

8 HEARING OFFICER: Any more cross-examination?
9 Redirect, Ms. McHugh?

10 MS. MCHUGH: No.

11 HEARING OFFICER: Thank you, Mr. King.

12 Next witness?

13 MS. MCHUGH: Amalgamated Sugar Company would
14 call Dean Delorey.

15 HEARING OFFICER: Mr. Delorey, if you would
16 come forward, please.

17 Would you raise your right hand.

18
19 DEAN DELOREY,

20 called by Amalgamated Sugar Company, having been first
21 duly sworn to tell the truth relating to said cause,
22 testified as follows:

23
24 HEARING OFFICER: Thank you. Please be
25 seated.

1 Ms. McHugh.

2
3 DIRECT EXAMINATION

4 QUESTIONS BY MS. MCHUGH:

5 Q. Thank you. Good morning, Mr. Delorey.

6 A. Good morning.

7 Q. Could you state and spell your name for the
8 record, please.

9 A. Yes. Dean Delorey, D-e-a-n, D-e-l-o-r-e-y.

10 Q. And, Mr. Delorey, have you ever been a witness
11 in a judicial or administrative proceeding before?

12 A. No.

13 Q. Would you briefly explain your position at
14 Amalgamated Sugar Company?

15 A. Yes, I'm the director of environmental
16 affairs. My primary focus is on environmental
17 compliance. I've worked with the company for over
18 30 years. I'm familiar with the -- each of our sugar
19 beet processing facilities, and so my primary work is
20 environmental compliance.

21 Q. Are you familiar with Amalgamated Sugar's
22 groundwater rights that divert from the Eastern Snake
23 Plain Aquifer for one of its beet processing facilities?

24 A. Yes, I'm familiar with the Mini-Cassia
25 facility.

1 MS. MCHUGH: And, Mr. Director, I probably
2 should have done this before I started my examination,
3 but you should have in front of you exhibits for
4 Amalgamated Sugar Exhibits 700, 701, 702, and 703, and
5 the parties have stipulated to the admission of those
6 four exhibits.

7 HEARING OFFICER: Based on Ms. McHugh's
8 statement that the parties have stipulated the admission
9 of these documents, I will receive the documents marked
10 as Exhibits 700, 701, 702, and 703 into evidence.

11 (Exhibits 700 - 703 received.)

12 Q. (BY MS. MCHUGH) And so you are saying that
13 you are familiar with the water rights for the
14 Mini-Cassia facility that Amalgamated Sugar operates?

15 A. That's correct.

16 Q. Would you just generally tell me where that's
17 located?

18 A. The Mini-Cassia facility?

19 Q. Yes.

20 A. The Mini-Cassia facility is located just
21 outside Paul, Idaho.

22 Q. And if you look at Exhibit 700 in the binder
23 in front of you.

24 A. Yes.

25 Q. Does that exhibit accurately show the water

1 rights for the Mini-Cassia factory except for the small
2 domestic rights that are not subject to curtailment?

3 A. Yes.

4 Q. Are you aware of the proposed curtailment of
5 the aquifer back to December 31st, 1953?

6 A. Yes.

7 Q. And what was Amalgamated's response when they
8 learned that there was a potential curtailment back to
9 December 31st, 1953?

10 A. Well, our initial response was to get legal
11 involved. We've hired -- we've worked with you, and
12 you're our groundwater expert and water rights expert,
13 so that was our initial response. And I understand
14 based on the initial response was for us to join the
15 Magic Valley Ground Water District and see if we could
16 be covered under their mitigation plan.

17 Q. If you could look at Exhibit 701.

18 Do you recognize this letter?

19 A. Yes.

20 Q. And what is it?

21 A. This is a letter requesting to allow
22 Amalgamated to join the Magic Valley Ground Water
23 District as a mitigation-only member.

24 Q. Was there any consideration of Amalgamated
25 trying to develop its own mitigation plan, or was the

1 only option to look at Magic Valley?

2 A. We just haven't had time to look at our own
3 mitigation plan, so this was the most efficient way of
4 getting covered under a mitigation plan.

5 Q. And what happened after this letter was sent
6 to Magic Valley Ground Water District?

7 A. We were just awaiting response from -- to find
8 out if we would be part of the Magic Valley Ground Water
9 District.

10 Q. And did they respond?

11 A. Yes.

12 Q. And if you would look at Exhibit 702.

13 In addition to some other things, could you
14 explain what Exhibit 702 does relative to Amalgamated's
15 enrollment in Magic Valley Ground Water District?

16 A. The primary purpose of this is a request to
17 IDWR for notice of mitigation and for us to be covered
18 under the Magic Valley Ground Water District and their
19 approved mitigation plan.

20 Q. And would you look at Exhibit 703.

21 Have you seen this document before?

22 A. Yes.

23 Q. And what is it?

24 A. This is a response from IDWR stating that
25 Amalgamated could be part of the Magic Valley Ground

1 Water District.

2 Q. And what is your understanding of what will
3 happen if Magic Valley Ground Water District is not
4 found to be in compliance with their mitigation plan?

5 A. There's potential for curtailment of our
6 junior water rights.

7 Q. And Amalgamated has a couple water rights that
8 are senior -- if you look back at Exhibit 700 --

9 A. Yes.

10 Q. -- that are senior to the December 31st, 1953,
11 priority date.

12 What would Amalgamated -- what would happen to
13 Amalgamated's operation at Mini-Cassia if it lost its
14 water rights junior to the 1953 date?

15 A. Well, I would just say this -- are you saying
16 the junior or the senior?

17 Q. I'm saying: What would happen if you lost
18 your -- the water rights junior to 1953?

19 A. Well, we would -- to be honest, we just need
20 time to evaluate or do a water balance to understand
21 what -- how it would impact our facility.

22 So we would have to have -- I'd have to have
23 discussions with the plant manager there to know what --
24 in terms of what that potential -- if there would be any
25 potential issues, so...

1 Q. And Amalgamated hasn't had -- hasn't done that
2 yet or is in the process of doing that, I suppose,
3 because it takes some time because the water use in your
4 facility is pretty complex?

5 A. Yeah. The water balances are complex, so we
6 just need the time to be able to evaluate the overall
7 water balance in term of groundwater usage.

8 Q. And --

9 COURT REPORTER: Can you guys please slow down
10 for me.

11 THE WITNESS: Oh, sorry.

12 Q. (BY MS. McHUGH) And when did Amalgamated
13 become aware of the December 31st, 1953, curtailment
14 date?

15 A. That was back in early May.

16 Q. And did you understand that there was a
17 deadline that you needed to comply with at that time?

18 A. Yeah. Talking with you, I understand there's
19 a deadline, yes.

20 Q. Okay. And was there any time for Amalgamated
21 to evaluate its own mitigation plan and the impact of
22 the curtailment date on its operations?

23 A. We haven't had time to evaluate a mitigation
24 plan.

25 Q. Okay. And you're in the process of

1 understanding kind of how to react to curtailed water
2 use, potentially?

3 A. Yeah. Based on my understanding and my short
4 course on water rights, we would likely hire someone to
5 assist us with a mitigation plan.

6 Q. And what is your understanding of whether
7 Magic Valley Ground Water District is in compliance with
8 its mitigation plan?

9 A. Magic Valley is not in compliance with their
10 mitigation plan. And, likely, we need to put together a
11 mitigation plan as a corrective measure.

12 Q. I guess what I was asking is: What's your
13 understanding of whether Magic Valley Ground Water
14 District is in compliance with its mitigation plan?

15 Do you know whether it's in compliance or not?

16 A. I guess, based on my discussions with you, I'm
17 not sure that it's going to be approved. And they may
18 not be in compliance with their plan.

19 MS. MCHUGH: I have nothing further.

20 HEARING OFFICER: Cross-examination?

21 Nothing?

22 Okay. Thank you.

23 THE WITNESS: Thank you. Appreciate it.

24 HEARING OFFICER: Next witness?

25 Are we shifting now? Are these Surface Water

1 Coalition witnesses that are being called?

2 MR. THOMPSON: Director, I think we'd call
3 Chuck Brockway next. We might take a minute off the
4 record to get it set up.

5 HEARING OFFICER: Let's go off the record for
6 a moment.

7 (Break taken.)

8 HEARING OFFICER: Back on the record.

9 So we're back on the record, and it appears
10 that Mr. Brockway is ready. And I think when you start
11 to question him and he responds, Mr. Thompson, perhaps
12 we'll see his full image on-screen.

13 Mr. Thompson, you -- oh, I need to swear him
14 in, I forget, as they are online.

15 Mr. Brockway, if you'll stand, please, if you
16 can, and raise your right hand.

17 Thank you.

18

19 CHARLES BROCKWAY, Ph.D., P.E.,
20 called by the Surface Water Coalition, having been first
21 duly sworn to tell the truth relating to said cause,
22 testified remotely as follows:

23

24 HEARING OFFICER: Thank you. Thanks for
25 audibly responding.

1 Mr. Thompson, you may question Mr. Brockway.

2
3 DIRECT EXAMINATION

4 QUESTIONS BY MR. THOMPSON:

5 Q. Good morning, Chuck.

6 Can you hear me okay?

7 A. Good morning, Travis. I can hear you. I
8 can't see you, though.

9 Q. Okay. That's probably better for you.

10 A. That's fine with me.

11 Q. Can you please --

12 HEARING OFFICER: Just a minute.

13 Why is that? Do we know?

14 MS. TSCHOHL: I believe our signal is just a
15 little bit weak, so it's prioritizing audio.

16 HEARING OFFICER: Okay. Well, we can see
17 Brockway. But anyway, let's -- we'd rather see the
18 witness than Mr. Thompson anyway; right?

19 MR. THOMPSON: Absolutely.

20 HEARING OFFICER: All right. Here we go.

21 Q. (BY MR. THOMPSON) Chuck, can you please state
22 and spell your name for the record.

23 A. Charles G. Brockway; C-h-a-r-l-e-s, G.,
24 B-r-o-c-k-w-a-y.

25 Q. And where do you work?

1 A. Brockway Engineering.

2 Q. And what is your current occupation?

3 A. Civil engineer and owner of the company.

4 Q. Is your CV attached to what's been marked the
5 Surface Water Coalition Exhibit 4?

6 A. Yes.

7 Q. And does that generally describe your
8 education and work history?

9 A. Yes.

10 Q. Have you been qualified as an expert witness
11 before IDWR in prior cases?

12 A. Yes.

13 Q. Can you generally describe what Exhibit 4 is.

14 A. It's an expert report that was prepared by
15 myself as well as Erick Powell, who also works for
16 Brockway Engineering, and Dave Shaw, ERO, relative to
17 the Fifth Methodology Order and the As-Applied Order.

18 Q. And can you just generally describe what you
19 were asked to do for that report.

20 A. We were asked to review the Fifth Methodology
21 Order and the As-Applied Order and provide technical
22 comments on those orders primarily as it relates to
23 irrigated area, project efficiencies, and the baseline
24 year.

25 Q. And it looks like this report is broken up

1 into parts by letters; is that correct?

2 A. Correct.

3 Q. And I'll try to just walk through some of
4 these parts with you.

5 Could you please summarize your opinion for
6 Part A, describe what that is?

7 A. So Part A has to do with a comparison of the
8 project irrigated areas that the Twin Falls Canal
9 Company utilized in the Fifth Methodology relative to
10 the other members that are out there, primarily the 2011
11 and the 2017 products that IDWR has set forth based on
12 the irrigated lands dataset.

13 So we did a GIS comparison of those three
14 shapefiles. I'll call them the methodology acres, the
15 2011 acres, and the 2017 acres. Rasters filed were
16 provided by IDWR for those --

17 COURT REPORTER: Okay. What kind of files?
18 Can you repeat that? What kind of files were provided?

19 THE WITNESS: Raster files, r-a-s-t-e-r.

20 COURT REPORTER: Okay. You can keep going.
21 Just maybe slow down a little bit.

22 THE WITNESS: All right.

23 Raster files were provided by IDWR.
24 Shapefiles were created in ArcMap. The shapefile files
25 were intersected to determine their differences.

1 And we found that the 2011 and 2017 shapefiles
2 were nearly identical, so we focused on the 2017
3 difference shapefile. And we, to the extent we could,
4 explored the reason for the differences between the 2017
5 shapefile and the methodology shapefile for the
6 Twin Falls Canal Company.

7 So we found that there were a number of
8 factors that entered into the differences between those
9 two shapefiles, and those are outlined in the report:
10 Primarily ditches, ponds, other waterways that were
11 taken out in the '17; there were fields that were not,
12 apparently, irrigated in the 2017 photo; some pivot
13 corners that, apparently, were not irrigated.

14 And then the other primary category would be
15 developed areas around the fringe of municipalities, as
16 well as roadways.

17 So that's what we did for Part A.

18 Q. (BY MR. THOMPSON) And, Chuck, can you turn to
19 Exhibit 5.

20 Do you have that?

21 A. Yes.

22 Q. And can you generally describe that, for the
23 record?

24 A. So this is an exhibit that shows the acreage
25 comparison between the 2017 and the methodology acres.

1 The red line is the Twin Falls Canal Company service
2 area, and the blue lines in that map are the differences
3 between the 2017 acres and the methodology acres.

4 Q. And is there a date for the photo that this is
5 overlaid on?

6 A. It's the 2021 aerial photo.

7 Q. If you could turn to Exhibit 6 -- or is there
8 anything else on Exhibit 5?

9 A. No.

10 Q. Could you please describe Exhibit 6, for the
11 record.

12 A. Exhibit 6 is just an example of where the 2017
13 irrigated area shapefile omits some fields that are
14 definitely irrigated. So this is not meant to be a
15 comprehensive analysis by any means. We simply pulled a
16 snippet from a section of the shapefile to illustrate
17 that there's a half-pivot that was omitted from the '17
18 shapefile and a small field on the right side of the map
19 that was also omitted.

20 Q. And does this exhibit depict what could be
21 waterways or canals that have been taken out as well?

22 A. It does, yes.

23 Q. Can you describe Exhibit 7, for the record,
24 please.

25 A. Exhibit 7, again, is a snippet that we pulled

1 from the overall shapefile just as an example, not meant
2 to be comprehensive of another problem that we found
3 with the 2017 and the 2011 shapefiles, which is that
4 there are registration differences between the '17 and
5 the methodology shapefile. And by that -- when I say
6 "registration," by that I mean the rectification of the
7 aerial photo with the section lines.

8 And what you see there, there is a shift. And
9 so what that results in is a -- an inconsistency in the
10 acres delineation. Because there are roadways that were
11 rightly removed in the 2013 Methodology delineation and
12 roadways that were rightly removed in the 2017
13 delineation. However, in the 2017 delineation they were
14 not added back in, so we have a double-counting of
15 acreages that are removed.

16 Q. Now, turn your attention to the left side of
17 that exhibit -- I guess the -- I'll call it the west
18 side of the map if we're looking north.

19 A. Yes.

20 Q. Do you see a number of thin yellow lines
21 horizontal in between the fields.

22 Do you see those?

23 A. Yes.

24 Q. Do you know what those may be depicting?

25 A. Those are likely --

1 COURT REPORTER: Can you start your answer
2 over again? Because I had trouble hearing.

3 THE WITNESS: Those are likely depicting waste
4 ditches that were present when these areas were
5 gravity-irrigated. And now that it's been converted to
6 a center pivot, those ditches are not there.

7 Q. (BY MR. THOMPSON) And over to the southeast
8 side of that exhibit, I see some curved yellow lines.

9 Do you have an idea what those might be
10 depicting?

11 A. Those are likely depicting, again, ditches or
12 laterals that were removed in the 2017 delineation.

13 Q. Chuck, in your opinion, is it appropriate to
14 remove ponds and waterways and consider them to have no
15 consumptive use?

16 A. No, not in terms of demand, because a canal
17 and a lateral and a ditch all evaporate from the water
18 surface and have evapotranspiration from the vegetation
19 on the ditch banks, and those are real consumptive
20 demands that have to be met by the project diversion.

21 Q. So even if that is not an irrigated acre,
22 would that still be considered a use or a demand of the
23 water diverted from the Snake River?

24 A. Yes.

25 Q. I'd like to turn back to Exhibit 4, Part B. I

1 think it begins at page 6.

2 A. Travis, if you wouldn't mind, if I could just
3 hit one more thing on Part A before we leave that.

4 Q. No, go ahead.

5 A. Well, one primary category of areas that are
6 removed from the 2017 delineation are developed areas
7 around the fringe of municipalities. These represent,
8 typically, rural or semirural subdivisions on the edges
9 of cities that are being developed. I think there are
10 just some comments to keep in mind relative to that.

11 One is that these subdivisions are entitled to
12 the same share delivery as the agricultural field was
13 prior to the development. So the canal company has to
14 be prepared to meet that same demand, even though the
15 area is being developed and the actual irrigated acreage
16 is going down. So while the consumptive use may be
17 going down, the demand will usually not. And this is
18 just a function of the nature of small residential
19 developments.

20 Water use occurs in these developments at a
21 much higher rate over a shorter period. So to even get
22 the demand to stay the same as it was with the
23 agricultural use, you have to enforce a strict rotation.
24 So I think that's just an important demand side of the
25 equation to keep in mind relative to subdivision

1 developments.

2 Q. At least in Twin Falls County, are you aware
3 of requirements when land is developed to retain surface
4 water for continued irrigation use?

5 A. Yes. The City of Twin Falls has that
6 ordinance.

7 Q. If we could turn to Part B, page 6.

8 A. Okay.

9 Q. Can you generally describe what you reviewed
10 and what this part addresses?

11 A. This section describes a statistical analysis
12 of the annual water diversions for the Twin Falls Canal
13 Company from Water District 1 adjusted for wheeled or
14 recharge water for the years 2000 through 2021.

15 Figure 4 in our report shows those data points
16 as well as a statistical trend line calculated for the
17 data. In order to assess whether there was a trend in
18 the data, we subject the data to a Mann-Kendall
19 analysis -- that's M-a-n-n, dash, K-e-n-d-a-l-l -- to
20 determine if there was a statistically significant trend
21 in the data, and we found that the data shows that there
22 was no trend.

23 And let me clarify something I said earlier.

24 The whole dataset was from 1977 through 2022,
25 but the wheeled and recharge adjustments were only from

1 2000 through 2021 --

2 COURT REPORTER: Wait, wait. I apologize,
3 Mr. Brockway. I couldn't hear that very well, so, "The
4 whole dataset was from 1977 through 2022, but the
5 wheeled and recharge adjustments were only from"?

6 THE WITNESS: 2000 through 2021.

7 I'm sorry, I'll speak more clearly.

8 Q. (BY MR. THOMPSON) Anything else on that part
9 before we move on, Chuck?

10 A. No, Travis, other than just to make the
11 observation that when you do a trend analysis, it's
12 important to be very careful because the period that is
13 selected for analysis can have a strong influence on
14 whether or not a trend is detected. So, for example, if
15 one were to use the period 2005 through the current, the
16 analysis would likely show a trend upward. If one were
17 to use the period 1990 through 2005, it would likely
18 show a trend downward. So we felt that in order to get
19 the full picture of what was happening to the Twin Falls
20 Canal Company demands, we used the entire period of
21 record.

22 Q. That period would capture years of above
23 average water supply and below; is that correct?

24 A. That is correct.

25 Q. I'd like to turn to Part D, page 11.

1 Could you generally describe that section and
2 what you looked at?

3 A. Part D was a general exposition on factors
4 that affect project efficiency in any canal company but
5 in particular large canal companies like the Twin Falls
6 Canal Company.

7 And, again, just to restate what has been
8 stated before, the project efficiency is defined as the
9 crop water need, which is the consumptive irrigation
10 requirement times the irrigated acres divided by the
11 adjusted diversion. And the Fifth Methodology Order
12 spells that out.

13 The project efficiency is a lumped parameter
14 that essentially accounts for all of the operational
15 water requirements that are needed for -- to operate the
16 project but that do not directly go toward meeting the
17 evapotranspirative demand of the crop.

18 So for a large company, these would, of
19 course, start with the on-farm efficiency, which ranges
20 from roughly 50 percent for gravity methods to roughly
21 80 to 85 percent for a high-efficiency center pivot
22 system. Then you, typically, have a significant amount
23 of canal seepage or conveyance loss, which varies from
24 project to project but may range from 20 to 30 percent
25 of the total diversion.

1 Related to that, you have the required wetting
2 of the canal system that has to occur during the spring,
3 the initial startup of the project when the canal beds
4 are dry.

5 Another big factor in a large company is the
6 operational spill. And I think we heard Jay Barlogi
7 testify to this earlier. This is always necessary to --
8 in order to deliver water to users within the system,
9 particularly those near the tail end of the system.

10 That spill has to be maintained in order to
11 allow the buffering, if you will, for variations in
12 demand by irrigators on the system. If you don't have
13 that spill, you won't be able to reliably serve the tail
14 ends of the system.

15 Another big factor is variations in
16 meteorological conditions which affect on-farm demand by
17 irrigators. For example, if a cool, rainy period comes
18 in, that could lead to rapid decreases of on-farm demand
19 as irrigators turn off, but that doesn't mean that a
20 large canal company can simply reduce its diversion at
21 the river. If it tried to do that, if it tried to
22 follow every little variation and meteorological demand,
23 then when the ordinary warm weather returned, they
24 wouldn't be able to ramp up quick enough to meet that
25 demand of returns. It's only if that cool period were

1 sustained for, you know, a number of days, maybe weeks
2 that the project diversions could, potentially, be
3 adjusted.

4 The other factor in project efficiency that's
5 been talked a lot about is the conversion to sprinkler
6 irrigation, which has happened across the plain,
7 including on the Twin Falls Canal Company. And I think
8 we heard some testimony that the current estimated
9 sprinkler irrigation percentage on the Twin Falls Canal
10 Company is about 50 to 60 percent.

11 So the important thing to keep in mind on
12 sprinkler conversion is that it always leads to an
13 increase in on-farm efficiency; that is, a center pivot
14 system will, as a general statement, but will be more
15 efficient than a gravity irrigation system. However,
16 that does not always, necessarily, translate to an
17 increase in overall project efficiency for a large
18 system. And there are two general reasons for that.

19 One is a sprinkler irrigation farm has more of
20 an on/off demand structure as opposed to a more
21 continuous demand for a gravity irrigation system. So
22 the canal company has to be prepared to deal with that
23 on/off situation. So they have to maintain,
24 essentially, the same diversion in the canal that they
25 had before. And this goes, again, back to the

1 operational spill requirement.

2 The second factor, which is not unique to
3 Twin Falls but it certainly occurs, to a great extent,
4 on the Twin Falls Canal Company system, is that
5 conversion to sprinkler irrigation results in a
6 reduction of incidental recharge from irrigation, which
7 leads to a reduction in drain flows that are relied upon
8 for redelivery. So with gravity methods, there's a lot
9 of irrigation infiltration, a lot of subsurface storage
10 that occurs, drain flows are sustained, and that water
11 is released later in the season. And that drain water
12 is treated as project water that can be rediverted to
13 meet obligations downstream and, again, potentially
14 later in time.

15 So if there's -- if that drain flow goes down,
16 that water that can't be rediverted has to be made up
17 from somewhere, and so it has to come from a river.

18 So -- and this is all very case-specific, of course, but
19 in the Twin Falls Canal Company tract, when irrigation
20 began -- or since irrigation began, the groundwater
21 levels have increased, you know, from a low of 20 to
22 30 feet up to more than 100 feet in some areas.

23 And so that resulted in waterways flowing that
24 ordinarily didn't flow. It augmented existing perennial
25 streams. It created seeps and springs that didn't exist

1 before. And it created -- or it necessitated the
2 development of hundreds and hundreds of drain tiles and
3 seep tiles to lower the water table and capture that
4 water and redivert it downstream.

5 So that's a factor that has to be taken into
6 account in the Twin Falls Canal Company tract. And it
7 is too simplistic just to say, well, diversion to
8 sprinkler automatically must lead to a commensurate
9 increase in project efficiency.

10 Finally, the other big factor in any big canal
11 company is that in the shoulders of the irrigation
12 system, efficiencies naturally tend to be low. So when
13 the water is turned on in April, a major amount of water
14 is needed to charge the system, to fill the canals, and
15 that may take several days.

16 Similarly, that high initial seepage rate in
17 the canals has to be overcome. During this time the
18 crop water need is relatively low and so the overall
19 project efficiency is, therefore, very low.

20 Similarly, in the late season, say in October,
21 crop water need is lower, but the water is still in the
22 canal system in order to convey the water to the end of
23 the system to meet those tail end delivery obligations.
24 Those don't go away just because we're in the tail end.

25 And my understanding and my reading of the

1 Fifth Methodology Order is that it does incorporate some
2 provisions to ensure that the reasonable in-season
3 demand is not underestimated in April or overestimated
4 in October.

5 So I'm sorry, that's a very lengthy
6 explanation of what we did, but it was just an overview
7 of all the factors that have to be taken into account
8 for a large canal company much beyond simple on-farm
9 efficiency and conveyance losses.

10 Q. Do you have any other comments about
11 challenges with project efficiency in large open canal
12 systems, or does that pretty much cover it?

13 A. I think that pretty much covers it.

14 Q. Would you agree that changes in irrigated
15 acres is not the only factor that would affect canal
16 project efficiency?

17 A. Yes.

18 Q. Chuck, could you look at Part F, beginning at
19 page 13. Can you generally describe that opinion?

20 A. Yes. So in Part F, we looked at the effect of
21 an irrigated area reduction on the reasonable in-season
22 demand as calculated in the methodology order.

23 Now, obviously, as a general principle, if
24 there are fewer acres irrigated, everything else being
25 equal, you would need to divert less for those acres.

1 However, in the methodology, the diversion demands are
2 taken as a given whatever the acres may be for a
3 project. Those diversions and those acres are used to
4 then calculate the project efficiencies -- again, as the
5 consumptive irrigation requirement times the acres
6 divided by the diversion. Then those project
7 efficiencies are used to calculate the reasonable
8 in-season demand adjustments.

9 So, again, it's -- the diversions -- the
10 actual observed diversions are taken as a given. So if
11 the -- say the -- for example, the true acres, if we
12 knew that, were 5 percent lower, then the project
13 efficiencies would also be 5 percent lower, and the
14 reasonable in-season demand adjustments, in theory,
15 wouldn't change.

16 Now, I had time to look into the guts of the
17 reasonable in-season demand spreadsheet to see what it
18 may actually be doing, but what I just described is an
19 accurate statement of the equations that are found in
20 the Fifth Methodology Order.

21 And then, of course, the baseline year demand
22 doesn't depend on acres at all, it's simply a selection
23 of a year from, again, actual observed conditions --
24 sorry -- actual observed diversions.

25 So I don't think it's valid to simply say,

1 well, if your true acres are 5 percent less than what
2 you say they are, your demands ought to be 5 percent
3 less. The equations and the methodology are not set up
4 that way.

5 Q. So removing one irrigated acre would not
6 automatically equal a reduction in that amount of water
7 needed to divert at the river?

8 A. Correct.

9 Q. Anything else on that before I turn to Part G?

10 A. No.

11 Q. Could you generally describe the -- what was
12 offered at Part G on page 14 of your report?

13 A. Well [unintelligible] --

14 COURT REPORTER: Mr. Brockway, can you start
15 your answer over again.

16 THE WITNESS: Part G talks about supplemental
17 groundwater usage, which is the usage of private wells
18 for supplemental purposes on surface water irrigated
19 lands, which does occur within the Surface Water
20 Coalition members' service areas and within the
21 Twin Falls Canal Company service area.

22 The percentage of land in the Twin Falls Canal
23 Company service area is -- that is served by
24 supplemental wells, in my experience, is fairly low due
25 to the overall reliability of the surface water supply

1 within the company.

2 A couple of things that should be taken into
3 account when determining -- or evaluating the effect of
4 supplemental groundwater usage:

5 One is that these groundwater supply systems,
6 in my experience, on a particular farm, they are rarely
7 nice, clean-cut, stand-alone systems. They're always
8 hydraulically interconnected with the surface water
9 supply systems somehow. There's usually multiple
10 fields, multiple pumps and booster pumps and application
11 systems that may be interconnected and used in some
12 complicated and sometimes mysterious fashion that's only
13 known to the irrigator.

14 And so, really, it's hard to assess -- to make
15 an accurate assessment of the degree to which
16 groundwater usage is employed. Really, to do it right,
17 you'd almost have to ground truth each individual system
18 of the farm operator.

19 The second point to make is that, similarly to
20 what I said in the previous section, if you could
21 quantify an acreage or an equivalent acreage, if you
22 will, of land that was supplied by groundwater, that
23 could, potentially, reduce the number of acres that are
24 irrigated with surface water.

25 But, again, since the diversions are taken as

1 a given, that would simply reduce the project efficiency
2 a little bit, which is based on those diversions, and
3 those lower efficiencies would then be utilized in the
4 methodology to calculate the reasonable in-season demand
5 adjustments.

6 So, again, it's not valid, I don't think, to
7 say there's just a one-for-one reduction if we were to
8 identify the acres that are irrigated with groundwater
9 based on the methodology equations.

10 Q. (BY MR. THOMPSON) Chuck, just one last part,
11 I guess.

12 Could you look at Part H and describe opinions
13 offered in that section?

14 A. Yes. Part H talks about the baseline year
15 selection. And it is a brief recapitulation of the
16 requirements for selection of the baseline year in the
17 methodology order and a reproduction of Matt Anders'
18 chart that was presented on November 11th, 2022, to the
19 technical working group, where it was indicated that
20 2018 and 2020 were the only years that met all of the
21 evaluation criteria, and those are highlighted in
22 yellow; and then just a brief discussion as to the
23 position, if you will, of 2018 within the overall
24 dataset.

25 And there's different ways to do that. You

1 can look at a ranking analysis. You can look at
2 different probability distribution fits. We chose to
3 fit a normal distribution to the annual diversion volume
4 data, which is a reasonable fit.

5 And, based on that, the 2018 year, which was
6 selected by IDWR in the methodology, was at the 84th
7 percentile. So it was certainly above average, and it
8 was reasonably conservative, but it wasn't an extreme
9 year like the highest year ever or the 95th percentile
10 or 99th percentile.

11 So, again, consistent with the goal of being
12 conservative to protect the senior surface water right
13 holders, we felt that an 84th percentile was, again,
14 reasonably conservative but not extreme.

15 Q. Chuck, in your opinion, I guess, does -- how
16 that is used at the beginning of the year, protecting
17 senior water rights in the event the water year does not
18 turn out as forecast, is that a reasonable approach?

19 A. I think it's reasonable.

20 Q. That's all of the questions I have, Chuck.

21 MR. THOMPSON: I would move to admit
22 Exhibits 4 through 7.

23 And we've tendered Dr. Brockway as an expert
24 on the subjects addressed in the report.

25 COURT REPORTER: I'm sorry. I didn't get

1 that.

2 "And we tender Mr. Brockway" --

3 MR. THOMPSON: Dr. Brockway as an expert on
4 the subjects addressed in the report.

5 HEARING OFFICER: It's my understanding that
6 Mr. Brockway has been recognized as an expert through
7 stipulation of the parties, so he is so recognized.

8 Any objection to the admission of the
9 documents marked Exhibits 4 through 7?

10 Hearing no objection, the documents marked 4,
11 5, 6, and 7 are received into evidence.

12 (Exhibits 4 - 7 received.)

13 HEARING OFFICER: Mr. Simpson?

14 MR. SIMPSON: Mr. Hearing Officer, if I could
15 have a moment with Mr. Thompson?

16 HEARING OFFICER: Sure.

17 MR. FLETCHER: Go off the record just a
18 second.

19 HEARING OFFICER: Let's go off the record.

20 (Discussion held off the record.)

21 HEARING OFFICER: Let's go back on the record.
22 Further questions, Mr. Thompson?

23 MR. THOMPSON: No, thank you.

24 HEARING OFFICER: Any further questions from
25 the Surface Water Coalition?

1 MR. FLETCHER: No, thank you.

2 HEARING OFFICER: Okay. What do we want to do
3 at this point? Do we want to break for 15 and give the
4 parties a chance to regroup and prepare?

5 All right. Let's break and come back at
6 10:30.

7 (Break taken.)

8 HEARING OFFICER: Let's go on the record,
9 Andrea.

10 Mr. Brockway, are you there?

11 THE WITNESS: I am here.

12 HEARING OFFICER: Good. It looks like
13 Mr. Budge has come forward for cross-examination.

14 Mr. Budge, you may examine.

15

16 CROSS-EXAMINATION

17 QUESTIONS BY MR. BUDGE:

18 Q. Good morning, Chuck.

19 How are you?

20 A. Hey, TJ. Doing good.

21 Q. Chuck, how long have you worked for Twin Falls
22 Canal Company?

23 A. Oh, goodness, probably since the '90s.

24 Q. And just generally speaking, what type of work
25 do you do for the company?

1 A. We work as needed, whatever they may need
2 relative to the water rights or water supply evaluations
3 or general advice at board meetings. A little bit of
4 everything.

5 Q. Do you do fieldwork for them as well, analysis
6 out in the field?

7 A. No, haven't really done that, at least
8 recently.

9 Q. Let me have you turn to your expert report,
10 Exhibit 4.

11 A. Yes.

12 Q. And if you'd turn to -- the pages aren't
13 numbered, but I guess the second page or the first page
14 with text, Section A: "Evaluation of TFCC Project
15 Evaluation Acres." I've got some questions about that
16 section.

17 A. Yes, I'm there.

18 Q. In that first paragraph you referred to the
19 acreage used in the Fifth Methodology Order, the
20 194,732-acre figure. And then you say: [As read] "This
21 is based on detailed aerial photo inspection and a
22 delineation created by Twin Falls Canal Company
23 consultants in 2013."

24 Did you participate in creating that
25 shapefile?

1 A. I may have had some input into that, but I
2 believe the primary consultant on that was Dave Shaw.

3 Q. Okay. Are you familiar with that GIS
4 shapefile?

5 A. Yes.

6 Q. Are you sufficiently familiar with it that
7 you're comfortable testifying about it today, or is that
8 something I need to discuss with Dave?

9 A. Well, you know, I haven't looked at every part
10 of it, for sure, but I can certainly take a stab at it.

11 Q. Are you familiar with the parts of that
12 shapefile that are included in your expert report?

13 A. Yes.

14 Q. Okay. Let me have you turn to that page of
15 your report. I think it's page 5.

16 A. Yes.

17 Q. Page 1 of the report says that this was
18 created with a detailed inspection of photo or satellite
19 imagery aerial or satellite imagery.

20 Can you explain the process that was used to
21 create the 2013 shapefile?

22 A. That's a better question for Dave, but I think
23 it just involved examination of the aerial photo and
24 drawing lines on the map, if you will, in the GIS system
25 to represent areas that were irrigated and excluding

1 those that did not appear to be irrigated.

2 Q. Okay. And looking at Exhibit 4, there's an
3 excerpt of a portion of Twin Falls Canal Company's
4 service area. And that image at the bottom, at the
5 footer, says it's showing the difference between the
6 2013 and 2017 area. And I want to make sure that I
7 understand correctly what it depicts.

8 The yellow areas marked in that image, are
9 those areas that the 2017 irrigated lands dataset shows
10 as not being irrigated but the 2013 GIS shapefile shows
11 as being irrigated?

12 A. That is correct.

13 Q. So if we were looking solely at the 2013 GIS
14 shapefile, all of the land in yellow would have, you
15 know, been blue, essentially?

16 A. Yes.

17 Q. In terms of the process to generate the 2013
18 GIS shapefile, your request is that I discuss that with
19 Dave Shaw?

20 A. I think he can shed more light on it than I
21 can, yes.

22 Q. Okay. Do you know if, in 2013, those involved
23 in that, if they excluded, from the irrigated area, what
24 I would call rural farmsteads? They're, like, homes out
25 in the country that you can see some of those, you know,

1 on this image?

2 A. I don't know.

3 Q. Do you know if they compared Twin Falls Canal
4 Company delivery records to see if the water deliveries
5 corroborated the aerial imagery?

6 A. I don't know.

7 Q. Do you know if there was any field
8 verification involved with water users?

9 A. I don't know.

10 Q. Do you know if they took into account
11 groundwater rights within the company's service area?

12 A. I don't know.

13 Q. Do you know if they took time to carve out
14 private roads and subdivision roads, things of that
15 nature?

16 A. It does appear so because they are excluded.

17 Q. There's some roads excluded?

18 A. It does appear so, yes. Again, certainly did
19 not look at every square inch, but it does appear that
20 roadways including major roads and driveways were
21 excluded.

22 Q. Do you utilize GIS mapping frequently as part
23 of your professional work?

24 A. Yes.

25 Q. If you were asked by Twin Falls Canal Company

1 to prepare a precise map that depicted irrigated acres,
2 is that something you could do?

3 A. Yes.

4 Q. Twin Falls Canal Company has not asked you or
5 your firm to do that?

6 A. No.

7 Q. Let me have you turn to page 4 of your report.
8 I understand this is also an excerpt -- an image showing
9 an excerpt of Twin Falls Canal Company service area; is
10 that correct?

11 A. Yes.

12 Q. Did you create Exhibit 4?

13 A. Yes.

14 Q. And I understand the land that's highlighted
15 in blue on Exhibit 4, that's land that is shown as
16 irrigated in the Department's 2017 irrigated lands
17 dataset?

18 A. Correct.

19 Q. And it looks like the irrigated lands dataset
20 carves out things like roads, ditches, farmsteads, and
21 some fields that were not irrigated at that time?

22 A. Correct.

23 Q. Do you know why the 2017 irrigated lands
24 dataset was created?

25 A. Not exactly.

1 Q. Do you know who created it?

2 A. Well, my understanding is it was the
3 Department staff.

4 Q. Do you understand they created that for use in
5 the ESPA model?

6 A. I have heard that testimony, yes.

7 Q. Are you familiar with the ESPA model?

8 A. Yes, somewhat.

9 Q. Do you understand that that dataset is used in
10 the ESPA model?

11 A. That is the testimony I've heard.

12 Q. You don't have personal knowledge of that?

13 A. No.

14 Q. Would you agree that when Department staff is
15 evaluating irrigated acreage, their sole priority is to
16 make sure that the data is as accurate as possible?

17 A. Well, I will give them that benefit of the
18 doubt, TJ.

19 Q. You would agree that Department staff don't
20 have any self-interest in showing more or less acreage
21 than is actually irrigated?

22 A. Not that I'm aware of.

23 Q. If I just make a rough comparison of the 2013
24 GIS shapefile versus the 2017 dataset, would it be fair
25 to say that the 2013 GIS shapefile was created with more

1 of a brush approach, whereas, the 2017 dataset was
2 created with more of a scalpel approach?

3 A. Oh, I'm not sure I would characterize it that
4 way. Again, I haven't been able to examine every bit of
5 both datasets.

6 Q. So I'm just -- Chuck, I'm just looking at the
7 GIS -- the 2013 shapefile, and the only thing that's
8 excluded are what appear to be two public roads. And
9 then if I look at the 2017, it's much more precise.
10 There's a lot of smaller areas and ditches and
11 homesteads that are excluded.

12 Would you agree that the 2017 process was a
13 more precise process?

14 A. Well, I would agree that it does exclude more
15 areas.

16 Q. But your opinion today is that the 2013 GIS
17 shapefile is a more accurate depiction or analysis of
18 irrigated acreage than the 2017 irrigated lands dataset?

19 A. Well, I think it goes back to my direct
20 testimony as just one example. I don't think that
21 ditches and laterals should be excluded, because they
22 are a real consumptive demand that has to be met by the
23 system. So that would be one quibble.

24 Another quibble with the 2017 would be
25 these --

1 Q. Hey, Chuck. Chuck.

2 A. Yes, sir.

3 Q. I'll just interrupt because I understand that.
4 But just on the whole --

5 A. Yeah.

6 Q. -- is it your testimony today, this is your
7 opinion, that the 2013 GIS shapefile is a more accurate
8 representation of irrigated lands in Twin Falls Canal
9 Company than the 2017 irrigated lands dataset?

10 A. I don't have enough information to say that,
11 TJ.

12 Q. Okay. So --

13 A. My testimony is that -- yeah. Go ahead.

14 Q. Okay. So you're not rendering an opinion that
15 the 2013 shapefile is more accurate than the 2017
16 dataset?

17 A. Correct.

18 Q. Do you know why Twin Falls paid its
19 consultants to develop the 2013 GIS shapefile?

20 A. Not exactly.

21 Q. You understand that that analysis was done
22 prior to the 2015 settlement agreement between IGWA and
23 the Surface Water Coalition?

24 A. Yes.

25 Q. You understand at that time, the way IGWA

1 provided mitigation is by renting and delivering storage
2 water to members of the Surface Water Coalition?

3 A. Yes.

4 Q. You understand that if Twin Falls Canal
5 Company could demonstrate a greater number of irrigated
6 acres than had been used previously in the methodology
7 order that the methodology order would calculate higher
8 water demand for Twin Falls Canal Company?

9 A. If the order calculation methodology stayed
10 the same, was not changed by the Department, then, yes.

11 Q. And so you understand that if Twin Falls Canal
12 Company could show higher acreage, the methodology would
13 create larger mitigation obligations, which means IGWA
14 would have to provide larger amounts of storage to
15 Twin Falls Canal Company to avoid curtailment?

16 A. Well, again, this goes back to my direct
17 testimony relative to the equations and the methodology
18 that are employed. The diversions from the river are
19 taken as a given, whatever the acres may be, so --

20 COURT REPORTER: Wait. Mr. Brockway, sorry, I
21 missed something. "The diversions from the river are
22 taken as a given, whatever"?

23 THE WITNESS: Whatever the acres may be.

24 COURT REPORTER: Okay. And then you can
25 continue.

1 THE WITNESS: If the true acres were larger,
2 the same diversions would be used to calculate the
3 project efficiencies. So the project efficiencies would
4 just be a little bit higher. And then those
5 efficiencies would be used in the reasonable in-season
6 demand calculation.

7 Q. (BY MR. BUDGE) So, Chuck, do you agree that
8 it would benefit Twin Falls Canal Company to be able to
9 have a -- have the methodology order use as large of an
10 irrigated acreage figure as possible?

11 A. No, for the reason I just described.

12 Q. Okay. You understand that the 2013 GIS
13 shapefile was developed solely by Twin Falls Canal
14 Company personnel and the company's consultants?

15 A. That's my understanding.

16 COURT REPORTER: "That's my understanding"?

17 THE WITNESS: That's my understanding.

18 Q. (BY MR. BUDGE) Chuck, I apologize there's
19 occasions when we can't -- when there's like a technical
20 glitch, and we don't hear your testimony, so if needed,
21 we'll just ask you to repeat the answer.

22 A. I understand. That's fine.

23 Q. We did catch that one.

24 That process of creating the 2013 shapefile,
25 that was not a collaborative process with the Department

1 of Water Resources?

2 A. I don't know that for sure, but I don't think
3 it was. It may have been.

4 Q. And that was -- there was no collaboration
5 with groundwater users or others outside of the company
6 besides the company's consultants?

7 A. Not that I'm aware of.

8 Q. It was not performed by an independent third
9 party?

10 A. You mean other than Twin Falls Canal Company
11 consultant?

12 Q. Correct.

13 A. Not that I know of.

14 Q. And it was not presented in a hearing where it
15 was subject to scrutiny by the parties to this case?

16 A. I don't know.

17 Q. Okay. Let me have you flip back to page 2 of
18 your report. And you'll see at the bottom of page 2,
19 there's a series of numbered paragraphs where you
20 identify factors that influence the determination of
21 acreage within a large canal company.

22 Do you see that?

23 A. Yes.

24 Q. I want to ask you about some of those.
25 Paragraph 1 discusses ponds and other waterways whether

1 private or company owned.

2 You understand that Twin Falls Canal Company's
3 water rights are for irrigation; correct?

4 A. Correct.

5 Q. And you would agree that the Department should
6 not be curtailing groundwater irrigation rights to
7 deliver -- so that Twin Falls could deliver water to
8 private ponds and waterways?

9 A. Well, let me clarify. What I mean is
10 privately owned irrigation ditches and ponds used for an
11 irrigation system.

12 Q. Okay. So to clarify your report, you're not
13 talking about other types of waterways; you're talking
14 solely about what we would call regulating ponds for
15 irrigation purposes and then irrigation ditches?

16 A. Correct.

17 Q. Let me ask you about No. 2. You refer to
18 fields not being irrigated some years, and then you say:
19 "Fields may have been left idle due to a limited water
20 supply."

21 Were you here when Jay Barlogi testified that
22 he's not aware of any fields that have been dried up due
23 to lack of water?

24 A. Yes.

25 Q. You don't have any personal knowledge as to

1 whether any farmer within Twin Falls Canal Company has
2 dried up a field because they did not have adequate
3 water?

4 A. No.

5 Q. And you understand that fields are sometimes
6 left idle as part of a fallowing program?

7 A. Yes.

8 Q. You understand that fallowing is sometimes
9 used as part of a crop rotation to maintain soil health?

10 A. Yes.

11 Q. And every year there's going to be some number
12 of acres within Twin Falls Canal Company's service area
13 that are idled as part of a fallowing program; right?

14 MR. THOMPSON: Objection; foundation.

15 THE WITNESS: I think that's a fair statement.

16 MR. BUDGE: There was an objection from
17 Travis.

18 HEARING OFFICER: Oh, I didn't --

19 MR. THOMPSON: Sorry.

20 HEARING OFFICER: I heard a voice.

21 MR. BUDGE: I should have just kept going.

22 MR. THOMPSON: I objected to the foundation of
23 the question. I think Mr. Budge was asking about every
24 year that there are acres in a fallowing program, and I
25 didn't see the foundation for that question.

1 HEARING OFFICER: Okay. I'm not sure all of
2 that was audible, but, Andrea?

3 MR. THOMPSON: You can sustain it.

4 (Record read by reporter.)

5 HEARING OFFICER: Overruled.

6 Q. (BY MR. BUDGE) Chuck, let me ask you about
7 paragraph 4. And you're discussing there development of
8 ag land into residential subdivisions. There's been
9 quite a bit of that happen around Twin Falls in the last
10 decade or two; right?

11 A. Yes.

12 Q. You give an example that if you have a 40-acre
13 parcel that's converted to a subdivision, you may end up
14 with, you know, half of that land actually being
15 irrigated?

16 A. Yeah.

17 Q. This is just a hypothetical, I understand?

18 A. It is, yes.

19 Q. And the remaining 20 acres that irrigation is
20 typically going to consist of grass and maybe some, you
21 know, gardens or other landscaping?

22 A. Yes.

23 Q. Is it your testimony that grass consumes twice
24 as much water as other crops grown on Twin Falls' tract,
25 like hay, corn, sugar beets, et cetera?

1 A. No.

2 Q. So you would agree that the amount of crop ET
3 would decrease when a 40-acre tract of farmland is
4 converted into a residential subdivision?

5 A. Yes.

6 Q. I think your testimony was that the timing of
7 irrigation changes because subdivision water use
8 typically happens during a shorter period of time with
9 maybe higher diversion rates?

10 A. Yeah, that is correct. Just the nature of
11 small residential systems. For example, in a typical
12 quarter-acre lot with a sprinkler system, each circuit
13 may be designed for 18 gallons per minute, let's say,
14 which is 2 inches -- 2 miner's inches, or about 3.2
15 shares in Twin Falls Canal Company.

16 I mean, that's about 12 times the amount on
17 strictly a per-acre basis as compared to an agricultural
18 parcel. It's just because small residentials have an
19 extremely high flow rate for short periods of time. So
20 unless there's a strict rotation in force, the actual
21 demand will go up compared to an agricultural scenario.

22 Q. And in that context when you refer to
23 "demand," you're referring to diversion rate?

24 A. Correct.

25 Q. You're not saying that the actual crop water

1 need, or ET, goes up. That actually goes down; right?

2 A. That actually goes down.

3 Q. Okay. Let me have you turn to the next page.
4 In Item 5 you talk about land being fallow because the
5 land is not fully covered by canal shares.

6 Do you understand that Twin Falls Canal
7 Company does allow stockholders to buy and sell shares
8 within the company?

9 A. Yes.

10 Q. So a farmer could sell shares they didn't need
11 or if they needed income or something, but a farmer
12 could sell part or all of their canal shares?

13 A. I believe that's the case, subject to company
14 policies.

15 Q. And if a farmer utilized a fallowing program
16 where, say, you know, one-fourth of its farm was fallow
17 every year, it may not -- that farmer may not need
18 enough shares to irrigate the whole farm every year?

19 A. I'm sorry, TJ. Run that scenario out again.
20 I'm sorry.

21 Q. If a farmer utilizes a fallowing program as
22 part of their crop rotation and leaves 25 percent of
23 their farm fallow each year, that farmer may not desire
24 or need to keep shares sufficient to irrigate the entire
25 farm every year; correct?

1 A. He may not, yeah. Or he may keep his full
2 shares and just use them on the remaining land.

3 Q. Okay. Let me ask you about paragraph 7.

4 You say: "The company's obligation is to be
5 prepared to deliver water under all outstanding shares
6 regardless of the status of the underlying land."

7 You're not testifying that when it comes to
8 making curtailment decisions the Director should assume
9 that parking lots, roads, driveways, and things like
10 that are irrigated? You're not rendering that opinion,
11 are you?

12 A. No, that's not what it says there.

13 Q. In terms of what the company needs to be
14 prepared to deliver water to, they need to deliver water
15 to land that's actually irrigated. Would you agree with
16 that?

17 A. From the company's standpoint, their
18 obligation is to deliver a particular user's shares at
19 his authorized headgate. And what the user does with
20 those shares or how many acres he irrigates with them is
21 not governed by the company or even usually known by the
22 company.

23 Q. So if the company has a tract of land in its
24 service area that was formerly irrigated farmland and
25 now it's a strip mall, should the company divert

1 water -- is it your opinion that the company should plan
2 to divert water from the Snake River for delivery to
3 that strip mall?

4 A. Well, I don't know. That's an extreme
5 scenario. I mean, that would be a question for the
6 company.

7 I mean, if a shareholder had shares and had a
8 headgate, maybe his ditch goes somewhere else, to some
9 other land that's being irrigated. I don't know.

10 Q. Yeah, but I'm talking about shares that are
11 associated with the strip mall. You've put in your
12 report that the company has to be prepared to deliver
13 water to that strip mall.

14 Is it your testimony that the Director should
15 curtail, potentially, junior groundwater users so that
16 the company can deliver water to a strip mall?

17 A. No, I'm not making any opinion as to what
18 should be curtailed or not curtailed.

19 Q. Would you agree that no irrigation occurs on a
20 strip mall?

21 A. Correct.

22 Q. So you would agree, then, when crop water need
23 is calculated, there shouldn't be an ET calculation or a
24 demand calculation for land that's not actually
25 irrigated?

1 A. The ET calculation could take that into
2 account; that's right.

3 Q. Okay. And you would agree that the Department
4 should not assume that acres that aren't capable of
5 being irrigated -- they should not treat those as
6 irrigated acres in the methodology order?

7 A. I think that's reasonable.

8 Q. At the bottom of page 2 -- and I do see a page
9 number at this point -- you've got -- that last
10 paragraph there, there's one sentence.

11 And at the bottom of that, you say: "the
12 acreage used in the Fifth Methodology is reasonable, and
13 there is no clear and convincing evidence at this time
14 to adopt a different figure."

15 A. Yes.

16 Q. You're not a licensed attorney, right, Chuck?

17 A. That's right.

18 Q. And you understand that "clear and convincing
19 evidence" is a legal standard?

20 A. Yes.

21 Q. And you understand you're not qualified to
22 render opinions as to satisfaction of legal standards?

23 A. Yes.

24 MR. BUDGE: Director, based on the witness's
25 testimony, I would move to strike, from his report, the

1 bottom paragraph on page 2 and have it redacted from the
2 record.

3 HEARING OFFICER: I'll deny the motion. I
4 think there's been enough reference in previous
5 material, both submitted by the groundwater users,
6 referring to "clear and convincing evidence" that I'm
7 not going to start striking these references from
8 individual reports.

9 Denied. Go on, Mr. Budge.

10 MR. BUDGE: Okay. And I will just note, for
11 the record, that the groundwater users expert reports do
12 not reference the clear and convincing standard. They
13 do reference what is reasonable.

14 And I appreciate the ruling but did want to
15 make that clear.

16 HEARING OFFICER: Well, certainly reasonable
17 if you want to start -- if you want to start
18 distinguishing between one legal standard and another,
19 as it being appropriate, Mr. Budge, we can go through
20 that. But the ruling is denied.

21 Go on, please.

22 MR. BUDGE: Okay.

23 Q. (BY MR. BUDGE) Chuck, are you familiar with
24 the METRIC ET dataset used by the Department?

25 A. Somewhat.

1 Q. What's your experience with that dataset?

2 A. I personally don't have much experience with
3 it, TJ --

4 Q. Okay.

5 A. -- just as a recognition that it's out there,
6 general knowledge of how it's calculated, but not much
7 direct experience.

8 Q. Thanks, Chuck. I appreciate that.

9 Chuck, were you involved or did you assist
10 Twin Falls Canal Company in resolving their water right
11 claims in the Snake River Basin Adjudication?

12 A. Yes.

13 Q. I understood from Mr. Barlogi's testimony that
14 there was a process where the company and the Department
15 worked together to identify the number of acres that
16 were irrigated for purposes of the adjudication.

17 Were you involved in that process?

18 A. That was a long time ago, but I do remember
19 being involved somewhat.

20 Q. Okay. Do you recall reviewing satellite
21 imagery and working with the Department to determine the
22 number of acres decreed under Twin Falls' water rights?

23 MR. THOMPSON: I'd like to lodge an objection,
24 Director.

25 I guess the line of questioning regarding the

1 pre-partial decree process in the SRBA, I believe, is
2 beyond the scope of this proceeding, isn't relevant.

3 We've had clear court decisions that say
4 conjunctive administration is not a place to
5 readjudicate a water right, so I think anything
6 predecree, going into the process, what was done, is
7 beyond the scope and irrelevant.

8 HEARING OFFICER: Well, thank you for the
9 objection. I'll allow some exploration in this area,
10 recognizing your statement is correct.

11 Mr. Budge, go ahead.

12 Q. (BY MR. BUDGE) Yeah, Chuck, were you involved
13 in preparing the GIS shapefiles that were used in the --
14 as part of the adjudication to define irrigated acres
15 for Twin Falls Canal Company?

16 A. So, again, TJ, that was a long time ago, but
17 my recollection is we had -- we did some work in aerial
18 photo analysis.

19 I think -- my recollection was this may have
20 been pre-GIS days, so it may have been some hand
21 calculations. But, I'm sorry, I don't have a clear
22 recollection of that.

23 Q. That's fine. And I appreciate that.

24 Let me have you turn back to your expert
25 report, and we'll flip to page 14, I believe, involving

1 supplemental groundwater use.

2 A. Yes.

3 Q. I am looking at heading G on page 14 in the
4 first paragraph. And you discuss there that there are
5 groundwater wells used for supplemental purposes within
6 Twin Falls Canal Company's service area, but the
7 percentage of the water supply is generally low due to
8 the overall reliability of the surface water shares.

9 Do you understand, Chuck, that the methodology
10 order does not account for supplemental groundwater use?

11 A. Yes.

12 Q. And you understand that the methodology order
13 assumes that every acre within the company is irrigated
14 solely with surface water?

15 A. I would have to examine the methodology order
16 closely, TJ, but I think that's probably implicit in the
17 analysis, yes.

18 Q. Have you analyzed how many acres within
19 Twin Falls Canal Company have supplemental groundwater
20 rights?

21 A. No.

22 Q. Do you have a rough idea?

23 A. No.

24 Q. Is this something you could do if you were
25 asked?

1 A. We could analyze the areas that are covered by
2 groundwater rights. That would be what could be done
3 without field investigation.

4 Q. And you could do that analysis because the
5 Department has, in its database, groundwater right
6 points of diversion and places of use?

7 A. Correct.

8 Q. And then you would have to work with the canal
9 company to figure out how much of that groundwater
10 irrigated land also receives surface water?

11 A. Yes.

12 Q. It's the --

13 A. I'm sorry. We work with the canal company and
14 the water user.

15 Q. Okay. It would be both; you would have to
16 have the canal company's cooperation so you know where
17 they deliver water, and then you may also want to work
18 with the individual farmers?

19 A. Correct.

20 Q. Without access to Twin Falls Canal Company's
21 water delivery records, there wouldn't really be a very
22 good way of calculating or determining which acres
23 receive supplemental groundwater use?

24 A. I don't understand the question, TJ.

25 Q. So in order to evaluate supplemental

1 groundwater use in a reliable fashion, it would be
2 important to know which parcels of farmland the company
3 delivers surface water to?

4 A. Yes.

5 Q. And that's data that's held by the Twin Falls
6 Canal Company; that's not data that's held by the
7 Department of Water Resources; correct?

8 A. Correct.

9 Q. So that's not data that IGWA or other
10 groundwater users have access to?

11 A. Not that I know of.

12 Q. So you would agree, then, that neither IGWA or
13 the other groundwater users in this case even have
14 access to the data that would be needed to analyze
15 supplemental groundwater use within the company?

16 A. Well, that's a broad --

17 COURT REPORTER: Mr. Brockway, can you start
18 your answer again, I apologize.

19 THE WITNESS: That's a broad question. Some
20 analysis could probably be done given available public
21 data. But, yes, I believe to the extent that actual
22 share locations and delivery locations are needed to
23 make that analysis. I'm not sure that's public
24 information.

25 Q. (BY MR. BUDGE) So it would require Twin Falls

1 Canal Company's cooperation for somebody to do that type
2 of analysis; correct?

3 A. I think to do it right, yes.

4 Q. Okay. So for that to be done right, the canal
5 company holds the cards, essentially?

6 A. I don't know. That's a judgment call.

7 Q. Let me ask you a little bit about the Fifth
8 Methodology Order.

9 I assume you've read that?

10 A. Yes.

11 Q. Have you been familiar with the methodology
12 order prior to your preparation for this case?

13 A. Somewhat.

14 Q. Do you generally understand how the
15 methodology functions as defined in the order?

16 A. I think so.

17 Q. If you'll turn to Exhibit 300 -- and I believe
18 Mr. Thompson emailed that to you today -- that's the
19 Fifth Methodology Order.

20 A. Yeah, I have it.

21 Q. And then, Chuck, if you could flip to page 9
22 and draw your attention to paragraph 19.

23 A. I am there.

24 Q. Do you see in that paragraph where it talks
25 about current conditions needing to be represented by

1 the net area of irrigated crops?

2 A. I see that.

3 Q. You understand that that net area is referring
4 to actual irrigated acreage?

5 A. I'm not sure of the definition of the net
6 area, frankly.

7 Q. Okay. Do you understand that the methodology
8 order uses irrigated acreage to calculate water demand
9 for members of the Surface Water Coalition?

10 A. Yes.

11 Q. And so you would agree that it's important to
12 have --

13 A. Partially.

14 Q. I'm sorry, you would agree that it's important
15 to have accurate irrigated -- accurate irrigated acreage
16 information for use in the methodology by the
17 Department?

18 A. Yes, I would agree that more accuracy is
19 better.

20 Q. Thank you.

21 I believe Exhibit 337 was also emailed to you
22 today. It's a collection of letters from legal counsel
23 for certain members of the Coalition to the Director.

24 A. Yeah, I have that.

25 Q. Are you aware that members of the Surface

1 Water Coalition are required annually to submit their
2 irrigated acreage to the Department for use in Step 1 of
3 the methodology order?

4 A. Yes.

5 Q. Have you seen these letters before?

6 A. No.

7 Q. Does the company ever consult with you about
8 its irrigated acreage in connection with preparing these
9 letters?

10 A. No.

11 Q. So you don't maintain any type of database or
12 analysis of irrigated acreage within the company?

13 A. No.

14 Q. Let me ask you just a couple other questions
15 about the supplemental groundwater usage portion of your
16 expert report. That's Exhibit 4, I'm on page 14,
17 Section G.

18 A. Yes.

19 Q. That paragraph at the top that I quoted
20 earlier states that "the percentage of water supply
21 provided by groundwater is generally low due to the
22 overall reliability of the surface water shares."

23 Can you explain that sentence?

24 A. The Twin Falls Canal Company water supply is
25 generally reliable, obviously, during the shortages.

1 However, there hasn't been the need to develop
2 supplemental groundwater on the Twin Falls tract as
3 there has been, for example, on the North Side tract.

4 COURT REPORTER: On the what tract?

5 THE WITNESS: North Side.

6 COURT REPORTER: Thank you.

7 Q. (BY MR. BUDGE) So, Chuck, you're aware of
8 other surface water delivery entities where there's
9 larger percentages of supplemental groundwater wells?

10 A. Yes.

11 Q. And that typically occurs when the surface
12 water supply is less reliable?

13 A. That's been my observation and experience.

14 Q. Okay. Were you here for the testimony of
15 Jay Barlogi earlier this week?

16 A. Yes. I had to step out for a few moments of
17 it, but I think I heard the bulk of it.

18 Q. During part of his testimony, I was asking him
19 about the types of crops grown within the company's
20 service area, and there were quite a few, including
21 wheat and barley.

22 Do you recall that part of his testimony?

23 A. Yes.

24 Q. And you understand that wheat and barley are
25 typically harvested in, you know, early August?

1 A. Yes.

2 Q. And you would agree that once those crops are
3 harvested, the crop water need within the company would
4 decline?

5 A. Yes.

6 Q. Mr. Barlogi also testified about some of the
7 efficiencies that the company has implemented in recent
8 years.

9 Do you remember that part of his testimony?

10 A. Yes.

11 Q. He mentioned automation and the Kinyon Pond
12 and also some lining projects.

13 Do you recall that?

14 A. I do.

15 Q. One of the projects he mentioned was a large
16 canal lining project that happened in 2019 on the
17 High Line Canal.

18 Is that something you are familiar with?

19 A. No, other than to know that it occurred.

20 Q. Okay. And then he mentioned an upcoming large
21 lining project that's, I think, slated for 2024.

22 Is that something you're involved with?

23 A. No.

24 Q. Okay. You understand when a canal company is
25 lined, that's typically done to minimize or eliminate

1 the amount of seepage out the bottom of the canal?

2 A. Yes.

3 Q. And so if the water is diverted into the
4 canal, that results in a decrease in the total amount of
5 water lost through the bottom of the canal?

6 A. Yes, that's the objectives.

7 Q. And when those lining projects are
8 implemented, the canal efficiency improves; correct?

9 A. Correct. Well, sorry, TJ. Efficiency is
10 calculated lots of different ways. Let's say it this
11 way: The conveyance loss from the canal decreases.

12 Q. That's a better way of saying that. Thank
13 you, Chuck.

14 And I sometimes hear canal companies say that
15 through these types of projects, they're able to stretch
16 their water further. Would that be fair to say?

17 A. Generally that's true.

18 Q. Let me ask a few questions about the increase
19 in sprinkler irrigation efficiency within Twin Falls
20 Canal Company, and I believe you mentioned that it's
21 gone from about 25 percent to 50 to 60 percent.

22 Was that based on Mr. Barlogi's earlier
23 testimony in this case?

24 A. Yes.

25 Q. And you testified that when a shareholder

1 converts from flood irrigation to sprinkler irrigation,
2 less water is applied to the farm field?

3 A. I think that's generally true. The on-farm
4 efficiency can improve.

5 Q. And then the corollary to that is on that
6 particular field, less water is diverted from the canal?

7 A. To that particular field. The same shares may
8 be diverted to other lands, but for that particular
9 field that got converted, generally that on-farm
10 diversion will increase.

11 Q. And also as a result, you have less wastewater
12 runoff under sprinkler irrigation than flood irrigation?

13 A. Generally, yes.

14 Q. And wastewater is typically collected in
15 drains or what's sometimes called waste ditches; is that
16 right?

17 A. Yes.

18 Q. And Mr. Barlogi testified that some of those
19 drains or waste ditches come back into the canal system.

20 Are you aware of that?

21 A. Yes.

22 Q. And others leave the system. They may
23 discharge into a creek or into the canyon or something
24 like that?

25 A. Yes. They may be lost from the system, if you

1 will.

2 Q. And so when a farmer converts from flood to
3 sprinkler irrigation, there's some amount of system loss
4 that is essentially saved to the system.

5 Would you agree with that?

6 A. When a farmer converts -- I'm sorry, say that
7 again.

8 Q. When a farmer converts from flood to sprinkler
9 irrigation, there's some amount of system loss that is
10 saved to the system?

11 A. Well, by system loss, if you mean runoff from
12 his farm.

13 Q. Yeah, that's --

14 A. I assume that's what you mean.

15 Q. That's a better way of saying it.

16 So there's some amount of farm runoff that is
17 conserved or saved?

18 A. Or it decreases, the runoff decreases.

19 Q. And there's also a decrease in the amount of
20 deep percolation or aquifer recharge when somebody
21 converts from flood to sprinkler irrigation?

22 A. Yes.

23 Q. Let me ask a few questions about project
24 efficiency.

25 You testified there's many factors that affect

1 project efficiency, including canal seepage, wetting of
2 banks, operational spills, and sprinkler irrigation.

3 Do you recall that testimony?

4 A. Yes.

5 Q. And you testified that these and other factors
6 should be taken into account when analyzing project
7 efficiency?

8 A. When making a determination on evaluation or a
9 judgment as to the reasonableness of a calculated
10 efficiency. They're all factors that contribute to the
11 need for water diversion that does not directly go to
12 meet the ET of the crop.

13 Q. Okay. And you understand that the methodology
14 order does not take any of these factors into account
15 when it calculates project efficiency for members of the
16 Surface Water Coalition?

17 A. Not directly, that's right.

18 Q. If I understood your testimony right, the
19 methodology order uses an equation that simply divides
20 the diversion volume by crop water need?

21 A. It divides the crop water need by diversion
22 volume.

23 Q. I have that backwards. Thank you for the
24 correction.

25 And so if the conveyance efficiencies of

1 Twin Falls Canal Company improve, the methodology order
2 makes no change in the reasonable in-season calculation?

3 A. That is correct. Yes. That's a true
4 statement.

5 Q. So when Twin Falls Canal Company installed
6 their canal lining project in 2019, the methodology
7 order didn't make any adjustments to account for that
8 improvement?

9 A. Well, not directly, but to the extent that may
10 have showed up as a change in the diversion volume, then
11 the equation that you just spoke of would have picked it
12 up.

13 Q. So if the company had reduced its diversion
14 volume as a result of that improvement, then you would
15 have seen some change in the diversion volume input into
16 the methodology?

17 A. And some change in the efficiency, project
18 efficiency.

19 Q. Okay. And we talked earlier that there's been
20 a pretty substantial increase in the amount of sprinkler
21 irrigated land, from 25 percent to 50 to 60 percent.

22 The methodology order does not do anything to
23 directly account for that added efficiency?

24 A. Not directly.

25 Q. So if I understood your testimony, if

1 Twin Falls Canal Company becomes more efficient in using
2 water, the equation used in the methodology order does
3 not change the reasonable in-season demand?

4 A. Not directly, only if it shows up as a change
5 in the diversion plan.

6 Q. And if irrigated acreage declined in the
7 company, the methodology order would not change the
8 reasonable in-season demand volume?

9 A. It's the same answer. The diversion volume is
10 the baseline -- basis for the methodology calculation of
11 the project efficiency.

12 So it's crop water need, which is a
13 consumptive irrigation requirement, times irrigated area
14 divided by the diversion point. The measure they
15 observed diversion volume.

16 Q. So if Twin Falls' irrigated acreage decreased
17 by one half, as long as they continued to maintain a
18 stable diversion volume, their reasonable in-season
19 demand would not change?

20 A. That's what the equations and the methodology
21 set forth.

22 Q. Let me go back to your expert report. And we
23 can turn to page 7.

24 A. Okay.

25 Q. And I'm looking at Figure 4, which you

1 discussed with Mr. Thompson.

2 And I understood your testimony to be, in your
3 report, that this shows that Twin Falls Canal Company's
4 diversions have remained relatively constant since the
5 late 1970s?

6 A. Yes.

7 Q. And there's a statement in your report that
8 diversions have all been within plus or minus
9 150,000 acre-feet of the average?

10 A. Yes.

11 Q. So do those gray horizontal lines that
12 parallel the average -- there's one above and one
13 below -- does that reflect the plus or minus
14 150,000 acre-feet figure you're talking about?

15 A. Yes.

16 Q. Okay. So I can see there's just a couple
17 orange dots that are kind of outliers that reach that
18 150,000 acre-feet figure?

19 A. Yes. The 150,000 figure, plus or minus --
20 excuse me. Let me back up.

21 The average value plus or minus
22 150,000 acre-feet represents the range of the data.

23 Q. Okay. I understood that correctly, then.

24 And then if we took out those outliers, you
25 know, like 2005 and 2020 and we go back to, say, 2000,

1 it looks to me like diversions have probably been plus
2 or minus maybe 50- or 75,000 acre-feet?

3 A. I would agree. It does appear to be -- it
4 does appear that the variability in the data has been
5 less in recent decades.

6 Q. And at the bottom of that section of your
7 report -- and I'm looking right above the heading number
8 "C" -- or labeled "C" -- you state at the end that:
9 "there's no statistically significant trend in the data
10 set, and if any trend exists, it is a very weak downward
11 trend."

12 You're referring to the time period of
13 46 years shown in that graph?

14 A. Yes.

15 Q. And I believe you testified earlier that if we
16 were to look at a shorter time period, say, from the
17 early 2000s, it would show an upward trend?

18 A. It could if you select the right starting and
19 end date. That's the -- that's one of the bugaboos with
20 trend analysis.

21 Q. Did you run that analysis with a shorter time
22 frame to see what it would show?

23 A. I believe we did do some interdecadal, if you
24 will, analysis to see what that would show, but I don't
25 remember what the results were.

1 COURT REPORTER: A what kind of analysis?

2 THE WITNESS: Oh, let me change that word.

3 Let me say: We did analysis on certain
4 periods within this dataset, but I don't remember what
5 the results were.

6 Q. (BY MR. BUDGE) Just looking, you know, at the
7 graph, isn't it obvious that if we used, like, from 2000
8 to today, so the last two decades, there's an increasing
9 trend?

10 A. I think so. I think the data would probably
11 show that.

12 Q. And during your -- during the discussion we
13 had just a moment ago about project efficiency and crop
14 water need and reasonable in-season demand, reasonable
15 in-season demand is driven largely just by diversions;
16 correct?

17 A. In the methodology order, you mean?

18 Q. Yes.

19 A. Yes.

20 Q. So increasing diversions will show -- will
21 produce increasing demand within the methodology order
22 irrespective of whether crop water need is going up or
23 down or efficiency is going up or down?

24 A. I'm not sure you can make that blanket
25 statement, TJ. But it is -- again, it's -- the

1 methodology assumes that the diversions are what they
2 are, they're a given, and those are used to calculate
3 project efficiency. And those are used, together with
4 the crop water need, to calculate the reasonable
5 in-season demand adjustments. So those factors go into
6 that equation.

7 And then, of course, the baseline year demand
8 doesn't have anything to do with acres, it's just based
9 on diversion.

10 Q. So as diversions go up, the baseline year goes
11 up?

12 A. No. The baseline year is a discretionary
13 selection by the Department.

14 Q. Do you understand the baseline year has to be
15 above the average?

16 A. Yes.

17 Q. So as diversions go up and push the average
18 up, that forces the baseline year to go higher?

19 A. It could if, as happened this year, the
20 average becomes greater than the previously used
21 baseline year, then I assume the Department would
22 reevaluate that.

23 MR. BUDGE: I don't have any further
24 questions.

25 Thanks, Chuck.

1 THE WITNESS: Thanks, TJ.

2 HEARING OFFICER: Further cross-examination by
3 the groundwater users?

4 Mr. Harris?

5 MR. BUDGE: Hey, Director, do you mind if I
6 ask -- there's a document I left on my desk that I
7 forgot to ask Chuck about.

8 HEARING OFFICER: You're asking to displace
9 Mr. Harris?

10 MR. BUDGE: He hasn't taken his seat yet.

11 MR. HARRIS: Come on up.

12 HEARING OFFICER: All right.

13 MR. THOMPSON: TJ, I just had a question about
14 the numbering of that exhibit.

15 I think you had numbered that as a Coalition
16 exhibit. I wonder if you can just renumber it to
17 whatever IGWA's exhibit number is?

18 MR. BUDGE: Yeah, we can do that. And it's
19 not labeled on its face, so when we get to the admission
20 portion of it, we'll do that.

21 Q. (BY MR. BUDGE) Chuck, I had your attorney
22 email to you a couple copies of your expert report.
23 It's pages 4 and 5 that I've added some red highlighting
24 on.

25 Do you have those?

1 A. I see those. Yes, I have those. Yes.

2 Q. Chuck, except for the red highlighting, do you
3 recognize those as Figure 2 and Figure 3 from your
4 expert report?

5 A. Yes.

6 Q. I'll represent that I've added the
7 highlighting. And what I've done is identified areas
8 that do not appear to be irrigated with water from
9 Twin Falls Canal Company.

10 And I'll give you some examples. I'm looking
11 at Figure 2 to begin with; that's the 2017 irrigated
12 lands dataset, and I'll just start in the
13 upper-right-hand corner. That upper-right-hand red box
14 is what I call a farmstead. It's a house and a yard
15 that's out in the country.

16 Do you see that?

17 A. Yes.

18 Q. I assume you are aware that rural farmsteads
19 like this typically have domestic wells?

20 A. Yes.

21 Q. And they're typically using their domestic
22 wells for their culinary use and their, you know, yard
23 and garden and things of that nature?

24 A. They --

25 COURT REPORTER: Mr. Brockway, sorry. You're

1 going to need to start your answer over.

2 THE WITNESS: They are using it for in-house
3 purposes for sure. Sometimes they irrigate their
4 half-an-acre allowance with the domestic well; sometimes
5 they use their surface water shares, in my experience.

6 Q. (BY MR. BUDGE) Okay. If you can just take a
7 moment to look at the areas I've highlighted in red.
8 There was some pivot corners, and then the others are
9 all farmsteads.

10 If you can just confirm that you agree that
11 that's what I've identified?

12 A. Yes, I see them, TJ.

13 Q. Okay. And so these are areas that are not
14 irrigated with the canal water unless the farmstead is
15 using canal water for its landscaping and gardening
16 around the house.

17 Do all the red areas look okay on that, Chuck?

18 A. I'm sorry. What's the question?

19 Q. Okay. And maybe you answered this already,
20 but you've had a chance to review the areas that I
21 marked in red on that?

22 A. Yes.

23 Q. Okay. And you agree that they're representing
24 either pivot corners or rural farmsteads?

25 A. It looks that way, yes.

1 Q. And then I've done the same thing on Figure 3.
2 The one difference for Figure 3 is there's that chunk in
3 the middle where the red is shaped like an E.

4 And on this hard copy version it's kind of
5 hard to see, but as you're aware -- as you're familiar
6 with the original, that highlighted area that looks like
7 an E is actually some subdivision roads. It looks like
8 a newly created subdivision that has roads but no homes
9 yet.

10 Do you recognize that?

11 A. Yes.

12 Q. Other than that subdivision, as I've just
13 described, the other areas, you'd agree, represent rural
14 farmsteads or pivot corners?

15 A. It does appear that way.

16 MR. BUDGE: I would move to have this document
17 marked as the next IGWA Exhibit No. --

18 MS. PATTERSON: 838.

19 MR. BUDGE: -- 838 and admitted into evidence.

20 (Exhibit 838 marked.)

21 HEARING OFFICER: Any objection to the
22 admission of this document?

23 Hearing no objection, the document marked as
24 Exhibit 838 -- is that correct -- is received into
25 evidence.

1 (Exhibit 838 received.)

2 MR. BUDGE: Thank you. And thank you for the
3 accommodation.

4 HEARING OFFICER: Mr. Harris.

5
6 CROSS-EXAMINATION

7 QUESTIONS BY MR. HARRIS:

8 Q. Mr. Brockway, good afternoon.

9 Can you still only hear us? Or can you see us
10 yet?

11 A. I can hear, but not see.

12 Q. Okay. Rob Harris here on behalf of the City
13 of Idaho Falls.

14 Is it okay if I call you "Chuck" today?

15 A. Absolutely.

16 Q. Do you have, close to you or on your computer,
17 Exhibit 300, which is the Fifth Methodology Order?

18 A. Yes.

19 Q. Your report, which is Exhibit 4, and then the
20 expert report of Greg Sullivan with Spronk Water
21 Engineers, that's Exhibit 347A. I'll be referring to
22 those. So I wonder if you could just have those pulled
23 up.

24 MR. THOMPSON: Rob, I think I'll have to email
25 him that.

1 THE WITNESS: Okay. I have those pulled up,
2 Rob.

3 MR. HARRIS: Okay. Great.

4 Q. (BY MR. HARRIS) You are described as one of
5 the three authors of Exhibit 4; correct?

6 A. Correct.

7 Q. Did the three authors prepare different
8 sections, or did you contribute to all of it and are
9 able to testify as to all parts of it?

10 A. The three authors wrote different sections.

11 Q. What sections did you prepare?

12 A. I prepared -- well, let me clarify.

13 Brockway Engineering, myself and Erick Powell,
14 prepared all but Section C; Dave Shaw prepared
15 Section C.

16 Q. Okay. Thank you.

17 How long did it take you to prepare this
18 report?

19 A. Probably three days.

20 Q. Would you have liked to have had more time to
21 prepare it?

22 A. Yes.

23 Q. Okay. The Fifth Methodology Order describes
24 the steps that the Director takes to calculate a
25 material injury number for each member of the Coalition;

1 correct?

2 A. Yes.

3 Q. So it's essentially a formula. Would you
4 agree with that?

5 A. Yes, or perhaps algorithm would be more
6 appropriate.

7 Q. And it is an update to the Fourth Methodology
8 Order that was issued in 2016; correct?

9 A. Correct.

10 Q. And the report is to be based on, "the best
11 available science and underlying water data"; correct?

12 A. I don't know. Are you quoting from the order?

13 Q. I am. So if you look at page 2 of the Fifth
14 Methodology Order, it uses a phrase there: "Apply the
15 best available science and underlying water data."

16 Do you see that?

17 A. I do see that. Thank you.

18 Q. So from a technical standpoint, what does it
19 mean to you to apply the best available science and
20 underlying water data?

21 A. Well, goodness, that's, obviously, a broad
22 question. That's open to interpretation by different
23 people. Some things that occur to me would be that it
24 would be using standard mathematical protocols, standard
25 protocols for analyzing agricultural water use. The

1 underlying data should be available and reasonably
2 accurate. I don't know, Rob, that's a -- that's not one
3 that you can pin down precisely.

4 Q. I think you gave a good answer. And what I'm
5 getting at is you said it had to have some reasonable
6 accuracy; correct?

7 A. I would adopt that, yeah.

8 Q. So it doesn't, necessarily, mean that the data
9 has to be perfect or 100 percent certain, does it?

10 A. No.

11 Q. Okay. I want to turn to page 1 of your
12 report, so it's Section A, "The Evaluation of Twin Falls
13 Canal Company Project Acres."

14 And would you agree with me that irrigated
15 acres identifies land where there is the artificial
16 application of water to grow crops?

17 A. Well, I -- that's a very narrow definition,
18 but in the case of the methodology, it does need to
19 include things like that, in my opinion, waterways that
20 are a real consumptive demand that the system has to
21 meet even though they don't meet your narrow definition.

22 Q. And I'll get to that here in a moment, but
23 just in terms of irrigation, you would agree with me
24 that it's the artificial application of water to land to
25 grow a crop; right?

1 A. Yes.

2 Q. That didn't come through, but I think you said
3 "yes"?

4 A. Yes.

5 Q. And so that would not include roads,
6 sidewalks, parking lots, and other hardened acres?

7 A. Yes, right.

8 Q. And, in fact, if you have the Fifth
9 Methodology Order in front of you, on page 10 --

10 A. Okay.

11 Q. -- paragraph 21, could you read paragraph 21
12 for us. You don't need to read the citations, but go
13 ahead and read that.

14 A. "Estimates of irrigated acres from the hearing
15 show a trend of decreasing irrigated acreage. According
16 to the Hearing Officer, beneficial use cannot occur on
17 acres that have been hardened or otherwise not
18 irrigated."

19 Q. So you would agree that the number of
20 irrigated acres for each Coalition entity feeds into the
21 Fifth Methodology calculation; correct?

22 A. Correct.

23 Q. And so the number of irrigated acres would
24 affect the end result of projecting material injury,
25 would it not?

1 A. Well, this goes back to my previous testimony
2 that the equations in the methodology order assume that
3 the diversion volumes, the observed diversion volumes
4 are -- again, whatever the number of acres are -- the
5 project efficiencies are calculated based on crop water
6 need divided by diversions, and then those project
7 efficiencies go back into the -- those calculated
8 project efficiencies go back into the reasonable
9 in-season demand adjustment equation.

10 Q. So I'll have you look at page 9 of that
11 methodology order and look at paragraph 19.

12 And, Chuck, I understand your argument, and I
13 would categorize your argument as twofold. One is the
14 one you're making where you're saying irrigated acres
15 don't really matter, but there's also a component of
16 your report that indicates that because there are some
17 errors that could happen with generation of a shapefile,
18 that the acreage shouldn't be updated.

19 And I'm asking you about the latter one, which
20 is whether or not acres can be depicted through
21 shapefiles and how that factors into this methodology.

22 So paragraph --

23 A. Oh, I see.

24 Q. So paragraph 19, you would agree with me,
25 says: "A baseline year must be recent enough to

1 represent current irrigation practices. Current
2 conditions should be represented by (a) the net area of
3 the irrigated crops."

4 Do you see that?

5 A. I do.

6 Q. And so is it your position, then, that the
7 Director was in error to look at irrigated acres as he
8 indicated he has in the Fifth Methodology Order?

9 A. No.

10 Q. Okay. So in terms of just calculating
11 irrigated acres, you and your office are familiar with
12 GIS software; correct?

13 A. Yes.

14 Q. You know how to generate and amend shapefiles?

15 A. Yes.

16 Q. You've used them in water transfers and other
17 analyses; correct?

18 A. Correct.

19 Q. In fact, on your website, you indicate that
20 you employ Jennifer Jennings who is, quote, a specialist
21 in GIS mapping and analysis using ArcMap; is that right?

22 A. That is -- that was right up until a few days
23 ago, but she's no longer with the firm.

24 Q. Oh, I'm sorry to bring that up.

25 Okay. But that's something you're personally

1 trained and others in your office on how to do that;
2 right?

3 A. Yes.

4 Q. So as for polygons that are created with GIS,
5 would you agree that they represent the best available
6 technology to calculate the size of areas that are
7 covered by the polygon?

8 A. Yes, I would say so.

9 Q. Pretty accurate in calculating acreage; right?

10 A. If the area photo is rectified properly, it
11 can be quite accurate.

12 Q. And with the update to the Fourth Methodology
13 Order from 2016 to the Fifth in 2023 to have the best
14 available science, that would include an update to the
15 actual irrigated acres; correct?

16 A. It would.

17 Q. And if we look at what qualifies as irrigated
18 acres, would you agree that open water in ditches,
19 ponds, or other waterways are not -- they're not
20 irrigated, are they?

21 A. Under the definition you provided, no.

22 Q. And as I understand your testimony, I think
23 what you're, essentially, saying -- and I'll get to your
24 other arguments in paragraphs 2, 3, 5, and 6 -- but it's
25 that irrigated acres don't matter; what matters is just

1 the diversions.

2 That's the second position in your report;
3 correct?

4 A. Well, we can talk about that when we get
5 there. It's just -- it's not that they don't matter.
6 It's important to understand how they're utilized or not
7 utilized in the methodology equations.

8 Q. I understand.

9 But you're basically -- well, let me -- if I
10 were to say I'm not sure I understand your answer, could
11 you just describe what it is you're arguing, then? If
12 you're saying that it doesn't matter what the irrigated
13 acres are, it's the baseline year, and that's determined
14 by the historic diversions?

15 A. Right. The baseline year demand doesn't have
16 anything to do with acres. It's simply a discretionary
17 selection that fits the criteria outlined in the
18 methodology order.

19 Q. Okay. I appreciate your answer. I'm just
20 going through my questions because I think that answers
21 a fair amount of them.

22 And actually TJ gave a hypothetical, but does
23 that -- that I'll just ask again -- but does that mean
24 that if Twin Falls Canal Company's acres go down
25 100,000 acres, do we keep considering the diversions as

1 a given and compute project efficiency values lower and
2 lower, say, down to 20 percent?

3 A. Well, that is a big hypothetical, obviously.
4 If the acres were to reduce by 50 percent, it probably
5 would show up as a reduced diversion demand, and so
6 then, over time, that would show up as changes in the
7 calculations that are in the methodology order.

8 Q. And I think Travis gave you an example of
9 1 acre, so I gave you 100,000 just to cover the range.

10 But the -- based on at least some
11 calculations, there's been approximately a 15,000-acre
12 change in the system based on the shapefiles; correct?

13 A. Yeah, I've seen those numbers.

14 Q. And overstating the number of actual irrigated
15 acres, from a technical standpoint, would result in a
16 higher determination of material injury; correct?

17 A. Well, again, it's not that clear. It's not a
18 one-for-one calculation like that based on the
19 methodology equations.

20 Q. Okay.

21 A. I could go through that again if you'd like.

22 Q. No, I think I understand your testimony.

23 Thanks.

24 A. Okay.

25 Q. I do want to turn to Part B of your report,

1 which is the trend in the Twin Falls Canal Company
2 diversion.

3 And I think you've taken the position that
4 they've actually decreased over time; correct?

5 A. No. Rob, I don't think I would take that
6 position. It's just if you look at the numerical value
7 of the trend to calculate it, it's very slightly
8 downward but not enough to be statistically significant
9 and not enough to render that opinion.

10 Q. But your analysis of that begins in 1977;
11 correct?

12 A. Correct.

13 Q. Okay. In the Fifth Methodology Order on
14 page 3, the Director states: "To capture current
15 irrigation practices, identification of a baseline year"
16 -- abbreviated "BLY" -- "is limited to years subsequent
17 to 1999."

18 Do you see that?

19 A. I do see that, yes.

20 Q. So the Director began his analysis in 2000.

21 Is it your position that the Director was
22 incorrect to pick a time period after 2000 in his
23 analysis?

24 A. No.

25 Q. Okay.

1 A. No. That's just a discretionary decision.

2 Q. Okay. And, in fact, I'll -- you indicated in
3 your testimony to Mr. Budge that -- kind of just
4 eye-balling recent diversions that it's likely
5 increased.

6 I want to have you look at Greg Sullivan's
7 expert report just a few pages from the very back. It's
8 Table 2-1.

9 A. Uh-huh.

10 Q. And there's a chart in there that -- well, let
11 me know when you get there.

12 HEARING OFFICER: What is the exhibit number?

13 MR. HARRIS: 347A.

14 HEARING OFFICER: Thank you.

15 THE WITNESS: Table 2-1. Okay. I'm there.

16 Q. (BY MR. HARRIS) Great.

17 This is a chart that summarizes the historic
18 diversions of each of the Coalition entities.

19 Do you see the column for Twin Falls Canal
20 Company?

21 A. I do.

22 Q. And do you see that there's some averages
23 below them where you can actually see the average
24 diversions from 2000 to 2014 of 1,045,120 acre-feet?

25 Do you see that?

1 A. Yes. Yes.

2 Q. And then do you see that there's an average of
3 2015 to 2021 of 1,098,477 acre-feet?

4 A. I do see that.

5 Q. So, at least based on those time frames, it
6 appears that there's been an increase of over
7 50,000 acre-feet per year during the 2015-to-2021 time
8 frame; correct?

9 A. I'm just checking to make sure these are
10 adjusted volume. Yes. Yes. So assuming Greg's math is
11 right, which I'm sure it is, then that is correct.

12 Q. Great. And so since the Fourth Methodology
13 Order was issued in 2016 -- now we're in 2023 --
14 certainly since 2016 Twin Falls Canal Company diversions
15 have increased; correct?

16 A. Well, I'd have to do the analysis just for
17 that short period, Rob. I don't know if I can answer
18 that today.

19 Q. Well, it's got a time period of 2015 to 2021.
20 I'm just saying since 2016, based on these data, up to
21 2021, it looks like they've increased.

22 A. So you're asking me if the period 2016 to 2021
23 is greater than --

24 Q. I said -- yeah, greater than 2000 to 2014.

25 A. Well, I'd have to calculate the average of

1 2016 to 2021. That's not shown on Table 2-1.

2 Q. Okay. But at least from 2015 to 2021 it
3 appears it's increased?

4 A. Yes.

5 Q. On -- I'm now going to have you turn to Part D
6 of your report.

7 A. Uh-huh.

8 Q. And so that's on page -- well, I'll have you
9 turn to page 13.

10 You gave a hypothetical there in the middle
11 paragraph. You say: "A simple example calculation
12 demonstrates this."

13 Do you see that?

14 A. I do.

15 Q. So the example assumes 56 percent on-farm
16 efficiency, 20 percent canal loss at the diversion, and
17 operational spill of 15 percent with an overall project
18 efficiency around 42 percent; right?

19 A. Yes.

20 Q. And --

21 A. Well, that's -- the 42 percent is a calculated
22 number based on above assumptions.

23 Q. Right. And you were here -- or I believe you
24 said you were listening in on Mr. Barlogi's testimony
25 that sprinkler irrigation comprises 50 to 60 percent of

1 Twin Falls Canal Company's irrigation practices today?

2 A. Yes.

3 Q. So in your hypothetical, would you expect
4 Twin Falls Canal Company's on-farm efficiency to be
5 65 percent, in that range?

6 A. Oh, I think that may even be a little high,
7 Rob. But that's maybe in the ballpark.

8 Q. But in your hypothetical you arrive at a
9 calculated 42 percent project efficiency; right?

10 A. Right.

11 Q. In the methodology order it projects an
12 efficiency that's 35 percent; correct?

13 A. On average.

14 Q. On average.

15 And so doesn't that mean that the company's
16 collective losses, either conveyance losses or
17 operational spills, must be greater than those in the
18 hypothetical?

19 A. No. Because as I said in the last sentence
20 there, this doesn't account for factors that are very
21 difficult to even put a number on, such as the seasonal
22 shoulder effects and the weather -- the short-term
23 weather changes that reduce the crop water need but
24 don't result in a diversion reduction.

25 So my only point with this paragraph is to say

1 using numbers that we have, that we can reasonably
2 estimate, it's really easy to get to a number like
3 42 percent.

4 So my point here is that it's not at all
5 unreasonable for a large canal company with a thousand
6 miles of ditches and laterals to have an efficiency of
7 something like 35 percent.

8 Q. Did you review the project efficiency of other
9 Coalition members?

10 A. No.

11 Q. Was there a reason you did not look at those
12 numbers?

13 A. Our task was, in the interest of time,
14 primarily to focus on the hot-button company for this
15 matter, which was Twin Falls Canal Company.

16 Q. So you don't know why the other members have
17 been able to operate with much greater project
18 efficiency values? You wouldn't have any knowledge of
19 that?

20 A. I have general knowledge, but I don't have any
21 specifics for you.

22 Q. I have one more area of inquiry, and then I'll
23 be done. And it's Part G under "Supplemental
24 Groundwater Usage."

25 A. Yes.

1 Q. You testified before that you're familiar with
2 GIS shapefiles; correct?

3 A. Yes.

4 Q. And your office utilizes ArcMap, which I'm
5 also familiar with, so you know how to use the clip,
6 merge, buffer, intersect functions that can show areas
7 where groundwater shapefiles overlap with company
8 shapefiles?

9 A. Yes.

10 Q. And you could perform a function that would
11 yield a shape that would show where that overlap occurs;
12 right?

13 A. Yes.

14 Q. And the same thing with points of diversion?

15 A. Well, clarify that, if you would.

16 Points of diversion for wells would be the
17 individual private wells.

18 Q. Correct.

19 A. Whereas --

20 Q. Yeah. And you could at least get an initial
21 list of the privately decreed groundwater rights that
22 exist within Twin Falls Canal Company's service area?

23 A. Yes.

24 Q. Okay. And those shapefiles have attribute
25 data associated with them; correct?

1 A. Yes.

2 Q. It would have things like legal descriptions
3 or IDWR metal tag numbers or even WMIS diversion numbers
4 in it; correct?

5 A. Yes.

6 Q. And in terms of knowing who owns the
7 properties where these shapes are, have you utilized tax
8 parcel data that's generated by the counties to show
9 land ownership?

10 A. Yes.

11 Q. And that's fairly readily available these
12 days; right?

13 A. It is.

14 Q. And so wouldn't that be a starting point of
15 where groundwater may be used within the company?

16 A. Yes.

17 Q. Are you familiar with the -- well, you are
18 familiar with the WMIS database maintained by the
19 Department; correct?

20 A. Yes.

21 Q. And that's an acronym for Water Management
22 Information System?

23 A. Yes.

24 Q. And that system tracks groundwater diversions
25 either measured by flowmeters or calculated through PCC

1 calculations; correct?

2 A. Yes.

3 Q. Okay. And, in fact, I believe you've used
4 those in transfers and other situations, have you not?

5 A. Yes.

6 Q. And so do you consider them to be a reliable
7 source of information, albeit maybe not perfect, for
8 historical groundwater diversions?

9 A. Yes.

10 Q. I believe you said "yes"?

11 A. Not perfect. Yeah, I would agree with you,
12 Rob. Not perfect, but reasonably reliable in most
13 cases.

14 Q. And best available; right?

15 A. I think so.

16 Q. Okay. And I think the point of the Director's
17 order is that supplemental groundwater use may be looked
18 at because it may contribute to the overall water
19 supply.

20 Do you agree with that?

21 A. Sorry. Could you restate that?

22 Q. Yeah. I believe that the Director's order --
23 the reason supplemental groundwater use is even
24 mentioned is that it could be considered a source of
25 water supply to irrigate acres within the Twin Falls

1 Canal Company's service area; correct?

2 A. So my apologies. I'm not familiar with where
3 that's mentioned in the order. I would have to go
4 reread that again.

5 Q. I'll refer you to page 10 at the bottom,
6 paragraph 23.

7 Do you have that in front of you?

8 A. Okay. I'm there.

9 Q. It says: "There are lands within the service
10 area of SWC entities that are irrigated with
11 supplemental groundwater."

12 Do you see that?

13 A. I do see that.

14 Q. And that's under the section of the order
15 under "Irrigation Practices," which is also under the
16 available water supply to those that irrigate within the
17 service area.

18 Do you see that?

19 A. I do see that.

20 Q. So as I understand the order, the analysis of
21 supplemental groundwater is that it would provide
22 another source of supply as to what could be irrigated
23 acres within the company; right?

24 A. Right.

25 Q. Okay. And wouldn't WMIS data that's matched

1 to places of use points of diversion groundwater rights
2 be a reliable starting point to determine how much
3 supplemental groundwater is used?

4 A. It would be a starting point.

5 Q. And may be subject to some ground truthing as
6 you said before; right?

7 A. Right.

8 Q. All right. I just have one more question.
9 The last one is on the baseline year discussion.

10 Isn't it true that so long as Twin Falls Canal
11 Company continues to increase its diversions, then the
12 average will increase, and then in a few more years,
13 there would be a higher baseline year with higher
14 demand? Isn't that the end result of just looking at
15 diversions?

16 A. If Twin Falls Canal Company diversions
17 continue to increase, under that hypothetical, then,
18 mathematically, their average will also continue to
19 increase. What the Department does with that in the
20 future is not something I can say.

21 Q. But if they continue to base mitigation
22 obligations on that calculation, wouldn't that require
23 the groundwater users to provide more upfront water?

24 A. Well, if -- under your assumption that a new
25 baseline year is selected?

1 Q. Yes.

2 A. It could, yes.

3 MR. HARRIS: Director, I believe that's all of
4 the questions I have.

5 Thank you.

6 HEARING OFFICER: Thank you, Mr. Harris.

7 THE WITNESS: Thank you, Rob.

8 HEARING OFFICER: I assume there is more
9 cross-examination?

10 MR. BRICKER: Yeah.

11 HEARING OFFICER: Okay. Well, let's break for
12 lunch. Come back at a quarter after 1:00. Thank you.

13 (Lunch break taken.)

14 HEARING OFFICER: Okay. Let's go back on the
15 record. Next to examine.

16 Are we on, Andrea?

17 COURT REPORTER: Yes.

18 HEARING OFFICER: All right. Thank you.

19 Mr. Anderson, you may examine.

20 MR. ANDERSON: Thank you.

21

22 CROSS-EXAMINATION

23 QUESTIONS BY MR. ANDERSON:

24 Q. How are you, Mr. Brockway?

25 A. I'm doing fine, thank you.

1 Q. Good. I'm Dylan Anderson. I've seen you
2 before. I don't know if we've actually met in person or
3 not, but I just have a quick question for you.

4 As you explained with irrigated acres, as they
5 would go down, the efficiency would go down, or as they
6 would go up, the efficiency would go up, so they don't
7 really affect the reasonable in-season demand. Is that
8 an accurate representation as you've explained it?

9 A. They don't affect it on a direct proportionate
10 basis; that's right.

11 Q. So if the Department wanted the actual
12 irrigated acres to be reflected in the reasonable
13 in-season demand, would they, then, need to somehow fix
14 efficiency? "Fix," I mean make it static or control for
15 that number?

16 A. That could be a way to do it.

17 MR. ANDERSON: That's it. That's the only
18 questions I have.

19 Thanks.

20 HEARING OFFICER: Okay. Next?

21 Mr. Bricker, come forward.

22 MR. BRICKER: Before I begin the examination,
23 Director, I believe the parties, we've all stipulated to
24 admitting Exhibit 316 into evidence, and I just wanted
25 to make that clear now.

1 HEARING OFFICER: 316?

2 MR. BRICKER: Yeah.

3 MR. FLETCHER: Which is the same as 914;
4 right?

5 MR. BRICKER: Also 914, the same document.

6 HEARING OFFICER: Okay. There's a stipulation
7 to the admission of 316 and what? Corresponding 914?

8 MR. BRICKER: Correct.

9 MR. FLETCHER: It's the same exhibit.

10 MR. BROMLEY: They just need 316.

11 MR. FLETCHER: Mr. Director, are we on the
12 record?

13 HEARING OFFICER: We are.

14 MR. FLETCHER: Can we go off for just a
15 second?

16 (Discussion held off the record.)

17 HEARING OFFICER: Back on the record.

18 So the parties have stipulated to the
19 admission of Exhibit 914, which also corresponds to what
20 was marked as 316. Thank you. It's received into
21 evidence, Exhibit 914.

22 (Exhibit 914 received.)

23 MR. BRICKER: Good to go?

24 HEARING OFFICER: Yes.

25 ///

1 CROSS-EXAMINATION

2 QUESTIONS BY MR. BRICKER:

3 Q. Good afternoon, Mr. Brockway.

4 A. Good afternoon.

5 Q. My name is Max Bricker. I represent the City
6 of Pocatello. I have a few questions for you here.7 So in your report, you state that: "The
8 diversion volume in the Fifth Methodology baseline year
9 of 2018 is at the 84 percentile and provides a
10 reasonable factor of safety to protect senior water
11 right holders."

12 Is that right?

13 A. I am getting there. One second. Are you
14 looking at the conclusions?

15 Yes. Okay, I see that. Uh-huh.

16 Q. And you also state that: "Using 2018 as the
17 BLY provides a reasonable factor of safety without being
18 extreme."

19 Right?

20 A. Yes.

21 Q. Isn't it possible that diversions from a
22 baseline year at a percentile lower than the 84th could
23 still provide a reasonable factor of safety?24 A. Well, obviously, the word "reasonable" was up
25 to interpretation. So in general, yes.

1 Q. Thanks.

2 Isn't there already an additional safety
3 factor by using the forecast supply minus one standard
4 deviation?

5 A. Yes.

6 Q. If the safety factor is too high, then won't
7 the forecast shortage almost always be greater than the
8 actual shortage determined at the November 1st
9 reconciliation?

10 A. The conservatism built into the system or into
11 the algorithm could be set such that that would be the
12 case.

13 Q. And similarly, if the groundwater users have
14 to provide mitigation water based on an overly
15 conservative forecast shortage, won't they almost always
16 end up overmitigating?

17 A. That is the same answer to my previous
18 question.

19 Q. Thanks. Doesn't that suggest that there is a
20 point at which too much conservatism in the forecast
21 ends up being a waste of the resource?

22 A. That's a policy question not a technical
23 question, so I don't have an opinion on that.

24 Q. Okay. Also in your report you state that:
25 "Operational spill is always necessary in order to

1 deliver water to users within the systems. Spill must
2 be maintained in order to account for variations in
3 demands by irrigators. Without spill it would be
4 impossible to reliably serve the tail ends of the
5 system."

6 Correct?

7 A. That's true.

8 Q. Even if operational spills were necessary, the
9 amount can be reduced with more prudent management;
10 correct?

11 A. Possibly.

12 Q. And isn't there a point when operational
13 spills become excessive?

14 A. Again, there's no bright line there. I think
15 there would be, but there's no set point or a bright
16 line.

17 Q. Fair enough.

18 Okay. Also in your report, you state that:
19 "It is not unreasonable to see flat or declining project
20 efficiencies even though sprinkler conversions are
21 continuing to occur."

22 Is that right?

23 A. Yes.

24 Q. So if on-farm efficiencies increase as
25 sprinkler conversions continue and conveyance losses

1 stay constant but project efficiencies stay flat, that
2 must mean that operational spill rates have increased;
3 right?

4 A. Well, that's one possibility, but there could
5 be other operational factors that might enter into that,
6 as I've indicated.

7 Q. You also state that: "It has been
8 demonstrated herein that the project efficiency is
9 reasonable."

10 Right?

11 A. Yes.

12 Q. How are you defining the term "reasonable"?

13 A. Well, the hypothetical calculation that
14 Mr. Harris and I went through, I think, is a good
15 foundation for that. There are just certain levels of
16 system losses, if you will, that can be reasonably
17 achieved. There's no set definition for reasonable, but
18 there are, certainly -- I think the term has been
19 used -- "industry standards" that can be used to define
20 whether waste is going on. So my only point of that
21 calculation was just to demonstrate how very easy it is
22 for a large, slow-moving canal system to have
23 efficiencies that are very low.

24 Q. And you agree that project efficiencies can
25 change; right?

1 A. Yes.

2 Q. And you also agree that a project whose
3 operations are reasonable at one point in time could at
4 some point in the future cease to be reasonable?

5 A. No. That's -- I don't know about that.

6 Q. So as an example, just because something was
7 reasonable in the year 1910 doesn't, necessarily, mean
8 it's reasonable today; right?

9 A. Well, I believe the definition of reasonable
10 is to compare it with current industry standards or
11 current state of the art. I think I would generally
12 agree with that.

13 Q. So if the technology changes, that could
14 render an outdated operation no longer reasonable;
15 right?

16 A. Possibly.

17 Q. Isn't it true that Twin Falls Canal Company's
18 baseline year demands are equal to its 2018 diversions
19 in the Fifth Methodology Order?

20 A. What are you asking me, if the Department
21 chose 2018 as the baseline year?

22 Q. Yes.

23 A. That's true.

24 Q. And its diversions in that year are the
25 baseline demand?

1 A. Correct.

2 Q. Isn't it also true that Twin Falls Canal
3 Company claims to divert roughly 1,100,000 acre-feet
4 annually?

5 A. I think that's the round number that is often
6 cited or stated.

7 Q. Okay. So hypothetically here, when
8 multiplying 1,100,000 acre-feet by an average project
9 efficiency of .35, that equals an annual crop water need
10 of roughly 385,000 acre-feet; right?

11 A. Yes.

12 Q. Now, in your example in your report, you
13 arrived at a project efficiency of .42; right?

14 A. For that purely hypothetical example.

15 Q. Sure. So in my hypothetical, if you were to
16 divide that calculated crop water need of
17 385,000 acre-feet by a project efficiency of .42,
18 doesn't that equal 917,000 acre-feet, roughly?

19 A. Yes.

20 Q. So if that crop water need were to stay
21 consistent and the canal company in this hypothetical
22 were to achieve a project efficiency of .42, its
23 diversions could decrease by a magnitude of roughly
24 200,000 acre-feet; right?

25 A. Yes.

1 Q. Doesn't that indicate that a change -- a minor
2 change in project efficiencies -- we'll call it a few
3 decimal places -- can make a significant difference in
4 demand by a magnitude of tens of thousands of acre-feet?

5 A. Yes.

6 MR. BRICKER: That's all of the questions I
7 have. Thank you.

8 HEARING OFFICER: Other questions from the
9 groundwater group?

10 I don't see anybody.

11 Redirect, Mr. Thompson?

12 MR. THOMPSON: Good afternoon, Chuck. This is
13 Travis Thompson back here for a few redirect questions.

14 THE WITNESS: Hey, Travis. I can see you this
15 time, so that's good.

16 MR. THOMPSON: Good for you or me? I don't
17 know.

18 THE WITNESS: Well, I don't know.

19
20 REDIRECT EXAMINATION

21 QUESTIONS BY MR. THOMPSON:

22 Q. Can you -- you had a long discussion with
23 Mr. Budge about irrigated acreage in the context of
24 reasonable in-season demand and how that's calculated in
25 the methodology.

1 Do you recall that?

2 A. I do.

3 Q. Can you provide a summary of your
4 understanding?

5 A. Yes. Let me try to tidy this up because it's
6 sort of been, I think, saved in a fractured manner. So
7 let me try to summarize.

8 As a general principle for irrigation systems,
9 of course the number of irrigated acres matters. You
10 know, a diversion requirement is generally a requirement
11 of irrigated acres. I don't think that's in dispute.

12 So my testimony is not that irrigated acres
13 don't matter. But just looking at the mathematics
14 outlined in the methodology that are required to make
15 the reasonable in-season demand calculation right now
16 for this year, the observed diversions are a given, and
17 the historic project efficiencies are calculated as the
18 consumptive irrigation requirement times the irrigated
19 area divided by the observed diversions. Then the
20 project efficiencies are used to calculate the
21 reasonable in-season demand adjustments for this year.
22 And, of course, the baseline year is not a function of
23 acres at all.

24 So if the acreage s in the methodology are
25 wrong, if you somehow knew that, then you would have to

1 go back and recalculate the historical project
2 efficiencies, otherwise they would also be wrong. Then
3 those different efficiencies will be used to calculate
4 the reasonable in-season demand for this year.

5 Theoretically, the reasonable in-season demand
6 calculated in that way might not change. Again, just
7 talking about the specific calculation for this year.

8 Now, that may not exactly be true because
9 things are confounded somewhat by the fact that the
10 Department actually used different acres, historically,
11 for some period in the past. And I have not delved into
12 the guts of the reasonable in-season demand calculation
13 spreadsheet to know exactly what it's doing. I'm just
14 observing the mathematics in the methodology.

15 If the -- if a different acreage were used, it
16 would not result in a direct proportional reduction in
17 the reasonable in-season demand calculation for this
18 year, as has been claimed.

19 So that's kind of a -- as tidy as I can make
20 it a summary of how the acres play into or don't play
21 into the calculation of the reasonable in-season demand.

22 MR. FLETCHER: Somebody needs to mute. They
23 did.

24 Q. (BY MR. THOMPSON) Okay. Chuck, we're still
25 here. Just had somebody, I think, that was off mute.

1 A. Okay.

2 Q. Did you hear the testimony of Jay Barlogi,
3 that the Twin Falls Canal Company has over 100 miles of
4 main canals and roughly 1,000 miles of laterals?

5 A. I did.

6 Q. And do you know the length of the lining
7 project completed on the High Line in 2019 that
8 Mr. Budge was discussing with you?

9 A. I don't know the exact length.

10 Q. I guess, would that be an important factor to
11 consider to determine the impact on overall canal
12 seepage?

13 A. Yes.

14 Q. And you've looked at the diversion data for
15 large open canal systems in southern Idaho; is that
16 correct?

17 A. In general, yes.

18 Q. Is 5 to 6 acre-feet per acre a reasonable
19 diversion rate, in your opinion?

20 A. Yes.

21 Q. Getting back to these -- we talked about the
22 regression analysis on trends and diversions for
23 Twin Falls Canal Company.

24 Do you recall that discussion?

25 A. Yes.

1 Q. I think Mr. Harris pointed out to you the
2 Fifth Methodology Order looking at a period of 1999 to
3 2021.

4 A. Right.

5 Q. And do you recall if 2001 to 2005 were
6 multiple years of drought?

7 A. Yes.

8 Q. Would those be considered years of limited
9 supply?

10 A. I'm not sure if they all were, but, in
11 general, yes.

12 Q. And I think Mr. Budge talked about a trend of
13 -- 2015 to 2021 showing an increasing trend in
14 diversion; is that correct?

15 A. I believe so.

16 Q. I guess by that same analysis, would -- what
17 would 2020 through 2022 show?

18 A. Well, it's only three years, but they will be
19 decreasing.

20 Q. So it certainly depends on the number of years
21 and what you're looking at for a trend analysis; isn't
22 that correct?

23 A. It does. That's correct.

24 Q. Mr. Budge asked you some questions about
25 Exhibit 838.

1 Do you recall those?

2 A. Yes.

3 Q. And I think that was an exhibit that he had
4 overlaid some red-shaded areas in.

5 Do you recall that?

6 A. I do.

7 Q. Would you agree that the interpretation of
8 what is actually irrigated can vary depending upon the
9 individual involved?

10 A. Yes, very much so.

11 Q. So an attorney's interpretation, like
12 Mr. Budge's, could vary from an engineer's. Would you
13 agree with that?

14 A. Yes, I agree with that.

15 Q. And the particular year could change what
16 actually happens on the ground; is that correct?

17 A. Yes.

18 Q. So a corner left out of irrigation in 2021
19 could actually be irrigated in 2023?

20 A. Yes, that's right.

21 Q. Finally, just a question Mr. Harris asked you
22 about desiring to have more time to prepare your report
23 in this case.

24 Do you recall that?

25 A. Yes.

1 Q. Do you work within the deadlines set for
2 contested cases and adapt to what is required?

3 A. Oh, yes.

4 Q. Is that what you did here?

5 A. That's what I did here.

6 MR. THOMPSON: That's all of the questions I
7 have.

8 Thank you, Chuck.

9 THE WITNESS: Thank you.

10 HEARING OFFICER: Recross, Mr. Budge?

11 Mr. Harris?

12 MR. HARRIS: I actually have just a couple.

13
14 RE-CROSS-EXAMINATION

15 QUESTIONS BY MR. HARRIS:

16 Q. Chuck, Rob Harris again.

17 Just to follow up, more of a foundational
18 question to Mr. Thompson's question.

19 You said that you looked at the diversion data
20 of large canals in southern Idaho.

21 What -- specifically, what canals were you
22 looking at?

23 A. Well, let me clarify, Rob. Not for this case.
24 My testimony is that I'm generally familiar with
25 diversion data and volumes for large canal systems.

1 Q. Okay. And I guess, again, just a foundational
2 question is: How are you familiar with those? Or what
3 canals did you look at?

4 A. Just in the course of my general work. So it
5 would be companies such as North Side -- excuse me --
6 Aberdeen-Springfield and some of the other eastern Idaho
7 canal systems.

8 Q. And North Side Canal Company is an on-demand
9 system like Twin Falls Canal Company is; correct?

10 A. I believe so, yeah.

11 Q. And the tailwater from that system comes in
12 below the Milner Dam into the Snake River Canyon?

13 A. Yes.

14 Q. Mr. Thompson asked you some questions about
15 Exhibit 838 about those red-shaded areas and about
16 individual interpretation, that it can be different.

17 Do you recall that testimony?

18 A. Yes.

19 Q. Would you say it's often different or -- based
20 on the photos, you can typically see green vegetation
21 growing to indicate it's growing; right?

22 A. You can. And then there are those areas that
23 are not green and are subject to interpretation.

24 Q. But wasn't that the same process that was used
25 in the Snake River Basin Adjudication to determine

1 irrigated acres, in your experience?

2 A. I think generally, yeah. I mean, they started
3 as a -- from a -- as a first cut, if you will, looking
4 at land that was green or showed an infrared signature
5 and then applied some human brain power to look at some
6 areas that may not have been so clear.

7 MR. HARRIS: That's all of the questions I
8 have. Thank you.

9 HEARING OFFICER: Mr. Anderson --

10 THE WITNESS: Thank you.

11 HEARING OFFICER: Mr. Anderson, further
12 questions?

13 MR. ANDERSON: No, Director. Thank you.

14 HEARING OFFICER: Mr. Bricker, further
15 questions?

16 MR. BRICKER: Nope.

17 HEARING OFFICER: Any other recross?

18 All right. Thank you, Mr. Brockway, for
19 participating today.

20 THE WITNESS: Thank you, Director. I
21 appreciate you for accommodating my situation here.

22 HEARING OFFICER: Yep.

23 Next witness.

24 MR. THOMPSON: The Surface Water Coalition
25 will call Dave Shaw.

1 HEARING OFFICER: Mr. Shaw, if you'll come
2 forward, please.

3
4 DAVID B. SHAW, P.E.,
5 called by the Surface Water Coalition, having been first
6 duly sworn to tell the truth relating to said cause,
7 testified as follows:

8
9 HEARING OFFICER: Thank you. Please be
10 seated.

11 Mr. Thompson?

12 MR. THOMPSON: Thank you, Director.

13
14 DIRECT EXAMINATION

15 QUESTIONS BY MR. THOMPSON:

16 Q. Dave, could you please state and spell your
17 name for the record.

18 A. David, D-a-v-i-d, middle initial "B" as in
19 "boy," Shaw, S-h-a-w.

20 Q. And where do you currently work?

21 A. I work for ERO Resources Corporation.

22 Q. And what is your occupation?

23 A. I'm an engineer.

24 Q. Is your CV attached to what's been labeled as
25 Exhibit 4 in this case?

1 A. Yes, it was.

2 Q. Does that generally describe your education
3 and work history?

4 A. It hits the high spot, yes.

5 Q. Have you been qualified as an expert witness
6 before IDWR in prior cases?

7 A. Yes.

8 Q. Can you generally describe what you were asked
9 to do for the report identified as Exhibit 4?

10 MR. HARRIS: Director, real quick.

11 Dave, could you pull the microphone a little
12 closer just so we can hear a little better.

13 Thank you.

14 THE WITNESS: I was asked to look at the
15 methodology order and the As-Applied Order and evaluate
16 its implementation.

17 Q. (BY MR. THOMPSON) And if you could turn to
18 that Exhibit 4, page 7. It should be behind you.

19 A. Okay.

20 Q. Does that Part C of pages 7 through 11
21 generally reflect your work product in this report?

22 A. Yes, it is.

23 Q. And can you describe those opinions that
24 you've offered there?

25 A. This was as a result of looking at

1 efficiencies. Mr. Sullivan and others were looking at
2 the efficiencies and trying to do a trend analysis for
3 changes in efficiencies over time. I thought it would
4 be important to look at how the efficiencies were
5 calculated, and that's primarily where I focused my
6 effort.

7 Efficiency, I think everyone has talked about
8 it before, it's crop water need times acres divided by
9 diversion. Acres has been discussed here a lot. Crop
10 water need, not so much. We know AgriMet is used for
11 the ET values. Mr. Sullivan called them a CIR,
12 consumptive irrigation requirement. But there wasn't --
13 hasn't been such discussion about crop mix. And that's
14 also an important element in determining water use
15 efficiency and crop water need.

16 Q. And is that crop data layer, is that CDL data
17 that the Department uses?

18 A. The Department's used that since 2007. Prior
19 to 2007, that data was not available. The information
20 was reported on a countywide average. My recollection
21 is the Department averaged the crop mix for the county
22 or counties in which a delivery organization was
23 located, and then from that, created some kind of an
24 average that they used for the water delivery
25 organization.

1 Q. And do you have some recommendations on the
2 use of that data in the methodology going forward?

3 A. I do.

4 Q. And could you describe those?

5 A. My understanding of the current methodology
6 and the technical work group was provided with a copy of
7 what IDWR calls their calculator worksheet during the
8 TWG meetings during last fall and winter.

9 My understanding is for the period 2000
10 through 2014, the crop mix for all of those years has
11 been averaged together. So any trends, changes over
12 time, have been lost. So the crop water need is
13 calculated by the ET or CIR for a particular year
14 against an average of the crops that have been raised
15 over that 2000-to-2014 period.

16 Starting in 2015, IDWR took the prior three
17 years -- so '12, '13, and '14 -- averaged that crop mix
18 or those crop mixes and then used that average to
19 calculate crop water need for 2015, and that's continued
20 through last year.

21 Q. And does that data become available like as
22 the actual data at the end of the year?

23 A. I understand it's available after the first of
24 the year, so 2023 data will be available January 2024.

25 Q. And is there a question whether they'd go back

1 and insert the actual data into that number?

2 A. To have a true estimate of system efficiency,
3 yes, they need to use the crop mix for the year they're
4 using the diversion data from.

5 Q. Can you generally describe Figure 6 on
6 page 11, what that depicts?

7 A. This is an estimate of alfalfa and corn from
8 the CDL data for Twin Falls Canal Company for the period
9 2007 through 2022.

10 And then there's a third line that are the
11 diversions for Twin Falls Canal Company adjusted for
12 recharge.

13 And it shows the trends of increasing both
14 alfalfa and corn, and there's a slight increase in
15 diversion. I did not test it to see if it was
16 significant or not.

17 Q. Those graphs confirm what you heard from
18 Twin Falls Canal Company's manager Jay Barlogi earlier
19 this week?

20 A. He has said there have been recent increases
21 in alfalfa and corn, yes.

22 Q. And does that sort of crop mix, increases in
23 those type of crops, impact water demand within the
24 project?

25 A. It does. Alfalfa, Twin Falls AgriMet on

1 average is a little over 40 inches per year. Small
2 grains -- wheat, oats, barley -- is low, 20 inches per
3 year. So not quite 100 percent increase, but pretty
4 significant increase going from small grains, for
5 example, to alfalfa. Corn is in the upper 20s, lower
6 30, so even going from small grain to corn is roughly a
7 50 percent increase.

8 Q. And do you have any comments on, I guess,
9 challenges with project efficiency in large, open canal
10 systems?

11 A. I've heard there are challenges, yes.

12 Q. Do you have familiarity and experience with
13 large, open canal systems in Idaho?

14 A. I do.

15 Q. And do you have any opinions on how the
16 Twin Falls Canal Company operates and maintains its
17 system?

18 A. Compared to other water delivery organizations
19 I've seen in Idaho, I think they're well-managed. They
20 do a good job with maintenance. I think their delivery
21 system and their plan for delivery is reasonable.

22 MR. THOMPSON: I don't have any other
23 questions. We'd just tender Mr. Shaw as an expert in
24 the fields that he testified to in his report.

25 HEARING OFFICER: Excuse me. You want

1 Mr. Shaw recognized?

2 MR. THOMPSON: As an expert for the subjects
3 that he's testified to in his report.

4 HEARING OFFICER: And I believe the parties
5 have stipulated to recognize Mr. Shaw as an expert, so
6 he is so recognized.

7 No further questions, Mr. Thompson?

8 MR. THOMPSON: No, thank you.

9 HEARING OFFICER: Cross-examination?

10 Mr. Budge?

11

12 CROSS-EXAMINATION

13 QUESTIONS BY MR. BUDGE:

14 Q. Good afternoon, Dave. How are you?

15 A. Good, TJ. How are you?

16 Q. Very good. Thank you.

17 A. Besides wanting to go home.

18 Q. Yeah, I'm looking forward to that.

19 MR. FLETCHER: It's all up to you, TJ.

20 MR. BUDGE: It's only going to take me ten
21 minutes, Kent.

22 MR. FLETCHER: Oh, gosh, the TJ multiplier
23 coming on.

24 Q. (BY MR. BUDGE) Dave, if would please turn to
25 page 2 of your report for the heading "Evaluation of

1 TFCC Project Acres."

2 A. What page was that?

3 Q. It's just on the second page. It's heading A.
4 Are you looking at Exhibit 4?

5 A. I am.

6 Q. And this is part of the expert report that you
7 submitted?

8 A. Yes.

9 Q. And do you see at the top of page 2 a
10 heading A?

11 A. Yes.

12 Q. Titled "Evaluation of TFCC Project Acres"?

13 A. Oh, okay. Yes.

14 Q. You were here when I discussed this with
15 Mr. Brockway earlier today?

16 A. Yes.

17 Q. You recall I was asking him about the process
18 used to create the 2013 GIS shapefile of Twin Falls
19 Canal Company's irrigated lands?

20 A. Yes.

21 Q. And I understand that you participated in
22 developing that shapefile?

23 A. Yes, I did.

24 Q. Can you explain the process that you went
25 through to develop that?

1 A. As we looked at both 2011 and, I believe, 2013
2 aerial photography, we had done some prior work for
3 Twin Falls where we had some historical photography
4 for -- I think mostly areas along the boundary of the
5 delivery organization, so we had some history on what
6 had happened on some of those lands. So we tried to,
7 very carefully, identify acres that were either
8 irrigated in 2011 or 2013 or appeared they had been
9 irrigated in recent years.

10 Q. And the data that went into that was you had
11 aerial photography, I understand?

12 A. Yes.

13 Q. Or was it satellite imagery?

14 A. Aerial photography.

15 Q. Aerial photography.

16 And then you said on the fringes of the
17 company, you had some other type of information. Could
18 you clarify what that was?

19 A. Yes. We had some historical photography, some
20 old black-and-white photos from Department of Ag.

21 Q. Okay. And your goal was to identify acres
22 that were irrigated or had been irrigated in years past?

23 A. In recent years past, yes.

24 Q. Going how far back?

25 A. Well, the oldest photography I recall we used

1 was 2011, so it would have been that.

2 Q. And if you'll turn to page 5 of your report.

3 A. Okay.

4 Q. And my understanding is this is an aerial
5 image of a portion of Twin Falls Canal Company's service
6 area that shows which -- that uses highlighting to
7 identify which lands were shown as irrigated in the 2013
8 GIS map versus which lands are shown as irrigated under
9 the Department's 2017 irrigated lands dataset; is that
10 correct?

11 A. That's my understanding also, yes.

12 Q. So if I want to use this map to understand
13 just what was identified as irrigated in the 2013 GIS
14 shapefile, I should consider everything with blue
15 highlighting and yellow highlighting as having been
16 identified as irrigated lands in the 2013 shapefile?

17 A. Yes. It looks like there's some yellow over
18 the top of some of what we had already excluded. So it
19 isn't everything that was yellow.

20 Q. So this photograph with the highlighting in
21 blue, it has "2017 Irrigated Shape."

22 Do you see that?

23 A. Yes.

24 Q. So am I understanding correctly that
25 everything in blue is identified as irrigated lands in

1 the 2017 dataset?

2 A. That's my understanding, yes.

3 Q. And then the yellow there in the legend says
4 "2017 Difference." My understanding from talking to
5 Mr. Brockway is that the land identified in yellow was
6 shown as irrigated in the 2013 GIS shapefile but is not
7 shown as irrigated in the 2017 dataset.

8 Am I understanding that correctly?

9 A. I don't think so. If you look at -- this is
10 laying on its side, but the north/south yellow line kind
11 of through the middle, some of those -- some of that
12 area shows up as not being irrigated in the 2013
13 dataset, but is kind of merged with the yellow.

14 Q. Yes, I see that. So if I look approximately
15 in the center of the image, there's a horizontal sliver
16 that's not highlighted with either blue or yellow.

17 Do you see that?

18 A. Yes.

19 Q. And my understanding is that is the roadway
20 that had been excluded from the 2013 GIS analysis?

21 A. That's correct.

22 Q. And just north of that excluded sliver there's
23 a yellow parallel sliver, it's highlighted yellow that
24 refers to a roadway.

25 Is it your assumption that that roadway

1 identified in yellow, that's parallel, is the roadway
2 that was excluded in 2013?

3 A. The area that has no color on it is what was
4 excluded in 2013.

5 Q. Okay. And you heard me discuss with
6 Mr. Brockway or identify a number of farmsteads, and
7 there's a subdivision or development that shows as being
8 irrigated under the 2013 GIS shapefile?

9 A. Yes.

10 Q. And none of those farmsteads were excluded
11 from the 2013 GIS shapefile at least in this section of
12 the service area; correct?

13 A. Yeah, I don't have that in front of me. But,
14 yes, I understand that.

15 Q. As a general rule, when you were creating the
16 2013 GIS shapefile, you did not exclude these
17 residential properties that I've referred to as
18 "farmsteads"?

19 A. No, I -- I think I tried to exclude hardened
20 areas around farmsteads if there were large buildings or
21 something like that.

22 Q. Okay. But none of those are excluded from
23 either of these images?

24 A. Not from these images, no.

25 Q. Okay. And where there were subdivisions that

1 had been developed within the canal company service
2 area, did you go through and carve out the roads and
3 houses, or did you include the subdivision?

4 A. It's been too long, TJ. I remember I excluded
5 the whole Twin Falls metropolitan area, but I can't
6 remember for sure what we did with subdivisions.

7 Q. Okay. Generally, you were excluding land that
8 was not capable at all of being irrigated, like parking
9 lots and roads, things like that?

10 A. Yes.

11 Q. If it was irrigated or was capable of being
12 irrigated, you generally included those lands?

13 A. Yes.

14 Q. As part of your analysis, you did not make an
15 evaluation of supplemental groundwater rights within the
16 company's service area?

17 A. That's correct.

18 Q. Did you compare your -- the 2013 GIS shapefile
19 with company water delivery records to see if service
20 water deliveries corresponded with the shapefile?

21 A. I didn't do that. Mr. Barlogi, at the time,
22 was working in the central office, and I worked with him
23 to get -- to do that kind of analysis and review what I
24 had done.

25 Q. And you're not sure what he did in that

1 regard?

2 A. I'm not.

3 Q. You could have, with some additional time and
4 effort, carved out farmsteads and subdivision roads and
5 things like that if you had been asked to do that?

6 A. Well, at least as they existed in 2013,
7 whatever the latest photography we had.

8 Q. And had you been asked to make an analysis of
9 supplemental groundwater use, you had the ability to do
10 that at that time?

11 A. Well, you could make an estimate. I've worked
12 with place-of-use shapefiles from IDWR in other areas,
13 and I keep being reminded not to put a lot of confidence
14 in them.

15 I've also worked with WMIS data in other
16 areas, and it's difficult to get like minds to agree on
17 what the numbers are.

18 Q. You're familiar with the WMIS database?

19 A. Somewhat, yes.

20 Q. And, of course, you're very familiar with the
21 Department's water rights database?

22 A. Yes.

23 Q. And if somebody asked you to do your best to
24 analyze the extent of supplemental groundwater
25 irrigation, it's within your expertise to do that?

1 A. Yes.

2 Q. But you've not been asked to do that for
3 Twin Falls Canal Company?

4 A. That's correct.

5 Q. When that 2013 shapefile was created, I
6 understand that was created strictly by Twin Falls Canal
7 Company personnel and their consultants?

8 A. Yes.

9 Q. The Department was not involved as part of a
10 collaborative process?

11 A. That's correct.

12 Q. And groundwater users or others were also not
13 involved in that process?

14 A. That's correct.

15 Q. You understood at that time that it would
16 benefit Twin Falls Canal Company to have as many acres
17 identified as being irrigated as possible?

18 A. My direction was to accurately identify the
19 acres being irrigated.

20 Q. I understand that, but you did understand that
21 it would benefit the company to have as many acres
22 identified as irrigated as possible?

23 A. Well, within their decree, yes.

24 MR. BUDGE: Okay. I have no further
25 questions. Thank you.

1 Thanks, Dave.

2 HEARING OFFICER: Further cross-examination of
3 Mr. Shaw?

4 Mr. Bromley?

5 MR. BROMLEY: Just a few.

6

7 CROSS-EXAMINATION

8 QUESTIONS BY MR. BROMLEY:

9 Q. Hi, Mr. Shaw.

10 A. Mr. Bromley.

11 Q. Okay. Figure 5 --

12 Do you have your report there? It's on
13 page --

14 A. Yes.

15 Q. -- page 9.

16 So the Department's using the average of the
17 three preceding years to determine the crop mix; is that
18 correct?

19 A. That's the average crop mix, yes.

20 Q. But the Department's using the reference ET
21 from the current year and methodology; correct?

22 A. Correct.

23 Q. So isn't it true that the differences between
24 the 2018 to 2020 line and the 2021 line in Figure 5 are
25 largely due to discrepancies in reference ET between

1 those years not due to differences in cropping?

2 A. And this is just for illustration purposes to
3 show the difference that can occur between a three-year
4 average and the next year.

5 Unfortunately, I didn't have CDL data to show
6 here. So it's simply for illustration purposes.

7 Q. Thank you.

8 At the top of page 10, the first full
9 sentence, I'll just go ahead and read that.

10 It says: "In Manager Barlogi's deposition we
11 heard about the continual improvements being implemented
12 by the Twin Falls Canal Co. (TFCC), and when CWN's were
13 appropriately calculated, we believe those improvements
14 will show continued reasonable use of the water
15 resource."

16 Do you see that?

17 A. Yes.

18 Q. But as Dr. Brockway testified, if Twin Falls
19 Canal Company doesn't actually reduce its diversions,
20 then those improvements won't have any effect on the
21 efficiencies used in the methodology; correct?

22 A. No. That was a no. Okay.

23 Q. Thank you.

24 All right. Let's look at the bottom of
25 page 10, the last full sentence there, Mr. Shaw. And

1 I'll go ahead and read that.

2 A. I think we're -- maybe we're talking past each
3 other.

4 Q. Okay.

5 A. I did not agree with Dr. Brockway.

6 Q. Oh, you don't agree with Dr. Brockway?

7 A. No.

8 Q. How is that?

9 A. Can you read your original question back to
10 me?

11 Q. Sure thing. Absolutely.

12 So what we heard Dr. Brockway testify to a few
13 times, both on cross with Mr. Harris and then, again,
14 on, I believe, with City of Pocatello's attorney and,
15 possibly, then with groundwater district's attorney, was
16 that a number of statements that if Twin Falls Canal
17 Company doesn't reduce its diversions, then a lot of
18 what goes on in the calculations and the methodology
19 order just continue to show increased need, even if, for
20 example, acreage was reduced.

21 A. But if increases on diversions are necessary
22 to meet increased crop demand because of improved
23 efficiency from sprinklers or raising more
24 water-intensive crops, then that would show up in
25 improved efficiency, but it would not reduce diversions.

1 Q. Okay. So let me just ask the question one
2 last time. And just answer it, please, so we can make
3 sure that we're not talking past one another and that I
4 didn't mishear what you said and you didn't mishear the
5 question.

6 So as Dr. Brockway testified, if the canal
7 company doesn't reduce its diversions, then these
8 improvements won't have any effect on the efficiencies
9 used in the methodology; correct?

10 A. No, I don't think that is correct.

11 Q. So at bottom of page 10, then, I'll just read
12 this sentence -- the last sentence at the bottom of
13 page 10.

14 "Figure 6 below shows the changes in alfalfa
15 and corn acres since 2007 along with an increase in
16 diversions by Twin Falls Canal Company to meet the
17 demands of the more water-intensive crops."

18 And then we flip over to the next page, and we
19 see Figure 6. So Figure 6 is a little "apples and
20 oranges," isn't it? Because you're comparing alfalfa
21 and corn acres to Twin Falls Canal Company diversions in
22 acre-feet; correct?

23 A. Correct. That's why there are two y-axes.

24 Q. So you haven't actually computed the effect
25 that the changes in alfalfa and corn acres has on crop

1 water need in acre-feet, have you?

2 A. No, I haven't.

3 Q. Still on page 11, Mr. Shaw, above paragraph D,
4 the last paragraph there, there's discussion about
5 changes in delivery that have occurred within the area
6 of A&B Irrigation District.

7 Do you see that?

8 A. Yes, I do.

9 Q. Do you know if the A&B water rights have been
10 updated through transfers to allow for surface water use
11 on Unit B?

12 A. My recollection is they have a new permit for
13 those acres.

14 Q. So this is the pipeline, then, from the river
15 that's bringing surface water into some of those acres
16 on Unit B?

17 A. Yes.

18 Q. Okay. When I read it, it was a little unclear
19 to me if it was using -- I guess I would say, more
20 senior A&B rights for irrigation.

21 But you've answered my question, which is it's
22 that pipeline.

23 A. Yes.

24 Q. So thank you for that.

25 In your direct with Mr. Thompson, you said

1 Twin Falls Canal Company is a well-managed company
2 compared to other Idaho canal systems.

3 Do you remember that?

4 A. I do.

5 Q. Have any of the systems that you were thinking
6 of placed delivery calls?

7 A. Well, on some of those systems there are
8 people shut off every year to supply water for the
9 canal. That could be managed better.

10 Q. Okay. But have any of those companies filed a
11 delivery call under the conjunctive management rules?

12 A. I don't know.

13 Q. Thank you.

14 Let's flip back to page 2, and this is
15 paragraph 7.

16 And it says: "The company's" -- I'm sorry.
17 Let's go to the second sentence of paragraph 7.

18 "The company has no way of knowing whether
19 land covered by shares will or will not be irrigated and
20 must prepare to meet the share delivery obligation."

21 Do you see that?

22 A. I do.

23 Q. Wouldn't you agree, based on your experience,
24 Mr. Shaw, that farmers typically know which lands will
25 be irrigated prior to the irrigation season because

1 they've already made cropping decisions, bought seed,
2 bought chemicals?

3 A. Typically, yes.

4 Q. And in your experience for permissible places
5 of use, is it a typical condition that the Department
6 sometimes places, on rights with PPU's, to notify the
7 Department as to which acres are going to be irrigated?

8 A. If there is a --

9 COURT REPORTER: Okay. Wait. I didn't hear
10 that.

11 THE WITNESS: If there is a permissible place
12 of use placed on the water right, then, yes, to
13 Mr. Bromley's question.

14 Q. (BY MR. BROMLEY) So wouldn't it be reasonable
15 for the company to ask its shareholders to notify it
16 over the winter as to which acres will be irrigated and
17 what crops will be planted?

18 A. No. I think it's up to the water user. If I
19 am a water user, like Mr. Barlogi says, this is going to
20 be a short year, and I've got 80 acres in new alfalfa
21 and 40 acres of winter wheat, and I was going to plant
22 potatoes but decided, no, I'll save my water for the
23 crops I've got in the ground, I'm not going to irrigate
24 that 40. And I wouldn't get my full water delivery,
25 whatever it happens to be for the year, and I don't

1 think that matters to the companies.

2 Q. Okay. When I go over your Section 5 on crop
3 water need, Mr. Shaw, I see a lot of suggestions to the
4 Department as to how to get better and use more current
5 data to better understand crop water need.

6 Is that a fair summary of what you're asking?

7 A. Yes.

8 Q. And then in Part A, though, of your report
9 about Surface Water Coalition irrigated area,
10 particularly Twin Falls Canal Company, you're advocating
11 to use the 2017 shapefile for irrigated area for
12 Twin Falls Canal Company; correct?

13 A. Not the 2017 shapefile, I don't believe.

14 Q. So you're using the 2017 shapefile, and then
15 what are you doing with it?

16 A. We took the 2017 -- Mr. Brockway --
17 Dr. Brockway and his shop the 2017 raster irrigated
18 lands dataset and overlaid it over the 2013 shape that
19 had been prepared for Twin Falls Canal Company. I don't
20 think there's a recommendation that the 2017 be the
21 determination of acres for Twin Falls Canal Company.

22 Q. So the methodology order is using 2017 acres,
23 the 2017 shapefile; correct?

24 A. No.

25 Q. No?

1 A. To my understanding, it's using the
2 194,000 acres from the 2013.

3 Q. Oh, that's correct. I'm sorry. That's a bad
4 question.

5 So what you're advocating, though, for, with
6 acres, is something that's from 2013, 2017 that's old
7 data; correct?

8 A. Yeah. Well, its four years old, yes.

9 Q. But with crop water need, you're asking for
10 current data, last year's data, as recent data as you
11 can get; correct?

12 A. Well, crop water -- crop mixes can change from
13 year to year, we know that, and that's a critical
14 element in calculating crop water need that hasn't been,
15 in my opinion, appropriately used. Irrigated acres may
16 change over time. If there were resources to update
17 that shapefile every year, you would have -- that would
18 be the best solution. But we haven't seen that happen.

19 Q. And it would be seem to be consistent that if
20 we're looking for use of best available information to
21 use, in fact, what is best available information;
22 correct?

23 A. And right now that's the 2013 shape.

24 Q. Even though that's from 2013 and we're in
25 2022?

1 A. That's the best available we have, yes.

2 MR. BROMLEY: Nothing further. Thank you.

3 HEARING OFFICER: Additional
4 cross-examination?

5 I don't see any hands in the air.

6 Redirect, Mr. Thompson?

7 MR. THOMPSON: I don't have anything.

8 HEARING OFFICER: Okay. Thank you, Mr. Shaw.
9 Next witness?

10 Do we have another witness? I'm looking at
11 the list, and I don't recall whether Alan Jackson
12 intended to testify, whether the parties intended to
13 call Alan Jackson.

14 MR. ANDERSON: No.

15 HEARING OFFICER: Do not intend to call
16 Mr. Jackson?

17 MR. ANDERSON: No.

18 HEARING OFFICER: Are there any other
19 witnesses slated to be called?

20 Mr. Anderson?

21 MR. ANDERSON: I don't think so. I just had a
22 quick offer of proof I was going to put into the record.

23 HEARING OFFICER: Okay.

24 MR. ANDERSON: If that's appropriate now. I
25 don't think we have any -- I created a quick outline

1 just to make it quick. I know we're -- it's Friday.

2 HEARING OFFICER: Well, in addition, I think
3 we may have some rebuttal witnesses.

4 MR. ANDERSON: Right.

5 MR. FLETCHER: So far everyone said they don't
6 have any rebuttal.

7 HEARING OFFICER: Well, I think the Department
8 intends to recall Matt Anders, at least.

9 MR. ANDERSON: Well, I would think this would
10 be appropriate before case in chief, if that's all
11 right?

12 Just some quick background, Director. We have
13 requested Mat Weaver as a witness; that was denied.

14 There are two exhibits identified in the
15 City's exhibits -- one is Exhibit 340, one is 354 -- and
16 then there are some questions and topics that would have
17 come out of those exhibits. I've put those in outline
18 form. I'd just like to offer that as an offer of proof.

19 MS. MCHUGH: You're offering those two
20 exhibits as the offer of proof?

21 MR. ANDERSON: Well, and the information, as
22 well, contained in the outline. Along with those
23 exhibits, there would have been questions, had he been
24 made available as a witness.

25 MR. FLETCHER: Can we address that?

1 HEARING OFFICER: Yeah. I don't even
2 understand what I have in front of me.

3 MR. ANDERSON: Sure. I can explain a little
4 bit.

5 Just in offering the exhibits as well as the
6 not being able to question Mat Weaver and not having him
7 made available as a witness, this is the evidence that
8 we believe he would be able to testify to. He would
9 have answers to these questions. We believe that
10 they're relevant to the methodology order, to the
11 amendments made.

12 Both of these exhibits show examples of
13 information about the methodology order to individuals
14 outside the Department and also gathering information
15 from individuals outside the Department, and so that's
16 why. That's the gist of our offer of proof. If there
17 are any questions, I can go into further detail.

18 HEARING OFFICER: Mr. Fletcher?

19 MR. FLETCHER: Yeah, we'd move to strike this
20 and these exhibits. These were settlement documents.
21 They say right on the documents they're for purposes of
22 settlement discussion.

23 We just had a hearing in front of the Director
24 where this issue came up about trying to present
25 settlement discussion topics to the Director, and the

1 Director ruled that no settlement discussion would be
2 allowed, and this is a backdoor attempt to do that very
3 thing. And so we would ask that this be stricken from
4 the record and that it not be considered since it is
5 purely settlement discussion material.

6 MR. ANDERSON: If I could address that?

7 HEARING OFFICER: Okay, Mr. Anderson.

8 MR. ANDERSON: I don't think we're offering
9 this for the proof of the matter. There's nothing about
10 these documents that we're saying, you know, that you
11 need to consider even the content of the documents.
12 What we're saying here is there's evidence that --
13 information from the settlement agreement was used in
14 the amendments of the methodology order.

15 HEARING OFFICER: By what? By a string of
16 emails?

17 MR. ANDERSON: Well, the string of emails
18 suggests that there was -- that the negotiations will
19 inform the urgency of the finalization of the amendment
20 to the methodology order. That suggests that there was
21 information that came from the negotiations and, again,
22 as far as settlement -- the privilege of settlement
23 documents and settlement negotiations, again, we're not
24 offering this for the proof of the matter. It's to show
25 that information was used from those settlement

1 agreements to go to the methodology order. I think it's
2 completely different, and it's not excluded by that
3 evidentiary rule.

4 HEARING OFFICER: Okay. Mr. Anderson, I'm not
5 even accepting this. I will tell you that I am always
6 meeting with staff trying to establish priorities as to
7 what I need to work on and what I don't need to work on,
8 and that's what I'm doing here.

9 MR. ANDERSON: Well, I'm not intending to try
10 to make you a witness, Director. I just -- this is
11 information that was disclosed to us as part of a
12 request.

13 HEARING OFFICER: That's fine. And we
14 supplied this information in good faith, but I don't see
15 anything in this that would either establish any
16 nefarious intent or any reason to bring in this document
17 that was -- I've never seen this document that I'm aware
18 of. SWC discussion points, main discussion points, I've
19 never seen any of this, and I think it's because it was
20 part of settlement, and I was excluded from those
21 discussions.

22 So my string of emails in here and what's
23 included simply was an attempt on my part to say what do
24 we need to prioritize and work on in the many
25 responsibilities that the Department and the Director

1 has, and that was the intent of these emails. And we
2 disclosed them in good faith, and I guess, from my
3 perspective, for you to even insinuate that there was
4 something nefarious, I find to be offensive, and I won't
5 let it in. Thank you.

6 MR. ANDERSON: Okay.

7 HEARING OFFICER: Make sure we don't have that
8 in the documents.

9 Okay. Rebuttal witnesses, Mr. Johns?

10 MR. JOHNS: I'd like to call Bryce Contor to
11 rebut Mr. Brockway and Mr. Shaw's testimony, just
12 briefly.

13 HEARING OFFICER: Do you want to wait until
14 after Mr. Anders testifies, or do you want to call him
15 now? I guess in the order of presentation, I'd prefer
16 to have Mr. Anders go first.

17 MR. JOHNS: That works.

18 HEARING OFFICER: It seems to me it would work
19 better for you as well.

20 MR. JOHNS: I think so. Thank you,
21 Mr. Director.

22 HEARING OFFICER: There's Matt Anders.

23 If you'll come forward, Mr. Anders. You're
24 already sworn in.

25 THE WITNESS: Oh, all right.

1 HEARING OFFICER: Please be seated.

2
3 MATTHEW ANDERS, P.G.,
4 called as a rebuttal witness by IDWR having been
5 previously duly sworn to tell the truth relating to said
6 cause, testified as follows:
7

8 DIRECT EXAMINATION

9 QUESTIONS BY MR. WOOD:

10 Q. Hello, Matt.

11 A. Good afternoon.

12 Q. I realize you've already testified in this
13 matter, but can you please state and spell your name for
14 the record one last time.

15 A. Sure. Matt Anders, M-a-t-t, A-n-d-e-r-s.

16 Q. And can you briefly tell us where you work and
17 what role you played in developing the Fifth Methodology
18 Order?

19 A. Yeah, I work for the Idaho Department of Water
20 Resources. I did research and development on some of
21 the methods in updating the method in the Fifth
22 Methodology Order. I also participated in drafting
23 portions of the order.

24 Q. And did you listen to the testimony of Bryce
25 Contor and Sophia Sigstedt yesterday?

1 A. I did.

2 Q. Matt, can you please find Ms. Sigstedt's
3 expert report which was previously admitted as
4 Exhibit 837. And I'll have you turn to page 20 --
5 Exhibit 837, page 20, not page 16 of her report.

6 A. Page 20, I'm there.

7 Q. And does that have a bell-shaped figure at the
8 top?

9 A. Yep, a blue one.

10 Q. And can you please find the sentence about
11 halfway down the first paragraph that reads, "for 2018
12 there is a note"?

13 A. Yes, I see it.

14 HEARING OFFICER: Where are you again? I'm
15 sorry.

16 MR. WOOD: Yeah. So it's Exhibit 837,
17 page 20, but realizing that there's -- the document has
18 two different page numbers on it. So this one says
19 "Exhibit 837, page 20" as opposed to the actual number
20 of the document, which is 16.

21 HEARING OFFICER: I'm with you.

22 Q. (BY MR. WOOD) And can you find that sentence
23 about halfway down that starts, "For 2018 there is a
24 note"?

25 A. Yes, I found it.

1 Q. Can you please read that sentence into the
2 record.

3 A. "For 2018 there is a note about AFRD2
4 recharging between 5,000 - 10,000 acre-feet of recharge
5 to Mile Post 31 for Magic Valley Ground Water District,
6 and the calculation shows only 5,000 acre-feet of
7 recharge was accounted for."

8 Q. And what is your understanding of what
9 Ms. Sigstedt meant by that sentence?

10 A. My interpretation is that she's saying that we
11 have missed or not adjusted the diversion for AFRD2 for
12 5,000 acre-feet.

13 Q. And have you had a chance to investigate that
14 allegation?

15 A. I did.

16 Q. And what was your conclusion?

17 A. So after Ms. Sigstedt's testimony yesterday,
18 Kara Ferguson and I looked through the calculator, and
19 we found the note that she was referring to. And it's
20 on the "Demand" tab, and it's where we're adjusting the
21 demand for recharge and wheeled water.

22 And we looked at it, and she is correct, there
23 was an adjustment for 5,000 based on the recharge -- the
24 way we do our recharge adjustments. In this case, for
25 recharge, it's a subtraction.

1 But we also found that in what we call the
2 "adjustment side," the adjustments coming from -- the
3 lease is coming from Water District 1. There were two
4 private leases in there as well, for 10,000 acre-feet.

5 So what we concluded was that -- what we
6 should have done was subtract 10,000 acre-feet from
7 AFRD2's diversion in 2018 for this recharge that she is
8 referring to.

9 In actuality, we subtracted 15,000. And we
10 think that's because the data are coming to us from two
11 different places. We get them from the recharge program
12 here at IDWR, and we get them from Water District 1.
13 And those leases and that note were referring to the
14 same water, but we didn't realize it. So we subtracted
15 too much from AFRD2 in that case. So there is an error
16 in our baseline year for AFRD2. It's 5,000 acre-feet
17 too low.

18 Q. Too low?

19 A. Yes.

20 Q. Can you please read the next sentence, the one
21 starting with "Additionally, IGWA's settlement."

22 A. Okay. "Additionally, IGWA's settlement
23 performance report shows almost 4,000 acre-feet of
24 recharge by North Snake Groundwater District through
25 North Side Canal Company that is not accounted."

1 Q. And what is your understanding of what
2 Ms. Sigstedt meant by that sentence?

3 A. Similar to the previous line, she thinks
4 that -- or my interpretation is she thinks we have -- we
5 missed making an adjustment for 5,000 acre-feet of
6 recharge for Magic Valley.

7 Q. And have you had a chance to investigate this
8 allegation?

9 A. We did.

10 Q. And what did you conclude?

11 A. So, again, we -- after her testimony
12 yesterday, we were looking through the adjustments for
13 Magic Valley Ground Water District -- maybe I should
14 back up.

15 So we recorded the baseline year at the
16 technical working group. And based on discussions with
17 the technical working group, we decided we needed to go
18 back through the adjustments and make sure that we had
19 everything. Because we were going to use 2018 as a
20 baseline year.

21 In that second review, Kara found that we had
22 missed this 4,000 acre-feet that Ms. Sigstedt is
23 referring to. So at the time of the technical working
24 group, we didn't have it in the baseline there. We
25 hadn't made the subtraction. But for the Fifth

1 Methodology Order, we did do the subtraction.

2 So there was a change in the numbers between
3 the technical working group and the Fifth -- what
4 actually came out in the Fifth Methodology.

5 Q. But the numbers in the Fifth Methodology Order
6 are correct; is that true?

7 A. Yes, they are correct in this case.

8 Q. Matt, can you now turn to page 28 again, of
9 Exhibit 837.

10 A. Okay. I am on page 28.

11 Q. And do you see the paragraph entitled, "2.4.4
12 Bias in 2018 Baseline Year for Reasonable Carryover."

13 A. I do.

14 Q. And can you find the sentence about halfway
15 through that starts "Figure 2-10 is IDWR's hindcast"?

16 A. So "Figure 2-10 is IDWR's hindcast analysis
17 showing annual carryover volumes for Twin Falls Canal
18 Company 1995 to 2022 under the Fourth Methodology Order
19 (baseline year 06/08/12) and the Fifth Methodology Order
20 (baseline year 2018)."

21 Q. Now, can you turn to Exhibit 300, which is the
22 Fifth Methodology Order.

23 A. Okay. I have that.

24 Q. Well, let me back up. Let me back up for just
25 a second.

1 Can you read the final sentence of that
2 paragraph. I believe you didn't read the final
3 sentence.

4 A. Oh, back on page 28?

5 Q. Yes. I'm sorry.

6 A. Okay. No problem.

7 "Under the Fifth Methodology Order, 19 out of
8 the 30 years would have resulted in a carryover
9 shortfall and that these occurred even in average and
10 above-average years. Figure 2-1."

11 Q. Okay. So now let's turn to the Fifth
12 Methodology Order, which is in Exhibit 300.

13 A. Yes.

14 Q. And can you turn to page 28 -- excuse me --
15 23. And I'm looking for paragraph 68.

16 A. You said 23?

17 Q. Page 23, yes.

18 A. Okay. I'm on page 23, and I see paragraph 68.

19 Q. Can you explain what information is contained
20 in paragraph 68?

21 A. So this paragraph describes the calculation
22 that we use for calculating what we referred to as
23 "maximum projected carryover need."

24 We take the projected -- yes, the projected
25 demand of the 2018 baseline year, and we subtract the

1 projected supply, which is the average supply for the
2 '02-'04 irrigation seasons.

3 And then under it is a table that shows the
4 calculation -- the numbers used in the calculation. And
5 then on the right is the maximum projected carryover
6 need.

7 Q. And can you read the footnote that's in
8 Footnote 18 there?

9 A. "This Fifth Methodology Order updates this
10 chart with the baseline year and calculates new maximum
11 projected carryover need values."

12 Q. And can you now turn to paragraph 78, which is
13 on page 29.

14 A. You said 78?

15 Q. 78.

16 A. Okay. I'm on page 29. I see 78.

17 Q. Can you explain what information is contained
18 in paragraph 78?

19 A. So paragraph 78 is the reasonable carryover
20 values that we are assigning for the Fifth Methodology.

21 In the pages that we went -- that we just went
22 through before the -- between the previous table on
23 page 23 and here on 29, we do some additional analysis,
24 and we adjust some of the numbers.

25 So we adjust the maximum projected carryover

1 need numbers from the table in 68. Three of those we've
2 adjusted in Table 78: AFRD2, BID, and Twin Falls Canal
3 Company.

4 Q. And so am I correct in understanding that the
5 Fifth Methodology Order used the adjusted carryover data
6 in paragraph 78, not the maximum projected carryover
7 data in paragraph 68?

8 A. That is correct.

9 Q. And Ms. Sigstedt's conclusion was based on the
10 maximum carryover data in paragraph 68; is that correct?

11 A. I believe -- I'm not totally sure, but I
12 believe that that was the case.

13 Q. And so Ms. Sigstedt -- if that's true, then
14 Ms. Sigstedt's conclusion that 19 out of the last
15 30 years would result in carryover shortfall was based
16 on incorrect data; is that right?

17 A. Yes, that is correct.

18 Q. And when the adjusted carryover data in
19 paragraph 78 is used, the proper data that was used in
20 the Fifth Methodology Order, how many years out of the
21 last 30 would have resulted in a shortfall?

22 A. Six.

23 MR. WOOD: Nothing further.

24 HEARING OFFICER: Okay. Examination? What's
25 the order of examination? Do we have the groundwater

1 users go first?

2 Okay. Mr. Budge.

3
4 CROSS-EXAMINATION

5 QUESTIONS BY MR. BUDGE:

6 Q. Matt, you had so much fun on Tuesday that you
7 wanted to come back.

8 A. It's hard to resist. I agree.

9 Q. I just have a few follow-up questions on
10 several of your comments related to the expert report of
11 Sophia Sigstedt.

12 The first discussion that you have with
13 Mr. Wood was related to some of the recharge data of
14 AFRD2 and North Side Canal Company.

15 Do you recall that?

16 A. Yes, I do.

17 Q. And Ms. Sigstedt's comments were based on
18 information the Department had produced concerning that
19 aspect of the methodology order?

20 A. Yeah, the first --

21 Q. I'll reask the question.

22 A. Yeah.

23 Q. There was a discussion about how much recharge
24 had happened through AFRD2.

25 Do you remember that?

1 A. Yes.

2 Q. And Ms. Sigstedt cited a Department document
3 that showed that there had been between
4 5,010,000 acre-feet of recharge through AFRD2?

5 A. Yes. The note that she is referring to
6 comes -- is in our -- what we call "our calculator."

7 Q. And then when she brought that to the
8 Department's attention, that caused you and Kara
9 Ferguson to go explore that further?

10 A. Yes. Yep.

11 Q. You're not suggesting that Sophia made any
12 type of intentional error or intentionally tried to
13 mislead the Director by pointing that out in her report?

14 A. Oh, no. Certainly not. I mean, it was poorly
15 documented in the calculator, it was ambiguous in there.
16 And these are the kinds of things we want, the
17 consultants to point out to us, like, you made an error,
18 here, fix this, fix that.

19 So, no, not at all.

20 Q. Okay. And the same would be true for the
21 issue involving North Side Canal Company recharge?

22 A. Yeah, the adjustments are very confusing, so
23 it's hard to know if everything got included. So we
24 appreciate the check.

25 Q. Okay. The Department didn't -- before issuing

1 the Fifth Methodology Order, there wasn't, like, a draft
2 order that was provided for review by the parties;
3 right? It was just issued on April 21st and implemented
4 immediately?

5 A. That is correct.

6 Q. Had the process started sooner with either a
7 hearing or some other collaborative process, these types
8 of issues may have been raised before the Fifth
9 Methodology Order was issued?

10 A. Possibly. Once we're drafting, things are
11 always in flux. It's possible that we could have talked
12 to them, but it's not guaranteed.

13 Q. I understand.

14 And you've sat through most of the hearing?

15 A. Yeah, I have. I've sat through all of it.

16 Q. Have you learned information at the hearing
17 that you think may be useful or inform changes in the
18 methodology in the future that may help it function more
19 effectively?

20 A. Yeah --

21 MR. WOOD: Director, I'm going to object to
22 that. That's outside the scope.

23 HEARING OFFICER: Sustained.

24 Q. (BY MR. BUDGE) Matt, have you learned
25 anything at the hearing that may cause you to go back

1 and revisit certain parts of the Fifth Methodology
2 Order?

3 MR. WOOD: Same objection.

4 HEARING OFFICER: Sustained.

5 MR. BUDGE: No further questions.

6 HEARING OFFICER: Thank you.

7 Other cross-examination? Any more questions
8 for Mr. Anders?

9 I guess one of the reasons for my sustaining
10 the objection is that the focus of the question -- or
11 the focus of the questioning was very narrow in its
12 scope to correct some information.

13 Thank you, Mr. Anders.

14 THE WITNESS: Thank you.

15 HEARING OFFICER: Now, I don't think -- I
16 don't think the Department has any other information to
17 put on in rebuttal.

18 MR. WOOD: That's correct.

19 HEARING OFFICER: Okay. We have a request for
20 some additional rebuttal.

21 Was that from you, Mr. Johns?

22 MR. JOHNS: That's correct.

23 HEARING OFFICER: Okay.

24 MR. JOHNS: I'd like to call Bryce Contor back
25 to the stand.

1 HEARING OFFICER: Mr. Contor, you're already
2 sworn in. If you'll take a seat.

3 MR. JOHNS: Just one item, Director, and I
4 talked with the Surface Water Coalition, and I assume
5 the groundwater folks are okay, but we would like to
6 offer Exhibits 502, 504, 505, 506, and 515 and request
7 that they be admitted by stipulation.

8 HEARING OFFICER: Give me the numbers again.

9 MR. JOHNS: 502, 504, 505, 506, and 515.

10 HEARING OFFICER: And you represented that
11 you've spoken to the Surface Water Coalition. What's
12 the result of those conversations?

13 MR. JOHNS: I believe that they were okay with
14 stipulating to the admission of those exhibits.

15 MR. FLETCHER: Did you say something? No.
16 We're good.

17 MR. JOHNS: And yeah, 502, 504, 505, 506, and
18 515.

19 MR. THOMPSON: [Unintelligible.]

20 COURT REPORTER: I can't hear you,
21 Mr. Thompson.

22 I couldn't hear what he said.

23 MR. FLETCHER: Can you repeat those again
24 slowly?

25 MR. JOHNS: 502, 504, 505, 506, and 515.

1 HEARING OFFICER: And based on your question,
2 Mr. Fletcher, are these references a matter of first
3 impression with you?

4 MR. FLETCHER: No. I was -- no. I should do
5 one thing to the latest. I was going to ask the last
6 witness if AFRD2 got paid extra for the extra 15,000
7 that was reported, but I'm trying to keep this moving
8 along.

9 HEARING OFFICER: So is there stipulation to
10 the admission of these exhibits that have been --

11 MR. FLETCHER: There is from us.

12 HEARING OFFICER: Pardon me?

13 MR. SIMPSON: From us.

14 MR. FLETCHER: There is from the SWC.

15 HEARING OFFICER: And I assume there are no
16 other objections.

17 All right. The documents that have been
18 marked as Exhibits 502, 504, 505, 506, and 515 are
19 received into evidence.

20 (Exhibits 502, 504 - 506, 515 received.)

21 MR. JOHNS: Thank you, Mr. Director. And I'll
22 try to be concise with my rebuttal here.

23 ///

24 ///

25 ///

1 BRYCE CONTOR,

2 called as a rebuttal witness by the Bonneville-Jefferson
3 Ground Water District, having been previously first duly
4 sworn to tell the truth relating to said cause,
5 testified as follows:

6
7 DIRECT EXAMINATION

8 QUESTIONS BY MR. JOHNS:

9 Q. Bryce, welcome back up to the stand.

10 A. Thank you.

11 Q. Just briefly, were you present during the
12 testimony of Mr. Brockway and Mr. Shaw?

13 A. Yes.

14 Q. Do you recall discussions regarding fallowing
15 of acres and how that factors into calculations in the
16 methodology order?

17 A. Yes.

18 Q. Okay. Have you performed technical work
19 pertaining to the fallowed acres similar in this regard?

20 A. Yes. When I was making recommendations in the
21 Snake River Basin Adjudication, I had to look at
22 parcels -- aerial imagery and decide whether a field
23 that was not green in that particular image was in
24 general irrigated.

25 When I worked for IWRRRI on the water budget

1 for the ESPAM model, we had to wrestle the same question
2 in preparing the irrigated lands dataset. And now as I
3 work helping clients prepare their claims in the Bear
4 River Basin Adjudication, I have to wrestle the same
5 question.

6 Q. So you have some expertise in this area?

7 A. Yes.

8 Q. Thank you.

9 MR. JOHNS: Would we be able to bring up -- or
10 give him a copy of Exhibit 4?

11 MR. WOOD: Exhibit 4?

12 MR. JOHNS: Correct.

13 THE WITNESS: I have it here.

14 Q. (BY MR. JOHNS) Okay. Could you turn to
15 page 2, and just quickly look over that. I just want to
16 ask you just a couple questions that came up during
17 Mr. Brockway and Mr. Shaw's discussions with counsel.

18 A. The one I have, the pages are not numbered,
19 but I'm looking under Heading A, "Evaluation of TFCC
20 Project Acres."

21 Q. And Item 5?

22 A. Item 5 is -- Item 5 that page is numbered, and
23 it is numbered 2. Yes, I see that, Item 5.

24 Q. Now, I'm just going to ask you a couple
25 questions.

1 First, is it reasonable that some fields would
2 be fallowed in some years?

3 A. Yes.

4 Q. How so?

5 A. Well, so Dr. Brockway described a number of
6 reasons that could occur. I think Mr. Barlogi did. And
7 for the most part, those ring true to me. I couldn't
8 repeat every discussion that they gave.

9 Q. But you agree it would be technically
10 defensible to factor that into the methodology order?

11 A. Yes.

12 Q. If you were assigned to count acres, how would
13 you treat fallowed acres?

14 A. So it would depend on the purpose. If I were
15 trying to describe a permissible place of use, if I were
16 trying to describe historical irrigation over a period
17 of years, if I were trying to describe a service area,
18 those acres definitely would want to be included if --
19 unless they were -- had never, ever been irrigated.

20 Q. But in a future year, that field might not be
21 fallowed?

22 A. Yeah, that's right. And so I didn't finish.
23 I'm sorry. If I was trying to determine the actual
24 quantity or amount of irrigated acres, then for that
25 year, those acres should need to be excluded.

1 Q. So excluding the fallowed acres would not
2 distort the total acreage?

3 A. No, because, as I think Dr. Brockway
4 explained, this parcel may be fallowed this year and
5 irrigated in the next year. But the underlying
6 mechanisms that caused the fallowing, that caused the
7 rotation, those will be ongoing. And so this parcel
8 becomes irrigated, this parcel becomes fallowed next
9 year, the -- not only would excluding them be
10 technically defensible, it would be more defensible and
11 more correct than including those.

12 Q. Anything else you need to add on fallowed
13 acres that was discussed?

14 A. I don't think so, thank you.

15 MR. JOHNS: I don't have any more questions.

16 HEARING OFFICER: Cross-examination of the
17 witness, Surface Water Coalition?

18 Do you need a moment?

19 MR. FLETCHER: No. I just -- I didn't really
20 understand some of the testimony.

21 HEARING OFFICER: Okay. Mr. Fletcher.

22 MR. FLETCHER: Thank you.

23 ///

24 ///

25 ///

1 CROSS-EXAMINATION

2 QUESTIONS BY MR. FLETCHER:

3 Q. Thank you. Mr. Contor, I just need some
4 clarification.5 So when you say a fallow acre should be
6 excluded, excluded from what?

7 A. Oh, I'm sorry. Yeah, that was unclear.

8 So from the calculation of actual irrigated
9 acres in a year when we're doing the evaluation, if that
10 acre is not irrigated in that year, it should not be
11 counted.12 Q. Okay. So if an acre on Twin Falls Canal
13 Company, for example, is fallowed -- say a corner of a
14 pivot, for example -- does that clearly indicate that
15 the shares attributable to those acres aren't being used
16 elsewhere?17 A. I don't think it does. But the underlying
18 assumption is that if those shares are being irrigated
19 elsewhere, that irrigation will appear in the dataset.
20 And then in a following year, if that irrigation is
21 moved back to this corner, then it will have to
22 disappear from where it was, and that's the rationale.23 Q. So if -- are you saying that somehow each year
24 someone should determine the actual irrigated acre s in
25 that irrigation season?

1 A. So I'm saying that that may -- that is the
2 best available science, whether it's attainable is a
3 different question. What I'm saying is, is that if
4 you -- it's going to be what I would call a "dynamic
5 equilibrium." So this year this one's irrigated, this
6 one's fallow; next year this one's irrigated, this one's
7 fallow; next year this one's irrigated, this one's
8 fallow. But any one of those snapshots would be a
9 reasonable representation of the ongoing dynamic
10 irrigated area.

11 All of the mechanisms that Dr. Brockway talked
12 about, in my estimation, would be relatively constant
13 year to year. That's what I was trying to say. So if
14 you want to know exactly where every irrigated acre is,
15 then, yes, you would have to do it every year. But if
16 you want to know the quantity, the periodic snapshots
17 should be adequate.

18 Q. Just because a farmer fallows an acre one year
19 doesn't mean he, necessarily, fallows any acres the next
20 year?

21 A. For an individual farmer, that is correct, but
22 all of the mechanisms that Dr. Brockway described would
23 operate in every year, and they would have similar
24 effects year to year.

25 Q. So the Department is using data from prior

1 years in order to make this calculation; correct?

2 A. So currently, yes.

3 Q. And the shapefiles it's using are from prior
4 years; correct?

5 A. Yes.

6 Q. So I guess it's your testimony that if an acre
7 shows up as being fallow but has a right to be
8 irrigated, it should not be included in the current year
9 even though it could be irrigated in the current year?

10 A. So my testimony is that if the goal is to use
11 prior data to do an estimate of the total quantity of
12 acres that would be irrigated in the current year, that
13 the best estimate -- given the fact that we have to use
14 old data because the current year hasn't occurred yet --
15 the best estimate of what would happen in 2023 would be
16 what actually happened in 2022.

17 And if in 2022 some random fraction of acres,
18 for a number of reasons that Dr. Brockway explained
19 well, were not irrigated, it's likely that under those
20 same mechanisms, approximately the same number of acres
21 in 2023 also would not be irrigated. The probability
22 that they would be the exact same locations is fairly
23 low. But the probability that the 2022 representation
24 would be the total correct number of acres is fairly
25 high.

1 Q. You would agree with -- I think it was
2 Dave Shaw's testimony that each farmer makes his own
3 determinations; correct?

4 A. I would agree with that, yes.

5 Q. And it's not the canal company making that
6 determination?

7 A. I would agree.

8 Q. And the farmer is determining if he's laying
9 1 acre fallow or not fallow in any particular year?

10 A. I agree.

11 MR. FLETCHER: Thank you.

12 HEARING OFFICER: Redirect, Mr. Johns?

13 Do you have questions, Mr. Harris?

14 MR. HARRIS: I do have some follow-up.

15 HEARING OFFICER: Go ahead.

16 MR. JOHNS: Go ahead.

17
18 CROSS-EXAMINATION

19 QUESTIONS BY MR. HARRIS:

20 Q. Mr. Contor, just to pick up from
21 Mr. Fletcher's comments.

22 It's your understanding that irrigated acres
23 is part of the methodology order; correct?

24 A. Yes.

25 Q. And the shapefile that was actually used in

1 the methodology order was the 2013 shapefile, which
2 essentially is -- it's 194,732 acres?

3 A. Yes.

4 Q. There's a more recent shapefile that has less
5 acres than that; correct?

6 A. That's my understanding.

7 Q. And that was not used in the methodology
8 order?

9 A. That's my understanding.

10 MR. HARRIS: Okay. No further questions.

11 HEARING OFFICER: Any recross? I assume no
12 recross.

13 MR. FLETCHER: No recross. That's not mine.

14 HEARING OFFICER: Well, I guess --

15 MR. FLETCHER: It wouldn't be me. It's his
16 counsel.

17 HEARING OFFICER: Well, let's call it.

18 Is there any further examination of
19 Mr. Contor?

20 I appreciate Mr. Contor being here for the
21 duration.

22 Thank you, Mr. Contor.

23 Are there other witnesses?

24 I see heads shaking no.

25 Ms. McHugh's negotiated the cords once more.

1 Do you have something to say?

2 MS. MCHUGH: I was just getting close to a mic
3 once we start discussing exhibits.

4 HEARING OFFICER: All right. Well, before we
5 do that, let's break for 15 and come back. We've been
6 here for almost two hours, and everybody can organize
7 their thoughts and maybe organize their notes.

8 Come back at quarter after.

9 (Break taken.)

10 HEARING OFFICER: Back on the record.

11 Are we on?

12 COURT REPORTER: Yes.

13 HEARING OFFICER: Thank you, Andrea.

14 Are you at the podium to lead the discussion?

15 MS. MCHUGH: I'm at the podium to just offer
16 the fact that I believe we have a stipulation to three
17 more exhibits to be admitted into the record, and then
18 I'm going to be done.

19 HEARING OFFICER: Okay.

20 MS. MCHUGH: So Exhibit 348, 349, and 350,
21 which are summaries of the City of Pocatello, City of
22 Idaho Falls, and Coalition of Cities water rights.

23 HEARING OFFICER: 348, 349, and 350.

24 And the parties have discussed these three
25 exhibits? There's a stipulation for admission?

1 MR. FLETCHER: Yes.

2 MR. SIMPSON: Yes.

3 HEARING OFFICER: I hear no negatives.

4 MS. MCHUGH: They're all falling in line right
5 now.

6 HEARING OFFICER: Okay.

7 MS. MCHUGH: Thank you.

8 HEARING OFFICER: So the documents marked as
9 Exhibit 348, 349, and 350 are received into evidence.

10 (Exhibits 348 - 350 received.)

11 HEARING OFFICER: Have the parties reviewed
12 the compilation of admitted exhibits, and is there any
13 discrepancy?

14 Ms. Patterson?

15 MS. PATTERSON: No discrepancy. It looked
16 accurate.

17 So I thank everybody, including our court
18 reporter and Sarah, for keeping track of those.

19 IGWA would like to, with the stipulation of
20 the other parties, admit the documents that were
21 presented to the technical working group. And those are
22 exhibits -- they're common exhibits, 900, 901, 902, 903,
23 904, 905, 906, 908, 909, 910, 912, 914 was previously
24 admitted, and 928, which was discussed.

25 HEARING OFFICER: And have all of these

1 documents been reviewed by the parties?

2 Are these documents that were reviewed or
3 presented by the Department to the technical working
4 group?

5 MS. PATTERSON: They were presented to the
6 Department for the technical working group, and they
7 were made available by the Department as a part of its
8 notice of what the parties may take -- may use for the
9 scope of this hearing.

10 HEARING OFFICER: Okay. So based on the
11 represented -- or represented stipulation, I will
12 receive into evidence the documents marked as
13 Exhibits 900, 901, 902, 903, 904, 905, 906, 908, 909,
14 910, 912, and 928.

15 Is that correct? Is that comprehensive?

16 MS. PATTERSON: That is.

17 (Exhibits 900 - 906, 908 - 910, 912, and 928
18 received.)

19 MS. PATTERSON: And we have one last item.

20 Director, if you'll recall, at the end of
21 Sophia's testimony you asked her about a portion of the
22 report where it looked like there was a typo.

23 Ms. Sigstedt confirmed that that was a typo,
24 and she sent in an updated expert report which removes
25 the errata. I've circulated, for the parties, the

1 redline version so you can see what was updated, and we
2 have a clean updated report that I would like to label
3 as 837A, similar --

4 HEARING OFFICER: What's the number?

5 MS. PATTERSON: 837A.

6 And this is similar to what the Cities did for
7 the updated report of Mr. Sullivan.

8 And so I would just ask that, you know, where
9 we reference 837 in the record, we'll actually be
10 referring to the updated report which removes errata.

11 (Exhibit 837A marked.)

12 HEARING OFFICER: So are you moving for the
13 admission of 837A --

14 MS. PATTERSON: That is correct.

15 HEARING OFFICER: -- what has been marked as
16 837A?

17 MS. PATTERSON: It's the updated expert report
18 of Sophia Sigstedt, and it removes errata.

19 HEARING OFFICER: And have the parties had the
20 chance to review the documents?

21 MR. FLETCHER: We did. I looked through it.
22 I didn't have any issue. Most of it was just
23 switching -- words had been switched and added an "A" in
24 there. She did add a "not" somewhere, but that's okay.
25 We talked about that.

1 HEARING OFFICER: Okay. So based on the
2 represented stipulation, I'll receive the document
3 marked as 837A into the record.

4 (Exhibit 837A received.)

5 MS. PATTERSON: Thank you.

6 HEARING OFFICER: Other corrections?

7 Mr. Thompson.

8 MR. THOMPSON: I believe the parties have
9 stipulated to Exhibit 2 for the Surface Water Coalition.
10 It's information contained in Exhibit 4, but it just has
11 a little additional detail.

12 So I would offer that.

13 HEARING OFFICER: Okay. And based on the
14 represented stipulation, I'll receive Exhibit 2 into the
15 record.

16 (Exhibit 2 received.)

17 HEARING OFFICER: Others?

18 MR. BUDGE: Director. Last night I filed a
19 motion to take official notice of the joint forecast.
20 It was brought to my attention that the document I had
21 attached to my motion is not the actual joint forecast
22 of the Bureau and the Corps of Engineers. I've not been
23 able to obtain what I understand to be the full joint
24 forecast, so I'm going to withdraw that motion at this
25 time.

1 If at some point we're able to locate the full
2 document, then we may refile that motion at a future
3 date.

4 HEARING OFFICER: Okay. Well, it is a
5 document that the agency would typically rely upon, so I
6 don't know that anybody would object as long as there's
7 a disclosure to all of the parties.

8 MR. BUDGE: And I have discussed that with the
9 Surface Water Coalition, and they agree.

10 So I'm just, for the record, withdrawing the
11 motion that was filed yesterday.

12 HEARING OFFICER: Okay. Thank you.

13 Okay. Other cleanup?

14 All right. So let's just talk about
15 post-hearing processes.

16 So as I have stated before, this is an
17 expedited process. I apologize to everybody because of
18 the -- in my opinion -- the urgency of holding this
19 hearing, and as a result, I will allow some briefing,
20 but I think it needs to come in within a week. I know
21 that's probably a deadline that nobody likes, so I'll
22 allow simultaneous briefs to be filed. No responses or
23 replies.

24 So let's anticipate any briefs coming in by
25 the close of business a week from today, which would be

1 nine plus -- is what, the 16th? Is that correct?

2 MR. BRICKER: Yes.

3 HEARING OFFICER: Well, let's talk a little
4 bit about some of what I'm concerned about in the
5 briefing.

6 And I've listened to four days of testimony
7 from many witnesses, and I appreciate the participation
8 of the attorneys. And I have respect for both the water
9 bar and for the experts who work on these matters.

10 I want to answer the question that Mr. Budge
11 asked of Mr. Anders and just say that there was much
12 presented today that needs to be considered in the
13 future as we refine the methodology order. It is a
14 dynamic document. It's intended to be. And, honestly,
15 that was the reason for reissuance.

16 So let's talk about some of that information
17 that was presented and the context of that information
18 in terms of the law and the delivery call as, at least,
19 I remember it.

20 So people can correct me either here today or
21 in the briefing. But my understanding in this delivery
22 call is that there's been a determination of material
23 injury already. And there's been a determination that
24 pumping of the groundwater depletes flows in the
25 Snake River, and those flows are flows that the Surface

1 Water Coalition depends upon for its water supply.

2 And it's also my understanding that the courts
3 have said that at least there's a presumption that the
4 senior water right holders are entitled to their water
5 as described in the decrees that have been issued by the
6 Snake River Basin Adjudication court. And so there's a
7 presumption in favor of the senior water right holder
8 that they're entitled to the quantities and the other
9 elements that are in the water right.

10 And, from my perspective, the methodology
11 order is an attempt to evaluate the actual use of water
12 by the seniors to determine whether there is some
13 adjustment that is appropriate from the decreed amounts.
14 And that's the reason for the clear and convincing
15 standard that's been imposed and that the Department has
16 been told by the courts it needs to -- for any
17 adjustment that that's the standard or the proof that
18 needs to come to the Department. And that's the reason
19 for safety factors built into the methodology order.

20 And so much of what I've listened to,
21 honestly, is testimony about uncertainties in that
22 process. And if there are uncertainties in determining
23 by clear and convincing evidence that there's an
24 adjustment that's appropriate, then I want to know what
25 the fallback is legally.

1 Because, frankly, the presumption is that the
2 senior is entitled to the elements of the water right.
3 And if those adjustments are to be established by clear
4 and convincing evidence and the evidence that comes in
5 during the hearing establishes uncertainties about
6 whether it's clear and convincing, then I want to know
7 what the Department's fallback position is.

8 Is the position that we -- there's a
9 determination of material injury, but there's so much
10 uncertainty that the Department should not be
11 administering the water rights? Is the question that
12 there is so much model uncertainty that there is no
13 determination of what a curtailment date should be.

14 And then I think -- associated with that, I
15 think there's also a question about burdens of proof.
16 In other words, in the conjunctive -- and I don't know
17 the answer to this, necessarily, but under the
18 conjunctive management rules, who bears the burden of
19 establishing, by clear and convincing evidence, what
20 those adjustments should be? Is it the Department's
21 burden? Is it the senior burden? Or is it the junior
22 burden?

23 And, honestly, who has that information? I
24 mean, there was an attempt, I think, through the
25 questions to say that the senior has total control over

1 determining whether there's supplemental groundwater use
2 or not. And yet the groundwater diversions are
3 diversions that are measured by the groundwater users
4 and at least reported on an annual basis and reported
5 long after the season is over.

6 So I guess my question is: Who bears that
7 burden? I don't know the answer to that question, but
8 it seems to me it has some relevance in what we're
9 talking about.

10 So I think we need to be thinking rather than
11 trying to look at all of the nuances and all of the
12 deficiencies. I think we need to look at it in the
13 framework of what have the courts told us and what are
14 the standards that need to be applied in looking at how
15 the methodology operates within the larger realm of
16 water administration and conjunctive water
17 administration?

18 Now, there's one other matter I just want to
19 talk about, and I suspect that we will -- there will be
20 arguments about due process and the fact that people
21 didn't have enough time to prepare. And, you know, I
22 think there are questions about whether there were any
23 property interests that were injured prior to this
24 hearing or the people that were deprived in some way in
25 a property interest. Certainly, that harbinger of that

1 possibility is out there.

2 But I think the real question is, what do we
3 do in terms of water administration and timely water
4 administration and try to figure out what's adequate.

5 I'll also point out that there was a theme, I
6 think, through the discussions about the inability to
7 prepare. And I guess I feel a little bit -- you know, I
8 don't know how to characterize this, but, you know, we
9 have been involved in this dispute for 20 years now --
10 or going on 18, I'd say. And there have been
11 opportunities for people to develop mitigation plans;
12 there have been opportunities for people to gather data;
13 there have been opportunities for folks to take on
14 responsibility to prepare.

15 And I find I'm a little incredulous that
16 people will come into the hearing and say, "We haven't
17 had an opportunity to get ready." And I guess I just
18 turn around and say, "Doggone it, there have been years
19 of opportunity to prepare."

20 Now, maybe not for a change from steady state
21 to transient, and, certainly, that's an issue that can
22 be taken to the courts or I need to reconsider; I don't
23 know. But to say that there hasn't been an opportunity
24 to put in place safeguards for the possibility of water
25 administration, I'm a little incredulous at that.

1 All right. I don't know whether there are
2 other issues. You're certainly welcome to raise them.

3 Mr. Thompson.

4 MR. THOMPSON: A page limit, maybe, for
5 post-hearing briefs for Mr. Harris.

6 MR. HARRIS: Mr. Thompson just referred to me,
7 that that's the only reason for a page limit.

8 HEARING OFFICER: Did he suggest a number?

9 MR. HARRIS: No, he suggested he needed it
10 because of me.

11 HEARING OFFICER: Because of you?

12 MR. HARRIS: Because of me.

13 HEARING OFFICER: I'm -- I won't impose a page
14 limit, but you know what, if -- just think about the
15 number of those briefs that I might receive and how
16 quickly I need to get through them. So I would suggest
17 brevity.

18 And one of the reasons that I wanted to talk
19 about issues was to try to get you to focus and maybe
20 not spend so much time arguing about this little nuance
21 or that little nuance in the expert reports, because I
22 think there's a larger framework we really need to be
23 thinking about. And I, hopefully, at least, made a
24 crude attempt at trying to identify a framework.

25 All right. Anything else?

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

Thanks, everybody, for your help --

MR. BRICKER: Thank you.

HEARING OFFICER: -- and your patience.

We'll close the record.

(Hearing concluded at 3:36 p.m.)

REPORTER'S CERTIFICATE

I, ANDREA L. CHECK, CSR No. 748, Certified Shorthand Reporter, certify;

That the foregoing proceedings were taken before me at the time and place therein set forth, at which time the witness was put under oath;

That the testimony and all objections made were recorded stenographically by me and transcribed by me or under my direction;

That the foregoing is a true and correct record of all testimony given, to the best of my ability;

I further certify that I am not a relative or employee of any attorney or party, nor am I financially interested in the action.

IN WITNESS WHEREOF, I set my hand and seal this 13th day of June, 2023.

Andrea Check

ANDREA L. CHECK, CSR No. 748, RPR, CRR

Notary Public

P.O. Box 2636

Boise, Idaho 83701-2636

My Commission expires July 20, 2028.

*	45:14	across (1) 47:6	79:4;204:16,17;205:3,4,25
	accuracy (2) 84:18;105:6	actual (20) 42:15;51:10,23,24;72:20, 25;82:21;84:4;109:15; 111:14;124:11;127:8; 144:22;145:1;172:19; 188:23;190:8,24;199:21; 202:11	administrative (1) 27:11
*** (36) 7:16,17,18,19,20,22,23,24, 25;8:5,6,7,8,9,11,12,13,14, 15,17,18,19,20;9:5,6,7,8,9, 10,11,12,13,14,15,16,17	accurate (14) 13:17;51:19;53:15;63:16; 64:17;65:7,15;84:15,15; 105:2;109:9,11;124:8; 196:16	actuality (1) 174:9	admission (14) 13:12,14,19;28:5,8;56:8; 98:19;101:22;125:7,19; 184:14;185:10;195:25; 198:13
/	accurately (3) 15:16;28:25;155:18	actually (23) 51:18;63:21;71:14;73:1,2; 74:15;75:24;101:7;110:22; 112:4;113:23;124:2;134:10; 137:8,16,19;138:12;157:19; 159:24;176:4;192:16; 193:25;198:9	admit (2) 55:21;196:20
/// (7) 125:25;185:23,24,25; 189:23,24,25	achieve (1) 131:22	adapt (1) 138:2	admitted (6) 101:19;172:3;184:7; 195:17;196:12,24
[achieved (1) 129:17	add (2) 189:12;198:24	admitting (1) 124:24
[As (1) 58:20 [unintelligible] (2) 52:13;184:19	acknowledging (1) 19:13	added (5) 40:14;92:23;98:23;99:6; 198:23	adopt (2) 76:14;105:7
A	acknowledgment (1) 19:5	address (4) 16:15;21:8;166:25;168:6	advertised (1) 22:6
A&B (4) 25:1;160:6,9,20	acre (13) 41:21;52:5;80:13;111:9; 135:18;190:5,10,12,24; 191:14,18;192:6;193:9	addressed (2) 55:24;56:4	advice (1) 58:3
abbreviated (1) 112:16	acreage (28) 38:24;42:15;53:21,21; 58:19;63:15,20;64:18;66:12; 67:10;68:21;76:12;84:4,8, 15;85:2,8,12;93:6,16; 106:15;107:18;109:9; 132:23;133:24;134:15; 158:20;189:2	addresses (1) 43:10	advised (1) 23:25
Aberdeen-Springfield (1) 139:6	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	additionally (2) 174:21,22	advocating (2) 163:10;164:5
ability (1) 154:9	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	address (4) 16:15;21:8;166:25;168:6	aerial (13) 39:6;40:7;58:21;59:19,23; 61:5;79:17;149:2,11,14,15; 150:4;186:22
able (17) 10:15;20:9,12,25;32:6; 46:13,24;64:4;67:8;88:15; 103:9;117:17;167:6,8;187:9; 199:23;200:1	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	addresses (1) 43:10	affairs (1) 27:16
above (7) 44:22;55:7;94:12;95:7; 97:15;115:22;160:3	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	adequate (3) 70:2;191:17;205:4	affect (7) 45:4;46:16;50:15;90:25; 106:24;124:7,9
above-average (1) 177:10	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	adequately (1) 11:1	AFRD2 (9) 173:3,11;174:15,16;179:2; 180:14,24;181:4;185:6
Absolutely (3) 35:19;102:15;158:11	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	adjudication (7) 78:11,16;79:14;139:25; 186:21;187:4;202:6	AFRD2's (1) 174:7
accepted (5) 17:23;18:17,20;19:2,6	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	adjust (2) 178:24,25	afternoon (6) 102:8;126:3,4;132:12; 147:14;171:11
accepting (1) 169:5	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	adjusted (9) 43:13;45:11;47:3;114:10; 145:11;173:11;179:2,5,18	ag (2) 71:8;149:20
access (3) 81:20;82:10,14	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	adjusting (1) 173:20	again (40) 10:20;39:25;41:2,11;45:7; 47:25;48:13;51:4,9,23; 52:15;53:25;54:6;55:11,13; 61:18;64:4;66:16;73:19; 79:16;82:18;90:7;96:25; 107:4;110:23;111:17,21; 121:4;128:14;134:6;138:16; 139:1;158:13;168:21,23; 172:14;175:11;176:8;184:8, 23
accommodating (1) 140:21	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	adjustment (7) 107:9;173:23;174:2; 175:5;202:13,17,24	against (1) 144:14
accommodation (1) 102:3	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	adjustments (15) 43:25;44:5;51:8,14;54:5; 92:7;97:5;133:21;173:24; 174:2;175:12,18;181:22; 203:3,20	agency (1) 200:5
According (1) 106:15	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	administering (1) 203:11	ago (5) 15:2;78:18;79:16;96:13; 108:23
account (12) 49:6;50:7;53:3;61:10; 76:2;80:10;91:6,14;92:7,23; 116:20;128:2	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5	administration (6)	agree (49)
accounted (2) 173:7;174:25	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5		
accounts (1)	acres (112) 37:14,15,15;38:25;39:3,3; 40:10;45:10;50:15,24,25; 51:2,3,5,11,22;52:1;53:23; 54:8;58:15;62:1;66:6,19,23; 67:1;70:12,24;71:19;74:20; 76:4,6;78:15,22;79:14; 80:18;81:22;97:8;105:13,15; 106:6,14,17,20,23;107:4,14, 20;108:7,11;109:15,18,25; 110:13,16,24,25;111:4,15; 120:25;121:23;124:4,12; 133:9,11,12,23;134:10,20; 140:1;143:8,9;148:1,12; 149:7,21;155:16,19,21; 159:15,21,25;160:13,15; 162:7,16,20,21;163:21,22; 164:2,6,15;186:15,19; 187:20;188:12,13,18,24,25; 189:1,13;190:9,15;191:19; 192:12,17,20,24;193:22; 194:2,5		

<p>13:17;50:14;63:14,19; 64:12,14;67:7;69:5;72:2; 74:15;75:19,22;76:3;82:12; 84:11,14,18;87:2;90:5;95:3; 100:10,23;101:13;104:4; 105:14,23;106:19;107:24; 109:5,18;120:11,20;129:24; 130:2,12;137:7,13,14; 154:16;158:5,6;161:23; 180:8;188:9;193:1,4,7,10; 200:9</p> <p>agreed (1) 13:11</p> <p>agreement (2) 65:22;168:13</p> <p>agreements (1) 169:1</p> <p>agricultural (5) 42:12,23;72:17,21;104:25</p> <p>AgriMet (2) 143:10;145:25</p> <p>ahead (8) 42:4;65:13;79:11;106:13; 157:9;158:1;193:15,16</p> <p>air (1) 165:5</p> <p>al (1) 25:2</p> <p>Alan (2) 165:11,13</p> <p>albeit (1) 120:7</p> <p>alfalfa (9) 145:7,14,21,25;146:5; 159:14,20,25;162:20</p> <p>algorithm (2) 104:5;127:11</p> <p>allegation (2) 173:14;175:8</p> <p>allow (8) 10:20;29:21;46:11;73:7; 79:9;160:10;200:19,22</p> <p>allowance (1) 100:4</p> <p>allowed (4) 10:19;17:23;23:18;168:2</p> <p>allowing (1) 10:14</p> <p>almost (5) 53:17;127:7,15;174:23; 195:6</p> <p>along (5) 22:24;149:4;159:15; 166:22;185:8</p> <p>alternative (1) 18:6</p> <p>alternatives (1) 17:7</p> <p>always (9) 46:7;47:12,16;53:7;127:7, 15,25;169:5;182:11</p> <p>AMALGAMATED (15) 8:16;26:13,20;27:14,21;</p>	<p>28:4,14;29:22,24;30:25; 31:7,12;32:1,12,20</p> <p>Amalgamated's (3) 29:7;30:14;31:13</p> <p>ambiguous (1) 181:15</p> <p>amend (1) 108:14</p> <p>Amended (1) 21:9</p> <p>amendment (1) 168:19</p> <p>amendments (2) 167:11;168:14</p> <p>amount (15) 45:22;49:13;52:6;72:2,16; 88:1,4;90:3,9,16,19;92:20; 110:21;128:9;188:24</p> <p>amounts (2) 66:14;202:13</p> <p>analyses (1) 108:17</p> <p>analysis (39) 16:14;39:15;43:11,19; 44:11,13,16;55:1;58:5; 64:17;65:21;79:18;80:17; 81:4;82:20,23;83:2;85:12; 95:20,21,24;96:1,3;108:21; 112:10,20,23;114:16; 121:20;135:22;136:16,21; 143:2;151:20;153:14,23; 154:8;176:16;178:23</p> <p>analyze (3) 81:1;82:14;154:24</p> <p>analyzed (1) 80:18</p> <p>analyzing (2) 91:6;104:25</p> <p>ANDERS (11) 7:4;166:8;170:14,16,22, 23;171:3,15;183:8,13; 201:11</p> <p>Anders' (1) 54:17</p> <p>A-n-d-e-r-s (1) 171:15</p> <p>Anderson (24) 123:19,20,23;124:1,17; 140:9,11,13;165:14,17,20, 21,24;166:4,9,21;167:3; 168:6,7,8,17;169:4,9;170:6</p> <p>Andrea (6) 11:4,7;57:9;71:2;123:16; 195:13</p> <p>announced (1) 20:12</p> <p>annual (5) 43:12;55:3;131:9;176:17; 204:4</p> <p>annually (2) 85:1;131:4</p> <p>answered (2) 100:19;160:21</p>	<p>anticipate (1) 200:24</p> <p>apologies (1) 121:2</p> <p>apologize (5) 14:7;44:2;67:18;82:18; 200:17</p> <p>apparently (4) 11:15;12:3;38:12,13</p> <p>appear (10) 60:1;61:16,18,19;64:8; 95:3,4;99:8;101:15;190:19</p> <p>appeared (1) 149:8</p> <p>appears (3) 34:9;114:6;115:3</p> <p>apples (1) 159:19</p> <p>application (3) 53:10;105:16,24</p> <p>applied (3) 89:2;140:5;204:14</p> <p>Apply (2) 104:14,19</p> <p>Appreciate (9) 33:23;77:14;78:8;79:23; 110:19;140:21;181:24; 194:20;201:7</p> <p>approach (4) 23:4;55:18;64:1,2</p> <p>appropriate (7) 41:13;77:19;104:6; 165:24;166:10;202:13,24</p> <p>appropriately (2) 157:13;164:15</p> <p>approved (5) 19:22;22:1,4;30:19;33:17</p> <p>approximately (3) 111:11;151:14;192:20</p> <p>April (5) 17:11;21:10;49:13;50:3; 182:3</p> <p>Aquifer (5) 15:8;16:25;27:23;29:5; 90:20</p> <p>ArcMap (3) 37:24;108:21;118:4</p> <p>area (43) 36:23;39:2,13;42:15; 50:21;52:21,23;60:4,6,23; 61:11;62:9;70:12;74:24; 79:9;80:6;84:1,3,6;86:20; 93:13;101:6;108:2;109:10; 117:22;118:22;121:1,10,17; 133:19;150:6;151:12;152:3, 12;153:2,5,16;160:5;163:9, 11;187:6;188:17;191:10</p> <p>areas (29) 37:8;38:15;41:4;42:5,6; 48:22;52:20;59:25;60:8,9; 64:10,15;81:1;99:7;100:7, 13,17,20;101:13;109:6; 118:6;137:4;139:15,22;</p>	<p>140:6;149:4;152:20;154:12, 16</p> <p>arguing (2) 110:11;206:20</p> <p>argument (2) 107:12,13</p> <p>arguments (2) 109:24;204:20</p> <p>arise (1) 10:22</p> <p>around (8) 15:2;38:15;42:7;71:9; 100:16;115:18;152:20; 205:18</p> <p>arrive (1) 116:8</p> <p>arrived (2) 10:4;131:13</p> <p>art (1) 130:11</p> <p>artificial (2) 105:15,24</p> <p>As-Applied (4) 21:10;36:17,21;142:15</p> <p>aspect (1) 180:19</p> <p>assess (2) 43:17;53:14</p> <p>assessment (1) 53:15</p> <p>assigned (1) 188:12</p> <p>assigning (1) 178:20</p> <p>assist (3) 17:12;33:5;78:9</p> <p>associated (3) 75:11;118:25;203:14</p> <p>assume (12) 26:6;74:8;76:4;83:9; 90:14;97:21;99:18;107:2; 123:8;184:4;185:15;194:11</p> <p>assumes (3) 80:13;97:1;115:15</p> <p>assuming (1) 114:10</p> <p>assumption (3) 122:24;151:25;190:18</p> <p>assumptions (1) 115:22</p> <p>attached (3) 36:4;141:24;199:21</p> <p>attainable (1) 191:2</p> <p>attempt (5) 168:2;169:23;202:11; 203:24;206:24</p> <p>attempted (1) 25:9</p> <p>attention (4) 40:16;83:22;181:8;199:20</p> <p>attorney (4) 76:16;98:21;158:14,15</p>
--	---	---	--

attorneys (1) 201:8	7,8;113:7;123:12,14;125:17; 132:13;134:1;135:21;	187:3	blue (8) 39:2;60:15;62:15;150:14, 21,25;151:16;172:9
attorney's (1) 137:11	144:25;149:24;158:9; 161:14;175:14,18;176:24, 24;177:4;180:7;182:25;	bears (2) 203:18;204:6	BLY (2) 112:16;126:17
attributable (1) 190:15	183:24;186:9;190:21;195:5, 8,10	become (3) 32:13;128:13;144:21	board (1) 58:3
attribute (1) 118:24	backdoor (1) 168:2	becomes (4) 93:1;97:20;189:8,8	bold (1) 22:23
audible (1) 71:2	background (2) 14:18;166:12	beds (1) 46:3	BONNEVILLE-JEFFERSON (2) 8:4;186:2
audibly (1) 34:25	backwards (1) 91:23	beet (2) 27:19,23	book (2) 12:19;13:3
audio (1) 35:15	bad (1) 164:3	beets (1) 71:25	booster (1) 53:10
augmented (1) 48:24	balance (2) 31:20;32:7	began (3) 48:20,20;112:20	both (8) 64:5;77:5;81:15;145:13; 149:1;158:13;167:12;201:8
August (1) 86:25	balances (1) 32:5	begin (3) 16:22;99:11;124:22	bottom (12) 60:4;68:18;76:8,11;77:1; 88:1,5;95:6;121:5;157:24; 159:11,12
authorized (2) 23:23;74:19	ballpark (1) 116:7	Beginning (3) 23:15;50:18;55:16	bought (2) 162:1,2
authors (3) 103:5,7,10	banks (2) 41:19;91:2	begins (2) 42:1;112:10	boundary (2) 18:18;149:4
automatically (2) 49:8;52:6	bar (1) 201:9	behalf (2) 14:13;102:12	box (1) 99:13
automation (1) 87:11	barley (3) 86:21,24;146:2	behind (1) 142:18	boy (1) 141:19
available (21) 82:20;104:11,15,19;105:1; 109:5,14;119:11;120:14; 121:16;143:19;144:21,23, 24;164:20,21;165:1;166:24; 167:7;191:2;197:7	Barlogi (10) 46:6;69:21;86:15;87:6; 89:18;135:2;145:18;153:21; 162:19;188:6	bell-shaped (1) 172:7	brain (1) 140:5
average (26) 44:23;55:7;94:9,12,21; 97:15,17,20;113:23;114:2, 25;116:13,14;122:12,18; 131:8;143:20,24;144:14,18; 146:1;156:16,19;157:4; 177:9;178:1	Barlogi's (4) 78:13;88:22;115:24; 157:10	below (5) 44:23;94:13;113:23; 139:12;159:14	Break (8) 34:7;57:3,5,7;123:11,13; 195:5,9
averaged (3) 143:21;144:11,17	base (1) 122:21	beneficial (1) 106:16	brevity (1) 206:17
averages (1) 113:22	based (33) 18:13;28:7;29:14;33:3,16; 37:11;54:2,9;55:5;58:21; 76:24;88:22;97:8;104:10; 107:5;111:10,12,18;114:5, 20;115:22;127:14;139:19; 161:23;173:23;175:16; 179:9,15;180:17;185:1; 197:10;199:1,13	benefit (4) 63:17;67:8;155:16,21	Bricker (16) 11:2,3;123:10;124:21,22; 125:2,5,8,23;126:2,5;132:6; 140:14,16;201:2;207:2
avoid (2) 18:8;66:15	baseline (33) 36:23;51:21;54:14,16; 93:10;97:7,10,12,14,18,21; 107:25;110:13,15;112:15; 122:9,13,25;126:8,22; 130:18,21,25;133:22; 174:16;175:15,20,24;176:12, 19,20;177:25;178:10	besides (2) 68:6;147:17	brief (3) 14:18;54:15,22
awaiting (1) 30:7	basically (1) 110:9	best (15) 18:6;104:10,15,19;109:5, 13;120:14;154:23;164:18, 20,21;165:1;191:2;192:13, 15	briefing (3) 200:19;201:5,21
aware (16) 16:24;25:12,25;26:3;29:4; 32:13;43:2;63:22;68:7; 69:22;84:25;86:7;89:20; 99:18;101:5;169:17	Basin (5) 78:11;139:25;186:21; 187:4;202:6	better (10) 35:9;59:22;84:19;88:12; 90:15;142:12;161:9;163:4,5; 170:19	briefs (4) 200:22,24;206:5,15
away (1) 49:24	basis (4) 72:17;93:10;124:10;204:4	beyond (3) 50:8;79:2,7	bright (2) 128:14,15
B	Baxter (1) 19:12	Bias (1) 176:12	bring (4) 10:16;108:24;169:16; 187:9
back (49) 15:4;16:25;17:10;29:5,8; 31:8;32:15;34:8,9;40:14; 41:25;47:25;56:21;57:5; 64:19;66:16;68:17;79:24; 89:19;93:22;94:20,25;107:1,	Bear (1)	BID (1) 179:2	bringing (1) 160:15
		big (5) 46:5,15;49:10,10;111:3	broad (3) 82:16,19;104:21
		binder (1) 28:22	Brockway (43) 10:11;34:3,10,15,19;35:1, 17,23;36:1,16;44:3;52:14; 55:23;56:2,3,6;57:10;66:20;
		bit (12) 14:23;35:15;37:21;54:2; 58:3;64:4;67:4;71:9;83:7; 167:4;201:4;205:7	
		black-and-white (1) 149:20	
		blanket (1) 96:24	

<p>82:17;99:25;102:8;103:13; 123:24;126:3;140:18; 148:15;151:5;152:6;157:18; 158:5,6,12;159:6;163:16,17; 170:11;186:12;187:17; 188:5;189:3;191:11,22; 192:18 B-r-o-c-k-w-a-y (1) 35:24 broken (1) 36:25 Bromley (8) 17:18;125:10;156:4,5,8, 10;162:14;165:2 Bromley's (1) 162:13 brought (3) 19:15;181:7;199:20 brush (1) 64:1 BRYCE (6) 7:8;170:10;171:24; 183:24;186:1,9 Budge (48) 7:6;57:13,14,17;67:7,18; 70:16,21,23;71:6;76:24; 77:9,10,19,22,23;79:11,12; 82:25;86:7;96:6;97:23;98:5, 10,18,21;100:6;101:16,19; 102:2;113:3;132:23;135:8; 136:12,24;138:10;147:10,13, 20,24;155:24;180:2,5; 182:24;183:5;199:18;200:8; 201:10 Budge's (1) 137:12 budget (1) 186:25 buffer (1) 118:6 buffering (1) 46:11 bugaboos (1) 95:19 buildings (1) 152:20 built (2) 127:10;202:19 bulk (1) 86:17 burden (5) 203:18,21,21,22;204:7 burdens (1) 203:15 Bureau (1) 199:22 Burley (7) 15:8,17,18,21;20:7;22:20; 24:9 business (1) 200:25 buy (1) 73:7</p>	<p style="text-align: center;">C</p> <p>calculate (15) 51:4,7;54:4;66:7;67:2; 84:8;97:2,4;103:24;109:6; 112:7;114:25;133:20;134:3; 144:19 calculated (18) 43:16;50:22;75:23;78:6; 88:10;91:9;107:5,7;115:21; 116:9;119:25;131:16; 132:24;133:17;134:6;143:5; 144:13;157:13 calculates (2) 91:15;178:10 calculating (5) 81:22;108:10;109:9; 164:14;177:22 calculation (24) 66:9;67:6;75:23,24;76:1; 92:2;93:10;106:21;111:18; 115:11;122:22;129:13,21; 133:15;134:7,12,17,21; 173:6;177:21;178:4,4;190:8; 192:1 calculations (6) 79:21;111:7,11;120:1; 158:18;186:15 calculator (4) 144:7;173:18;181:6,15 call (29) 12:8;16:16;21:9;22:16,18; 25:12;26:14;34:2;37:14; 40:17;60:24;69:14;83:6; 99:14;102:14;132:2;140:25; 161:11;165:13,15;170:10, 14;174:1;181:6;183:24; 191:4;194:17;201:18,22 called (10) 12:13;26:20;34:1,20; 89:15;141:5;143:11;165:19; 171:4;186:2 calling (1) 12:3 calls (2) 144:7;161:6 came (4) 167:24;168:21;176:4; 187:16 can (119) 11:20;12:18;18:22,24; 20:21;21:2,6,11,19,23,25; 22:4,9,10,14;23:4,13;32:9; 34:16;35:6,7,11,16,21;36:13, 18;37:18,20;38:18,22;39:23; 41:1;43:9;44:13;46:20; 48:12;50:19;52:14;55:1,1; 59:10,20;60:20,21,25;66:24; 71:3;75:16;77:19;82:17; 85:23;89:4;93:23;94:16; 96:24;98:16,18;100:6,10; 102:9,9,11;105:3;107:20;</p>	<p>109:11;110:4;113:23; 114:17;117:1;118:6;122:20; 125:14;128:9;129:16,19,24; 132:3,14,22;133:3;134:19; 137:8;139:16,20,22;142:8, 12,23;145:5;148:24;157:3; 158:9;159:2;164:11,12; 166:25;167:3,17;171:13,16; 172:2,10,22;173:1;174:20; 176:8,14,21;177:1,14,19; 178:7,12,17;184:23;195:6; 198:1;201:20;205:21 Canal (142) 37:8;38:6;39:1;41:16; 42:13;43:12;44:20;45:4,5,6, 23;46:2,3,20;47:7,9,22,24; 48:4,19;49:6,10,22;50:8,11, 15;52:21,22;57:22;58:22; 60:3;61:3,25;62:4,9;65:8; 66:4,8,11,15;67:8,13;68:10, 21;69:2;70:1,12;72:15;73:5, 6,12;78:10;79:15;80:6,19; 81:8,13,16,20;82:6;83:1,4; 85:24;87:16,17,24;88:1,4,5, 8,11,14,20;89:6,19;91:1; 92:1,5,6;93:1;94:3;99:9; 100:14,15;105:13;110:24; 112:1;113:19;114:14; 115:16;116:1,4;117:5,15; 118:22;121:1;122:10,16; 129:22;130:17;131:2,21; 135:3,11,15,23;138:25; 139:7,8,9;145:8,11,18;146:9, 13,16;148:19;150:5;153:1; 155:3,6,16;157:12,19; 158:16;159:6,16,21;161:1,2, 9;163:10,12,19,21;174:25; 176:17;179:2;180:14; 181:21;190:12;193:5 canals (7) 39:21;49:14,17;135:4; 138:20,21;139:3 Candice (1) 14:13 canyon (2) 89:23;139:12 capable (3) 76:4;153:8,11 capture (3) 44:22;49:3;112:14 cards (1) 83:5 careful (1) 44:12 carefully (1) 149:7 Carryover (13) 176:12,17;177:8,23;178:5, 11,19,25;179:5,6,10,15,18 carve (2) 61:13;153:2 carved (1) 154:4</p>	<p>carves (1) 62:20 case (16) 16:9;68:15;73:13;82:13; 83:12;88:23;105:18;127:12; 137:23;138:23;141:25; 166:10;173:24;174:15; 176:7;179:12 cases (4) 36:11;120:13;138:2;142:6 case-specific (1) 48:18 catch (1) 67:23 categorize (1) 107:13 category (2) 38:14;42:5 cause (7) 12:14;26:21;34:21;141:6; 171:6;182:25;186:4 caused (4) 23:22;181:8;189:6,6 causes (1) 10:21 CDL (3) 143:16;145:8;157:5 cease (1) 130:4 center (4) 41:6;45:21;47:13;151:15 central (1) 153:22 certain (5) 84:23;96:3;105:9;129:15; 183:1 certainly (12) 48:3;55:7;59:10;61:18; 77:16;114:14;129:18; 136:20;181:14;204:25; 205:21;206:2 cetera (1) 71:25 challenges (3) 50:11;146:9,11 chance (5) 57:4;100:20;173:13; 175:7;198:20 change (20) 51:15;92:2,10,15,17;93:3, 4,7,19;96:2;111:12;129:25; 132:1,2;134:6;137:15; 164:12,16;176:2;205:20 changed (1) 66:10 changes (11) 50:14;72:7;111:6;116:23; 130:13;143:3;144:11; 159:14,25;160:5;182:17 characterize (2) 64:3;205:8 charge (1) 49:14</p>
---	---	---	--

CHARLES (2) 34:19;35:23	11:19;200:13	43:13;44:20;45:4,6,18;46:5, 20;47:7,10,22;48:4,19;49:6, 11;50:8;52:21,23;53:1; 57:22,25;58:22;61:4,25; 62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	compute (1) 111:1
C-h-a-r-l-e-s (1) 35:23	76:13,18;77:6,12,15;79:3, 21;111:17;124:25;140:6; 202:14,23;203:3,6,19	20;47:7,10,22;48:4,19;49:6, 11;50:8;52:21,23;53:1; 57:22,25;58:22;61:4,25; 62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	computed (1) 159:24
chart (4) 54:18;113:10,17;178:10	clear (15) 44:7;190:14	11;50:8;52:21,23;53:1; 57:22,25;58:22;61:4,25; 62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	computer (1) 102:16
check (1) 181:24	clients (1) 187:3	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	concern (1) 20:11
checking (1) 114:9	clip (1) 118:5	67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	concerned (1) 201:4
chemicals (1) 162:2	close (4) 102:16;195:2;200:25; 207:4	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	concerning (1) 180:18
chief (1) 166:10	closely (1) 80:16	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	conclude (1) 175:10
chose (2) 55:2;130:21	closer (1) 142:12	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	concluded (2) 174:5;207:6
Chuck (39) 10:11;34:3;35:5,21;38:18; 41:13;44:9;50:18;54:10; 55:15,20;57:18,21;64:6; 65:1,1;67:7,18;71:6;76:16; 77:23;78:8,9;79:12;80:9; 83:21;86:7;88:13;97:25; 98:7,21;99:2;100:17;102:14; 107:12;132:12;134:24; 138:8,16	Co (1) 157:12	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	conclusion (3) 173:16;179:9,14
chunk (1) 101:2	COALITION (32) 7:21;13:22;16:16;21:9; 22:17;23:22;34:1,20;36:5; 52:20;56:25;65:23;66:2; 84:9,23;85:1;91:16;98:15; 103:25;106:20;113:18; 117:9;140:24;141:5;163:9; 184:4,11;189:17;195:22; 199:9;200:9;202:1	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	conclusions (1) 126:14
CIR (2) 143:11;144:13	Coalition's (1) 26:4	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	condition (1) 162:5
circuit (1) 72:12	collaboration (1) 68:4	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	conditions (4) 46:16;51:23;83:25;108:2
circulated (1) 197:25	collaborative (3) 67:25;155:10;182:7	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	confidence (1) 154:13
circumstances (1) 10:22	collected (1) 89:14	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	confirm (2) 100:10;145:17
citations (1) 106:12	collection (1) 84:22	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	confirmed (1) 197:23
cited (2) 131:6;181:2	collective (1) 116:16	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	confounded (1) 134:9
CITIES (4) 7:21;42:9;195:22;198:6	color (1) 152:3	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	confusing (1) 181:22
City (6) 43:5;102:12;126:5; 158:14;195:21,21	column (1) 113:19	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	conjunctive (5) 79:4;161:11;203:16,18; 204:16
City's (1) 166:15	comfortable (1) 59:7	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	connection (1) 85:8
civil (2) 14:20;36:3	coming (6) 22:1;147:23;174:2,3,10; 200:24	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,24;88:20;92:1, 5,13;93:1,7;99:9;105:13; 112:1;113:20;114:14;117:5, 14,15;118:7;119:15;121:23; 122:11,16;131:3,21;135:3, 23;139:8,9;145:8,11;146:16; 149:17;153:1,19;155:3,7,16, 21;157:19;158:17;159:7,16, 21;161:1,1,18;162:15; 163:10,12,19,21;174:25; 176:18;179:3;180:14; 181:21;190:13;193:5	conservatism (2) 127:10,20
claimed (1) 134:18	commensurate (1) 49:8	62:4,9;65:9;66:5,8,12,15; 67:8,14;68:5,10,21;69:1; 70:1;72:15;73:7,8,13;74:13, 21,22,23,25;75:1,6,12,16; 78:10,14;79:15;80:13,19; 81:9,13;82:2,6,15;83:5;85:7, 12,24;87:3,7,	

construct (1) 20:25	76:13,18;77:6,12;202:14, 23;203:4,6,19	11:10;14:23;32:9;37:17, 20;41:1;44:2;52:14;55:25; 66:20,24;67:16;79:3;82:17; 86:4,6;96:1;99:25;123:17; 162:9;184:20;195:12; 196:17;202:6	192:8,9,12,14
consult (1) 85:7	cool (2) 46:17,25	courts (4) 202:2,16;204:13;205:22	currently (6) 14:20;15:18;16:11,12; 141:20;192:2
consultant (5) 15:12;17:3;24:3;59:2; 68:11	cooperation (2) 81:16;83:1	cover (2) 50:12;111:9	curtail (1) 75:15
consultants (6) 58:23;65:19;67:14;68:6; 155:7;181:17	copies (1) 98:22	covered (7) 29:16;30:4,17;73:5;81:1; 109:7;161:19	curtailed (6) 16:4,7;20:1;33:1;75:18,18
consumes (1) 71:23	copy (3) 101:4;144:6;187:10	covers (1) 50:13	curtailing (1) 69:6
consumptive (10) 41:15,19;42:16;45:9;51:5; 64:22;93:13;105:20;133:18; 143:12	cords (2) 11:24;194:25	creating (3) 58:24;67:24;152:15	curtailment (21) 16:16,24;17:10,13;18:8; 19:23;20:12;22:5,15,25; 24:1,6;29:2,4,8;31:5;32:13, 22;66:15;74:8;203:13
contained (4) 166:22;177:19;178:17; 199:10	corn (9) 71:25;145:7,14,21;146:5, 6;159:15,21,25	creek (1) 89:23	curved (1) 41:8
content (1) 168:11	corner (4) 99:13;137:18;190:13,21	criteria (2) 54:21;110:17	cut (1) 140:3
contested (1) 138:2	corners (4) 38:13;100:8,24;101:14	critical (1) 164:13	CV (2) 36:4;141:24
context (3) 72:22;132:23;201:17	corollary (1) 89:5	crop (46) 45:9,17;49:18,21;70:9; 72:2,25;73:22;75:22;87:3; 91:12,20,21;93:12;96:13,22; 97:4;105:25;107:5;116:23; 131:9,16,20;143:8,9,13,15, 16,21;144:10,12,17,18,19; 145:3,22;156:17,19;158:22; 159:25;163:2,5;164:9,12,12, 14	CWN's (1) 157:12
continual (1) 157:11	Corporation (1) 141:21	cropping (2) 157:1;162:1	D
continue (7) 18:2;66:25;122:17,18,21; 128:25;158:19	Corps (1) 199:22	crops (12) 71:24;84:1;86:19;87:2; 105:16;108:3;144:14; 145:23;158:24;159:17; 162:17,23	Dam (1) 139:12
Continued (7) 7:2;8:1;9:1;43:4;93:17; 144:19;157:14	correction (2) 14:8;91:24	cross (1) 158:13	dash (1) 43:19
continues (1) 122:11	corrections (1) 199:6	Cross-Examination (24) 7:6,10,11;24:14,22;26:8; 33:20;57:13,16;98:2;102:6; 123:9,22;126:1;147:9,12; 156:2,7;165:4;180:4;183:7; 189:16;190:1;193:18	data (59) 43:15,17,18,18,21,21;55:4; 63:16;82:5,6,9,14,21;94:22; 95:4,9;96:10;104:11,15,20; 105:1,8;114:20;118:25; 119:8;121:25;135:14; 138:19,25;143:16,16,19; 144:2,21,22,24;145:1,4,8; 149:10;154:15;157:5;163:5; 164:7,10,10,10;174:10; 179:5,7,10,16,18,19;180:13; 191:25;192:11,14;205:12
continuing (2) 15:5;128:21	corrective (1) 33:11	crude (1) 206:24	database (5) 81:5;85:11;119:18;154:18, 21
continuous (1) 47:21	correctly (4) 60:7;94:23;150:24;151:8	culinary (1) 99:22	dataset (25) 37:12;43:24;44:4;54:24; 60:9;62:17,19,24;63:9,24; 64:1,18;65:9,16;77:24;78:1; 96:4;99:12;150:9;151:1,7, 13;163:18;187:2;190:19
CONTOR (11) 7:8;170:10;171:25; 183:24;184:1;186:1;190:3; 193:20;194:19,20,22	corresponded (1) 153:20	current (17) 36:2;44:15;47:8;83:25; 108:1,1;112:14;130:10,11; 144:5;156:21;163:4;164:10;	datasets (1) 64:5
contribute (3) 91:10;103:8;120:18	Corresponding (1) 125:7		date (16) 16:24;17:8,13;18:11; 20:12;25:20,25;26:2;31:11, 14;32:14,22;39:4;95:19; 200:3;203:13
control (3) 20:20;124:14;203:25	corresponds (1) 125:19		dated (1) 22:18
conversations (2) 17:5;184:12	corroborated (1) 61:5		Dates (2) 22:16;26:4
conversion (3) 47:5,12;48:5	counsel (3) 84:22;187:17;194:16		Dave (13)
conversions (2) 128:20,25	count (1) 188:12		
converted (4) 41:5;71:13;72:4;89:9	counted (1) 190:11		
converts (5) 89:1;90:2,6,8,21	counties (2) 119:8;143:22		
convey (1) 49:22	country (2) 60:25;99:15		
conveyance (6) 45:23;50:9;88:11;91:25; 116:16;128:25	County (2) 43:2;143:21		
convincing (9)	countywide (1) 143:20		
	couple (9) 25:4;31:7;53:2;85:14; 94:16;98:22;138:12;187:16, 24		
	course (9) 33:4;45:19;48:18;51:21; 97:7;133:9,22;139:4;154:20		
	COURT (24)		

<p>36:16;59:2,8,22;60:19; 103:14;140:25;141:16; 142:11;147:14,24;156:1; 193:2</p> <p>DAVID (2) 141:4,18</p> <p>D-a-v-i-d (1) 141:18</p> <p>days (8) 23:18;47:1;49:15;79:20; 103:19;108:22;119:12;201:6</p> <p>deadline (9) 17:8;18:6,7;20:15;21:1; 22:7;32:17,19;200:21</p> <p>deadlines (1) 138:1</p> <p>deal (1) 47:22</p> <p>Dean (3) 26:14,19;27:9</p> <p>D-e-a-n (1) 27:9</p> <p>decade (1) 71:10</p> <p>decades (2) 95:5;96:8</p> <p>December (7) 16:25;20:3;22:17;29:5,9; 31:10;32:13</p> <p>decide (2) 17:25;186:22</p> <p>decided (2) 162:22;175:17</p> <p>decimal (1) 132:3</p> <p>decision (1) 113:1</p> <p>decisions (3) 74:8;79:3;162:1</p> <p>decline (1) 87:4</p> <p>declined (1) 93:6</p> <p>declining (1) 128:19</p> <p>decrease (4) 72:3;88:4;90:19;131:23</p> <p>decreased (2) 93:16;112:4</p> <p>decreases (4) 46:18;88:11;90:18,18</p> <p>decreasing (2) 106:15;136:19</p> <p>decree (2) 79:1;155:23</p> <p>decreed (3) 78:22;118:21;202:13</p> <p>decrees (1) 202:5</p> <p>deep (1) 90:20</p> <p>defensible (3) 188:10;189:10,10</p>	<p>deficiencies (1) 204:12</p> <p>define (2) 79:14;129:19</p> <p>defined (2) 45:8;83:15</p> <p>defining (1) 129:12</p> <p>definitely (2) 39:14;188:18</p> <p>definition (6) 84:5;105:17,21;109:21; 129:17;130:9</p> <p>degree (1) 53:15</p> <p>delineation (7) 40:10,11,13,13;41:12; 42:6;58:22</p> <p>deliver (11) 46:8;69:7,7;74:5,14,14,18; 75:12,16;81:17;128:1</p> <p>deliveries (2) 61:4;153:20</p> <p>delivering (1) 66:1</p> <p>delivers (1) 82:3</p> <p>delivery (24) 21:9;22:18;25:12;42:12; 49:23;61:4;75:2;81:21; 82:22;86:8;143:22,24; 146:18,20,21;149:5;153:19; 160:5;161:6,11,20;162:24; 201:18,21</p> <p>Delorey (6) 26:14,15,19;27:5,9,10</p> <p>D-e-l-o-r-e-y (1) 27:9</p> <p>delved (1) 134:11</p> <p>demand (58) 41:16,22;42:14,17,22,24; 45:17;46:12,16,18,22,25; 47:20,21;50:3,22;51:8,14,17, 21;54:4;64:22;66:8;67:6; 72:21,23;75:24;84:8;93:3,8, 19;96:14,15,21;97:5,7; 105:20;107:9;110:15;111:5; 122:14;124:7,13;130:25; 132:4,24;133:15,21;134:4,5, 12,17,21;145:23;158:22; 173:20,21;177:25</p> <p>demands (7) 41:20;44:20;51:1;52:2; 128:3;130:18;159:17</p> <p>demonstrate (2) 66:5;129:21</p> <p>demonstrated (1) 129:8</p> <p>demonstrates (1) 115:12</p> <p>Denied (3) 77:9,20;166:13</p>	<p>deny (1) 77:3</p> <p>Department (48) 18:19;19:1,5;21:8;63:3,14, 19;66:10;67:25;69:5;76:3; 77:24;78:14,21;81:5;82:7; 84:17;85:2;97:13,21;119:19; 122:19;124:11;130:20; 134:10;143:17,21;149:20; 155:9;162:5,7;163:4;166:7; 167:14,15;169:25;171:19; 180:18;181:2,25;183:16; 191:25;197:3,6,7;202:15,18; 203:10</p> <p>Department's (9) 62:16;143:18;150:9; 154:21;156:16,20;181:8; 203:7,20</p> <p>depend (2) 51:22;188:14</p> <p>depending (1) 137:8</p> <p>depends (2) 136:20;202:1</p> <p>depict (1) 39:20</p> <p>depicted (2) 62:1;107:20</p> <p>depicting (4) 40:24;41:3,10,11</p> <p>depiction (1) 64:17</p> <p>depicts (2) 60:7;145:6</p> <p>depletes (1) 201:24</p> <p>deposition (1) 157:10</p> <p>deprived (1) 204:24</p> <p>describe (21) 36:7,13,18;37:6;38:22; 39:10,23;43:9;45:1;50:19; 52:11;54:12;110:11;142:2,8, 23;144:4;145:5;188:15,16, 17</p> <p>described (7) 51:18;67:11;101:13; 103:4;188:5;191:22;202:5</p> <p>describes (3) 43:11;103:23;177:21</p> <p>descriptions (1) 119:2</p> <p>designed (1) 72:13</p> <p>desire (1) 73:23</p> <p>desiring (1) 137:22</p> <p>desk (2) 11:13;98:6</p> <p>detail (2) 167:17;199:11</p>	<p>detailed (2) 58:21;59:18</p> <p>details (1) 25:18</p> <p>detected (1) 44:14</p> <p>determination (9) 68:20;91:8;111:16; 163:21;193:6;201:22,23; 203:9,13</p> <p>determinations (1) 193:3</p> <p>determine (11) 23:20;37:25;43:20;78:21; 122:2;135:11;139:25; 156:17;188:23;190:24; 202:12</p> <p>determined (2) 110:13;127:8</p> <p>determines (1) 22:8</p> <p>determining (6) 53:3;81:22;143:14;193:8; 202:22;204:1</p> <p>develop (9) 17:7;18:4;20:15,23;29:25; 65:19;86:1;148:25;205:11</p> <p>developed (7) 38:15;42:6,9,15;43:3; 67:13;153:1</p> <p>developing (5) 16:15;18:2;20:16;148:22; 171:17</p> <p>development (5) 42:13;49:2;71:7;152:7; 171:20</p> <p>developments (3) 42:19,20;43:1</p> <p>deviation (1) 127:4</p> <p>difference (6) 38:3;60:5;101:2;132:3; 151:4;157:3</p> <p>differences (7) 37:25;38:4,8;39:2;40:4; 156:23;157:1</p> <p>different (17) 16:5;54:25;55:2;76:14; 88:10;103:7,10;104:22; 134:3,10,15;139:16,19; 169:2;172:18;174:11;191:3</p> <p>difficult (2) 116:21;154:16</p> <p>difficulties (1) 10:21</p> <p>Direct (14) 7:5,9;14:11;27:3;35:3; 64:19;66:16;78:7;124:9; 134:16;141:14;160:25; 171:8;186:7</p> <p>direction (1) 155:18</p> <p>directly (7)</p>
--	---	--	--

<p>45:16;91:11,17;92:9,23, 24;93:4</p> <p>Director (42) 10:7;12:24;18:14;22:8; 23:5,17,19,24;27:15;28:1; 34:2;74:8;75:14;76:24; 78:24;84:23;98:5;103:24; 108:7;112:14,20,21;123:3; 124:23;125:11;140:13,20; 141:12;142:10;166:12; 167:23,25;168:1;169:10,25; 170:21;181:13;182:21; 184:3;185:21;197:20;199:18</p> <p>Director's (2) 120:16,22</p> <p>disappear (1) 190:22</p> <p>discharge (1) 89:23</p> <p>disclosed (2) 169:11;170:2</p> <p>disclosure (1) 200:7</p> <p>discrepancies (1) 156:25</p> <p>discrepancy (2) 196:13,15</p> <p>discretionary (3) 97:12;110:16;113:1</p> <p>discuss (5) 10:6;59:8;60:18;80:4; 152:5</p> <p>discussed (8) 17:5;94:1;143:9;148:14; 189:13;195:24;196:24;200:8</p> <p>discusses (2) 21:15;68:25</p> <p>discussing (3) 71:7;135:8;195:3</p> <p>discussion (19) 54:22;56:20;96:12;122:9; 125:16;132:22;135:24; 143:13;160:4;167:22,25; 168:1,5;169:18,18;180:12, 23;188:8;195:14</p> <p>discussions (7) 31:23;33:16;169:21; 175:16;186:14;187:17;205:6</p> <p>displace (1) 98:8</p> <p>dispute (2) 133:11;205:9</p> <p>distinguishing (1) 77:18</p> <p>distort (1) 189:2</p> <p>distributed (2) 11:6,12</p> <p>distribution (2) 55:2,3</p> <p>DISTRICT (32) 8:4;17:19,20,22,23,24; 18:1,5,17;19:2,15,18,21;</p>	<p>25:1;29:15,23;30:6,9,15,18; 31:1,3;33:7,14;43:13;160:6; 173:5;174:3,12,24;175:13; 186:3</p> <p>district's (1) 158:15</p> <p>ditch (3) 41:17,19;75:8</p> <p>ditches (13) 38:10;41:4,6,11;62:20; 64:10,21;69:10,15;89:15,19; 109:18;117:6</p> <p>diversion (47) 41:20;45:11,25;46:20; 47:24;49:7;51:1,6;55:3;72:9, 23;81:6;89:10;91:11,20,21; 92:10,13,15;93:5,9,14,15,18; 97:9;107:3,3;111:5;112:2; 115:16;116:24;118:14,16; 119:3;122:1;126:8;133:10; 135:14,19;136:14;138:19, 25;143:9;145:4,15;173:11; 174:7</p> <p>diversions (50) 23:22;43:12;47:2;51:3,9, 10,24;53:25;54:2;66:18,21; 67:2;94:4,8;95:1;96:15,20; 97:1,10,17;107:6;110:1,14, 25;113:4,18,24;114:14; 119:24;120:8;122:11,15,16; 126:21;130:18,24;131:23; 133:16,19;135:22;145:11; 157:19;158:17,21,25;159:7, 16,21;204:2,3</p> <p>divert (7) 15:7;27:22;50:25;52:7; 74:25;75:2;131:3</p> <p>diverted (4) 41:23;88:3;89:6,8</p> <p>divide (1) 131:16</p> <p>divided (6) 45:10;51:6;93:14;107:6; 133:19;143:8</p> <p>divides (2) 91:19,21</p> <p>document (27) 17:17;18:24;19:9,11;21:4, 6,7,13,15;22:12,22;30:21; 98:6;101:16,22,23;125:5; 169:16,17;172:17,20;181:2; 199:2,20;200:2,5;201:14</p> <p>documented (1) 181:15</p> <p>documents (19) 13:20,25;28:9,9;56:9,10; 167:20,21;168:10,11,23; 170:8;185:17;196:8,20; 197:1,2,12;198:20</p> <p>Doggone (1) 205:18</p> <p>domestic (4) 29:2;99:19,21;100:4</p>	<p>done (16) 28:2;32:1;58:7;65:21; 79:6;81:2;82:20;83:4;87:25; 99:7;101:1;117:23;149:2; 153:24;174:6;195:18</p> <p>dots (1) 94:17</p> <p>double-counting (1) 40:14</p> <p>doubt (1) 63:18</p> <p>down (17) 14:23;32:9;37:21;42:16, 17;48:15;73:1,2;96:23,23; 105:3;110:24;111:2;124:5,5; 172:11,23</p> <p>downstream (2) 48:13;49:4</p> <p>downward (3) 44:18;95:10;112:8</p> <p>Dr (13) 55:23;56:3;157:18;158:5, 6,12;159:6;163:17;188:5; 189:3;191:11,22;192:18</p> <p>draft (1) 182:1</p> <p>drafting (2) 171:22;182:10</p> <p>drain (5) 48:7,10,11,15;49:2</p> <p>drains (2) 89:15,19</p> <p>draw (1) 83:22</p> <p>drawing (1) 59:24</p> <p>dried (2) 69:22;70:2</p> <p>driven (1) 96:15</p> <p>driveways (2) 61:20;74:9</p> <p>drought (1) 136:6</p> <p>dry (1) 46:4</p> <p>due (9) 16:16;52:24;69:19,22; 80:7;85:21;156:25;157:1; 204:20</p> <p>duly (6) 12:13;26:21;34:21;141:6; 171:5;186:3</p> <p>duration (1) 194:21</p> <p>during (14) 22:24;46:2;49:17;72:8; 85:25;86:18;96:12,12;114:7; 144:7,8;186:11;187:16; 203:5</p> <p>Dylan (1) 124:1</p> <p>dynamic (3)</p>	<p>191:4,9;201:14</p> <hr/> <p style="text-align: center;">E</p> <hr/> <p>earlier (10) 10:20;43:23;46:7;85:20; 86:15;88:22;92:19;95:15; 145:18;148:15</p> <p>early (3) 32:15;86:25;95:17</p> <p>Eastern (3) 15:7;27:22;139:6</p> <p>easy (2) 117:2;129:21</p> <p>edges (1) 42:8</p> <p>education (2) 36:8;142:2</p> <p>effect (5) 50:20;53:3;157:20;159:8, 24</p> <p>effectively (1) 182:19</p> <p>effects (3) 10:13;116:22;191:24</p> <p>efficiencies (30) 36:23;49:12;51:4,7,13; 54:3;67:3,3,5;87:7;91:25; 107:5,7,8;128:20,24;129:1, 23,24;132:2;133:17,20; 134:2,3;143:1,2,3,4;157:21; 159:8</p> <p>efficiency (52) 45:4,8,13,19;47:4,13,17; 49:9,19;50:9,11,16;54:1; 88:8,9,19;89:4;90:24;91:1,7, 10,15,92:17,18,23;93:11; 96:13,23;97:3;111:1;115:16, 18;116:4,9,12;117:6,8,18; 124:5,6,14;129:8;131:9,13, 17,22;143:7,15;145:2;146:9; 158:23,25</p> <p>efficient (3) 30:3;47:15;93:1</p> <p>effort (2) 143:6;154:4</p> <p>either (10) 11:15;100:24;116:16; 119:25;149:7;151:16; 152:23;169:15;182:6;201:20</p> <p>element (2) 143:14;164:14</p> <p>elements (2) 202:9;203:2</p> <p>eliminate (1) 87:25</p> <p>else (8) 13:24;39:8;44:8;50:24; 52:9;75:8;189:12;206:25</p> <p>elsewhere (2) 190:16,19</p> <p>email (5) 11:9;19:12,20;98:22;</p>
---	---	--	--

102:24 emailed (2) 83:18;84:21 emails (4) 168:16,17;169:22;170:1 emergency (1) 10:24 employ (1) 108:20 employed (3) 14:20;53:16;66:18 end (15) 11:20;22:22;23:6;46:9; 49:22,23,24;71:13;95:8,19; 106:24;122:14;127:16; 144:22;197:20 ends (3) 46:14;127:21;128:4 enforce (1) 42:23 engineer (3) 14:20;36:3;141:23 Engineering (5) 14:21;15:1;36:1,16;103:13 Engineers (2) 102:21;199:22 engineer's (1) 137:12 enough (9) 46:24;65:10;73:18;77:4; 107:25;112:8,9;128:17; 204:21 enrollment (1) 30:15 ensure (2) 11:17;50:2 enter (1) 129:5 entered (1) 38:8 entire (2) 44:20;73:24 entities (3) 86:8;113:18;121:10 entitled (5) 42:11;176:11;202:4,8; 203:2 entity (1) 106:20 environmental (3) 27:15,16,20 equal (4) 50:25;52:6;130:18;131:18 equals (1) 131:9 equation (6) 42:25;91:19;92:11;93:2; 97:6;107:9 equations (8) 51:19;52:3;54:9;66:17; 93:20;107:2;110:7;111:19 equilibrium (1) 191:5	equivalent (1) 53:21 Erick (2) 36:15;103:13 ERO (2) 36:16;141:21 errata (3) 197:25;198:10,18 error (4) 108:7;174:15;181:12,17 errors (1) 107:17 ESPA (3) 63:5,7,10 ESPAM (1) 187:1 essentially (8) 45:14;47:24;60:15;83:5; 90:4;104:3;109:23;194:2 establish (2) 169:6,15 established (1) 203:3 establishes (1) 203:5 establishing (1) 203:19 estimate (7) 117:2;145:2,7;154:11; 192:11,13,15 estimated (1) 47:8 Estimates (1) 106:14 estimation (1) 191:12 et (12) 25:2;71:25;72:2;73:1; 75:23;76:1;77:24;91:12; 143:11;144:13;156:20,25 evaluate (7) 31:20;32:6,21,23;81:25; 142:15;202:11 evaluating (2) 53:3;63:15 evaluation (11) 24:1;54:21;58:14,15;91:8; 105:12;147:25;148:12; 153:15;187:19;190:9 evaluations (1) 58:2 evaporate (1) 41:17 evapotranspiration (1) 41:18 evapotranspirative (1) 45:17 even (21) 41:21;42:14,21;74:21; 82:13;105:21;116:6,21; 119:3;120:23;128:8,20; 146:6;158:19;164:24;167:1; 168:11;169:5;170:3;177:9;	192:9 event (1) 55:17 everybody (4) 195:6;196:17;200:17; 207:1 everyone (3) 11:13;143:7;166:5 evidence (20) 11:18;14:2;28:10;56:11; 76:13,19;77:6;101:19,25; 124:24;125:21;167:7; 168:12;185:19;196:9; 197:12;202:23;203:4,4,19 evidentiary (1) 169:3 exact (2) 135:9;192:22 exactly (5) 62:25;65:20;134:8,13; 191:14 Examination (15) 7:5,9;14:11;27:3;28:2; 35:3;59:23;124:22;132:20; 141:14;171:8;179:24,25; 186:7;194:18 examine (5) 57:14;64:4;80:15;123:15, 19 example (19) 39:12;40:1;44:14;46:17; 51:11;64:20;71:12;72:11; 86:3;111:8;115:11,15;130:6; 131:12,14;146:5;158:20; 190:13,14 examples (2) 99:10;167:12 except (2) 29:1;99:2 excerpt (3) 60:3;62:8,9 excessive (1) 128:13 exclude (3) 64:14;152:16,19 excluded (20) 60:23;61:16,17,21;64:8, 11,21;150:18;151:20,22; 152:2,4,10,22;153:4;169:2, 20;188:25;190:6,6 excluding (4) 59:25;153:7;189:1,9 excuse (4) 94:20;139:5;146:25; 177:14 excused (1) 10:25 exhibit (92) 11:16;12:19,19,23;13:2,9, 10,13,13,25;14:2,3,5;15:10, 16,23;17:15;18:22;19:7,14; 21:2;22:10;28:22,25;29:17; 30:12,14,20;31:8;36:5,13;	38:19,24;39:7,8,10,12,20,23, 25;40:17;41:8,25;58:10; 60:2;62:12,15;83:17;84:21; 85:16;98:14,16,17;101:17, 20,24;102:1,17,19,21;103:5; 113:12;124:24;125:9,19,21, 22;136:25;137:3;139:15; 141:25;142:9,18;148:4; 166:15;172:4,5,16,19;176:9, 21;177:12;187:10,11; 195:20;196:9;198:11;199:4, 9,10,14,16 EXHIBITS (38) 9:4;11:5,15,17;12:22;13:1, 1;14:9;28:3,4,6,10,11;55:22; 56:9,12;166:14,15,17,20,23; 167:5,12,20;184:6,14; 185:10,18,20;195:3,17,25; 196:10,12,22,22;197:13,17 exist (2) 48:25;118:22 existed (1) 154:6 existing (1) 48:24 exists (1) 95:10 expect (1) 116:3 expedited (1) 200:17 experience (11) 52:24;53:6;78:1,2,7;86:13; 100:5;140:1;146:12;161:23; 162:4 examples (27) 29:12,12;36:10,14;55:23; 56:3,6;58:9;59:12;77:11; 79:24;85:16;93:22;98:22; 99:4;102:20;113:7;142:5; 146:23;147:2,5;148:6;172:3; 180:10;197:24;198:17; 206:21 expertise (2) 154:25;187:6 experts (1) 201:9 explain (8) 27:13;30:14;59:20;85:23; 148:24;167:3;177:19;178:17 explained (4) 124:4,8;189:4;192:18 explanation (1) 50:6 exploration (1) 79:9 explore (1) 181:9 explored (1) 38:4 exposition (1) 45:3 extent (6)
---	--	--	--

<p>13:18;38:3;48:3;82:21; 92:9;154:24 extra (2) 185:6,6 extreme (4) 55:8,14;75:4;126:18 extremely (1) 72:19 eye-balling (1) 113:4</p>	<p>4,19;49:6;52:21,22;57:21; 58:22;60:3;61:3,25;62:4,9; 65:8,18;66:4,8,11,15;67:8, 13;68:10;69:2,7;70:1,12; 71:9;72:15;73:6;78:10; 79:15;80:6,19;81:20;82:5, 25;85:24;86:2;88:19;92:1,5; 93:1;94:3;99:9;102:13; 105:12;110:24;112:1; 113:19;114:14;116:1,4; 117:15;118:22;120:25; 122:10,16;130:17;131:2; 135:3,23;139:9;145:8,11,18, 25;146:16;148:18;149:3; 150:5;153:5;155:3,6,16; 157:12,18;158:16;159:16, 21;161:1;163:10,12,19,21; 176:17;179:2;190:12;195:22</p>	<p>Ferguson (2) 173:18;181:9 few (13) 86:16,20;88:18;90:23; 108:22;113:7;122:12;126:6; 132:2,13;156:5;158:12; 180:9 fewer (1) 50:24 field (12) 39:18;42:12;58:6;61:7; 70:2;81:3;89:2,6,7,9;186:22; 188:20 fields (11) 38:11;39:13;40:21;53:10; 62:21;69:18,19,22;70:5; 146:24;188:1 fieldwork (1) 58:5 fifth (40) 23:6,10;36:17,20;37:9; 45:11;50:1,51:20;58:19; 76:12;83:7,19;102:17; 103:23;104:13;106:8,21; 108:8;109:13;112:13;126:8; 130:19;136:2;171:17,21; 175:25;176:3,4,5,19,22; 177:7,11;178:9,20;179:5,20; 182:1,8;183:1 Figure (25) 43:15;58:20;67:10;76:14; 81:9;93:25;94:14,18,19; 99:3,3,11;101:1,2;145:5; 156:11,24;159:14,19,19; 172:7;176:15,16;177:10; 205:4 farmer (14) 17:12 file (3) 21:20;25:6,9 filed (6) 24:5;37:15;161:10; 199:18;200:11,22 files (5) 37:17,18,19,23,24 filing (1) 23:19 fill (1) 49:14 final (2) 177:1,2 finalization (1) 168:19 Finally (2) 49:10;137:21 find (7) 30:7;170:4;172:2,10,22; 176:14;205:15 fine (5) 35:10;67:22;79:23; 123:25;169:13 finish (1) 188:22</p>	<p>firm (2) 62:5;108:23 first (20) 12:13;15:14;20:17;26:20; 34:20;58:13,18;80:4;140:3; 141:5;144:23;157:8;170:16; 172:11;180:1,12,20;185:2; 186:3;188:1 fit (2) 55:3,4 fits (2) 55:2;110:17 fix (4) 124:13,14;181:18,18 flat (2) 128:19;129:1 Fletcher (32) 7:10;13:18,21;24:15; 56:17;57:1;125:3,9,11,14; 134:22;147:19,22;166:5,25; 167:18,19;184:15,23;185:2, 4,11,14;189:19,21,22;190:2; 193:11;194:13,15;196:1; 198:21 Fletcher's (1) 193:21 flip (5) 68:17;79:25;83:21; 159:18;161:14 flip-flops (1) 12:2 flood (5) 89:1,12;90:2,8,21 flow (3) 48:15,24;72:19 flowing (1) 48:23 flowmeters (1) 119:25 flows (5) 48:7,10;201:24,25,25 flux (1) 182:11 focus (5) 27:16;117:14;183:10,11; 206:19 focused (2) 38:2;143:5 folks (2) 184:5;205:13 follow (2) 46:22;138:17 following (1) 190:20 follows (6) 12:15;26:22;34:22;141:7; 171:6;186:5 follow-up (2) 180:9;193:14 food (2) 21:16,17 FOODS (15) 8:10;12:8,13;14:14;15:4,</p>
F			
<p>face (1) 98:19 facilities (2) 27:19,23 facility (13) 15:8,17,18,21;20:7;22:20; 24:9;27:25;28:14,18,20; 31:21;32:4 fact (9) 106:8;108:19;113:2; 120:3;134:9;164:21;192:13; 195:16;204:20 factor (14) 46:5,15;47:4;48:2;49:5,10; 50:15;126:10,17,23;127:3,6; 135:10;188:10 factors (14) 38:8;45:3;50:7;68:20; 90:25;91:5,10,14;97:5; 107:21;116:20;129:5; 186:15;202:19 factory (2) 13:3;29:1 fair (6) 63:24;70:15;88:16; 110:21;128:17;163:6 fairly (4) 52:24;119:11;192:22,24 faith (2) 169:14;170:2 fall (1) 144:8 fallback (2) 202:25;203:7 falling (1) 196:4 fallow (10) 73:4,16,23;190:5;191:6,7, 8;192:7;193:9,9 fallowed (9) 186:19;188:2,13,21;189:1, 4,8,12;190:13 fallowing (8) 70:6,8,13,24;73:15,21; 186:14;189:6 fallows (2) 191:18,19 FALLS (99) 7:21;37:8;38:6;39:1;43:2, 5,12;44:19;45:5;47:7,9;48:3,</p>	<p>Falls' (3) 71:24;78:22;93:16 familiar (23) 15:6;27:18,21,24;28:13; 59:3,6,11;63:7;77:23;83:11; 87:18;101:5;108:11;118:1,5; 119:17,18;121:2;138:24; 139:2;154:18,20 familiarity (1) 146:12 FAQ (1) 21:7 far (4) 25:20;149:24;166:5; 168:22 farm (10) 47:19;53:6,18;73:16,18, 23,25;89:2;90:12,16 farmer (14) 70:1;73:10,11,15,17,21,23; 90:2,6,8;191:18,21;193:2,8 farmers (2) 81:18;161:24 farmland (3) 72:3;74:24;82:2 farmstead (2) 99:14;100:14 farmsteads (11) 60:24;62:20;99:18;100:9, 24;101:14;152:6,10,18,20; 154:4 fashion (2) 53:12;82:1 favor (1) 202:7 feeds (1) 106:20 feel (1) 205:7 feeling (1) 10:13 feet (3) 12:5;48:22,22 felt (2) 44:18;55:13</p>	<p>Ferguson (2) 173:18;181:9 few (13) 86:16,20;88:18;90:23; 108:22;113:7;122:12;126:6; 132:2,13;156:5;158:12; 180:9 fewer (1) 50:24 field (12) 39:18;42:12;58:6;61:7; 70:2;81:3;89:2,6,7,9;186:22; 188:20 fields (11) 38:11;39:13;40:21;53:10; 62:21;69:18,19,22;70:5; 146:24;188:1 fieldwork (1) 58:5 fifth (40) 23:6,10;36:17,20;37:9; 45:11;50:1,51:20;58:19; 76:12;83:7,19;102:17; 103:23;104:13;106:8,21; 108:8;109:13;112:13;126:8; 130:19;136:2;171:17,21; 175:25;176:3,4,5,19,22; 177:7,11;178:9,20;179:5,20; 182:1,8;183:1 Figure (25) 43:15;58:20;67:10;76:14; 81:9;93:25;94:14,18,19; 99:3,3,11;101:1,2;145:5; 156:11,24;159:14,19,19; 172:7;176:15,16;177:10; 205:4 farmer (14) 17:12 file (3) 21:20;25:6,9 filed (6) 24:5;37:15;161:10; 199:18;200:11,22 files (5) 37:17,18,19,23,24 filing (1) 23:19 fill (1) 49:14 final (2) 177:1,2 finalization (1) 168:19 Finally (2) 49:10;137:21 find (7) 30:7;170:4;172:2,10,22; 176:14;205:15 fine (5) 35:10;67:22;79:23; 123:25;169:13 finish (1) 188:22</p>	<p>firm (2) 62:5;108:23 first (20) 12:13;15:14;20:17;26:20; 34:20;58:13,18;80:4;140:3; 141:5;144:23;157:8;170:16; 172:11;180:1,12,20;185:2; 186:3;188:1 fit (2) 55:3,4 fits (2) 55:2;110:17 fix (4) 124:13,14;181:18,18 flat (2) 128:19;129:1 Fletcher (32) 7:10;13:18,21;24:15; 56:17;57:1;125:3,9,11,14; 134:22;147:19,22;166:5,25; 167:18,19;184:15,23;185:2, 4,11,14;189:19,21,22;190:2; 193:11;194:13,15;196:1; 198:21 Fletcher's (1) 193:21 flip (5) 68:17;79:25;83:21; 159:18;161:14 flip-flops (1) 12:2 flood (5) 89:1,12;90:2,8,21 flow (3) 48:15,24;72:19 flowing (1) 48:23 flowmeters (1) 119:25 flows (5) 48:7,10;201:24,25,25 flux (1) 182:11 focus (5) 27:16;117:14;183:10,11; 206:19 focused (2) 38:2;143:5 folks (2) 184:5;205:13 follow (2) 46:22;138:17 following (1) 190:20 follows (6) 12:15;26:22;34:22;141:7; 171:6;186:5 follow-up (2) 180:9;193:14 food (2) 21:16,17 FOODS (15) 8:10;12:8,13;14:14;15:4,</p>

<p>15,17;18:20;19:1,14,25;20:8,19;24:4;25:9 Foods' (1) 20:16 footer (1) 60:5 footnote (2) 178:7,8 force (1) 72:20 forces (1) 97:18 forecast (8) 55:18;127:3,7,15,20; 199:19,21,24 forget (1) 34:14 forgot (1) 98:7 form (1) 166:18 formerly (1) 74:24 formula (1) 104:3 forth (2) 37:11;93:21 forward (8) 12:10;26:16;57:13; 124:21;141:2;144:2;147:18; 170:23 found (10) 31:4;38:1,7;40:2;43:21; 51:19;172:25;173:19;174:1; 175:21 foundation (4) 70:14,22,25;129:15 foundational (2) 138:17;139:1 four (5) 19:13,22;28:6;164:8;201:6 Fourth (4) 104:7;109:12;114:12; 176:18 fraction (1) 192:17 fractured (1) 133:6 frame (2) 95:22;114:8 frames (1) 114:5 framework (3) 204:13;206:22,24 frankly (2) 84:6;203:1 frequently (1) 61:22 Friday (1) 166:1 fringe (2) 38:15;42:7 fringes (1)</p>	<p>149:16 front (9) 12:21;21:8;28:3,23;106:9; 121:7;152:13;167:2,23 full (8) 34:12;44:19;74:1;157:8, 25;162:24;199:23;200:1 fully (1) 73:5 fun (1) 180:6 function (4) 42:18;118:10;133:22; 182:18 functions (2) 83:15;118:6 further (19) 24:11;33:19;56:22,24; 88:16;97:23;98:2;140:11,14; 147:7;155:24;156:2;165:2; 167:17;179:23;181:9;183:5; 194:10,18 future (6) 122:20;130:4;182:18; 188:20;200:2;201:13</p>	<p>GIS (28) 37:13;59:3,24;60:10,13, 18;61:22;63:24,25;64:7,16; 65:7,19;67:12;79:13;108:12, 21;109:4;118:2;148:18; 150:8,13;151:6,20;152:8,11, 16;153:18 gist (1) 167:16 given (10) 51:2,10;54:1;66:19,22; 82:20;97:2;111:1;133:16; 192:13 glad (1) 12:5 glitch (1) 67:20 goal (3) 55:11;149:21;192:10 goes (11) 47:25;48:15;64:19;66:16; 73:1,1,2;75:8;97:10;107:1; 158:18 Good (30) 14:13;24:24,25;25:3;27:5, 6;35:5,7;57:12,18,20;81:22; 102:8;105:4;124:1;125:23; 126:3,4;129:14;132:12,15, 16;146:20;147:14,15,16; 169:14;170:2;171:11;184:16 goodness (2) 57:23;104:21 gosh (1) 147:22 Gotcha (1) 23:8 governed (1) 74:21 grain (1) 146:6 grains (2) 146:2,4 graph (2) 95:13;96:7 graphs (1) 145:17 grass (2) 71:20,23 gravity (4) 45:20;47:15,21;48:8 gravity-irrigated (1) 41:5 gray (1) 94:11 great (4) 48:3;103:3;113:16;114:12 greater (7) 66:5;97:20;114:23,24; 116:17;117:17;127:7 green (4) 139:20,23;140:4;186:23 Greg (2) 102:20;113:6</p>	<p>Greg's (1) 114:10 GROUND (18) 8:4;29:15,22;30:6,8,15,18, 25;31:3;33:7,13;53:17; 122:5;137:16;162:23;173:5; 175:13;186:3 groundwater (66) 15:7;20:22;22:16;23:22, 23;24:13;27:22;29:12;32:7; 48:20;52:17;53:4,5,16,22; 54:8;61:11;68:5;69:6;75:15; 77:5,11;80:1,5,10,19;81:2,5, 9,23;82:1,10,13,15;85:15,21; 86:2,9;98:3;117:24;118:7, 21;119:15,24;120:8,17,23; 121:11,21;122:1,3,23; 127:13;132:9;153:15;154:9, 24;155:12;158:15;174:24; 179:25;184:5;201:24;204:1, 2,3 group (10) 54:19;132:9;144:6;175:16, 17,24;176:3;196:21;197:4,6 grow (2) 105:16,25 growing (2) 139:21,21 grown (2) 71:24;86:19 guaranteed (1) 182:12 guess (21) 25:22;33:12,16;40:17; 54:11;55:15;58:13;78:25; 135:10;136:16;139:1;146:8; 160:19;170:2,15;183:9; 192:6;194:14;204:6;205:7, 17 guts (2) 51:16;134:12 guys (1) 32:9</p>
G		H	
<p>gallons (1) 72:13 garden (1) 99:23 gardening (1) 100:15 gardens (1) 71:21 Garrick (1) 19:12 gather (1) 205:12 gathering (1) 167:14 gave (6) 105:4;110:22;111:8,9; 115:10;188:8 general (14) 45:3;47:14,18;50:23;58:3; 78:6;117:20;126:25;133:8; 135:17;136:11;139:4; 152:15;186:24 generally (28) 28:16;36:7,13,18;38:22; 43:9;45:1;50:19;52:11; 57:24;80:7;83:14;85:21,25; 88:17;89:3,9,13;130:11; 133:10;138:24;140:2;142:2, 8,21;145:5;153:7,12 generate (2) 60:17;108:14 generated (1) 119:8 generation (1) 107:17</p>	<p>half (2) 71:14;93:17 half-an-acre (1) 100:4 half-pivot (1) 39:17 halfway (4) 23:15;172:11,23;176:14 hand (3) 26:17;34:16;79:20 hands (1) 165:5 happen (10) 19:18;20:6;21:16;31:3,12, 17;71:9;107:17;164:18; 192:15 happened (9)</p>		

<p>17:21;18:18;30:5;47:6; 87:16;97:19;149:6;180:24; 192:16 happening (1) 44:19 happens (3) 72:8;137:16;162:25 harbinger (1) 204:25 hard (5) 53:14;101:4,5;180:8; 181:23 hardened (3) 106:6,17;152:19 Harris (31) 7:11;98:4,9,11;102:4,7,12; 103:3,4;113:13,16;123:3,6; 129:14;136:1;137:21; 138:11,12,15,16;140:7; 142:10;158:13;193:13,14, 19;194:10;206:5,6,9,12 harvested (2) 86:25;87:3 hay (1) 71:25 HDR (3) 14:21;15:1,5 headgate (2) 74:19;75:8 heading (6) 80:3;95:7;147:25;148:3, 10;187:19 heads (1) 194:24 health (1) 70:9 hear (13) 35:6,7;44:3;67:20;88:14; 102:9,11;135:2;142:12; 162:9;184:20,22;196:3 heard (11) 46:6;47:8;63:6,11;70:20; 86:17;145:17;146:11;152:5; 157:11;158:12 HEARING (165) 10:3,9,17,20;11:14;12:3,9, 17;13:15,19,23;14:4,6;15:3; 22:7,8;23:19,25;24:12,18; 26:8,11,15,24;28:7;33:20,24; 34:5,8,24;35:12,16,20;41:2; 56:5,10,13,14,16,19,21,24; 57:2,8,12;68:14;70:18,20; 71:1,5;77:3,16;79:8;98:2,8, 12;101:21,23;102:4;106:14, 16;113:12,14;123:6,8,11,14, 18;124:20;125:1,6,13,17,24; 132:8;138:10;140:9,11,14, 17,22;141:1,9;146:25;147:4, 9;156:2;165:3,8,15,18,23; 166:2,7;167:1,18,23;168:7, 15;169:4,13;170:7,13,18,22; 171:1;172:14,21;179:24; 182:7,14,16,23,25;183:4,6,</p>	<p>15,19,23;184:1,8,10;185:1,9, 12,15;189:16,21;193:12,15; 194:11,14,17;195:4,10,13, 19,23;196:3,6,8,11,25;197:9, 10;198:4,12,15,19;199:1,6, 13,17;200:4,12,19;201:3; 203:5;204:24;205:16;206:8, 11,13;207:3,6 held (4) 56:20;82:5,6;125:16 Hello (1) 171:10 help (2) 182:18;207:1 helping (1) 187:3 herein (1) 129:8 Hey (4) 57:20;65:1;98:5;132:14 Hi (1) 156:9 high (8) 49:16;72:19;87:17;116:6; 127:6;135:7;142:4;192:25 high-efficiency (1) 45:21 higher (9) 42:21;66:7,12;67:4;72:9; 97:18;111:16;122:13,13 highest (1) 55:9 highlighted (6) 54:21;62:14;100:7;101:6; 151:16,23 highlighting (7) 98:23;99:2,7;150:6,15,15, 20 hindcast (2) 176:15,16 hire (1) 33:4 hired (1) 29:11 historic (3) 110:14;113:17;133:17 historical (5) 120:8;134:1;149:3,19; 188:16 historically (1) 134:10 history (3) 36:8;142:3;149:5 hit (1) 42:3 hits (1) 142:4 hold (2) 23:19,25 holder (1) 202:7 holders (3) 55:13;126:11;202:4</p>	<p>holding (1) 200:18 holds (1) 83:5 home (1) 147:17 homes (2) 60:24;101:8 homesteads (1) 64:11 honest (1) 31:19 honestly (3) 201:14;202:21;203:23 hopefully (1) 206:23 horizontal (3) 40:21;94:11;151:15 hot-button (1) 117:14 hour (1) 10:3 hours (1) 195:6 house (2) 99:14;100:16 houses (1) 153:3 human (1) 140:5 hundreds (2) 49:2,2 hydraulically (1) 53:8 hypothetical (12) 71:17;110:22;111:3; 115:10;116:3,8,18;122:17; 129:13;131:14,15,21 hypothetically (1) 131:7</p> <p style="text-align: center;">I</p> <p>IDAHO (11) 7:21;28:21;102:13; 135:15;138:20;139:6; 146:13,19;161:2;171:19; 195:22 idea (2) 41:9;80:22 identical (1) 38:2 identification (1) 112:15 identified (11) 99:7;100:11;142:9;150:13, 16,25;151:5;152:1;155:17, 22;166:14 identifies (1) 105:15 identify (11) 17:17;18:24;54:8;68:20; 78:15;149:7,21;150:7;152:6;</p>	<p>155:18;206:24 idle (2) 69:19;70:6 idled (1) 70:13 IDWR (15) 19:13;30:17,24;36:11; 37:11,16,23;55:6;119:3; 142:6;144:7,16;154:12; 171:4;174:12 IDWR's (2) 176:15,16 IGWA (8) 8:21;65:22,25;66:13;82:9, 12;101:17;196:19 IGWA's (3) 98:17;174:21,22 illustrate (1) 39:16 illustration (2) 157:2,6 image (8) 34:12;60:4,8;61:1;62:8; 150:5;151:15;186:23 imagery (6) 59:19,19;61:5;78:21; 149:13;186:22 images (2) 152:23,24 immediately (1) 182:4 impact (4) 31:21;32:21;135:11; 145:23 implementation (1) 142:16 implemented (4) 87:7;88:8;157:11;182:3 implicit (1) 80:16 important (10) 42:24;44:12;47:11;82:2; 84:11,14;110:6;135:10; 143:4,14 impose (1) 206:13 imposed (1) 202:15 impossible (1) 128:4 impression (1) 185:3 improve (2) 89:4;92:1 improved (2) 158:22,25 improvement (2) 92:8,14 improvements (4) 157:11,13,20;159:8 improves (1) 88:8 inability (1)</p>
--	--	---	--

<p>205:6 INC (2) 8:10;14:21 inch (1) 61:19 inches (4) 72:14,14;146:1,2 incidental (1) 48:6 include (4) 105:19;106:5;109:14; 153:3 included (8) 13:8;15:23;59:12;153:12; 169:23;181:23;188:18;192:8 includes (1) 12:23 including (6) 47:7;61:20;86:20;91:1; 189:11;196:17 income (1) 73:11 inconsistency (1) 40:9 incorporate (1) 50:1 incorrect (3) 16:7;112:22;179:16 increase (17) 47:13,17;49:9;88:18; 89:10;92:20;114:6;122:11, 12,17,19;128:24;145:14; 146:3,4,7;159:15 increased (8) 48:21;113:5;114:15,21; 115:3;129:2;158:19,22 increases (3) 145:20,22;158:21 increasing (5) 96:8,20,21;136:13;145:13 incredulous (2) 205:15,25 independent (1) 68:8 indicate (4) 108:19;132:1;139:21; 190:14 indicated (4) 54:19;108:8;113:2;129:6 indicates (1) 107:16 individual (7) 53:17;77:8;81:18;118:17; 137:9;139:16;191:21 individuals (2) 167:13,15 industry (2) 129:19;130:10 infiltration (1) 48:9 influence (2) 44:13;68:20 inform (2)</p>	<p>168:19;182:17 information (27) 65:10;82:24;84:16; 119:22;120:7;143:19; 149:17;164:20,21;166:21; 167:13,14;168:13,21,25; 169:11,14;177:19;178:17; 180:18;182:16;183:12,16; 199:10;201:16,17;203:23 infrared (1) 140:4 in-house (1) 100:2 initial (7) 29:10,13,14;46:3;49:16; 118:20;141:18 injured (1) 204:23 injury (6) 23:21;103:25;106:24; 111:16;201:23;203:9 input (2) 59:1;92:15 inquiry (1) 117:22 in-season (25) 50:2,21;51:8,14,17;54:4; 67:5;92:2;93:3,8,18;96:14, 15;97:5;107:9;124:7,13; 132:24;133:15,21;134:4,5, 12,17,21 insert (1) 145:1 insinuate (1) 170:3 inspection (2) 58:21;59:18 installed (1) 92:5 insufficient (1) 20:14 intend (1) 165:15 intended (3) 165:12,12;201:14 intending (1) 169:9 intends (1) 166:8 intent (2) 169:16;170:1 intentional (1) 181:12 intentionally (1) 181:12 interconnected (2) 53:8,11 interdecadal (1) 95:23 interest (3) 20:16;117:13;204:25 interests (3) 11:1;16:10;204:23</p>	<p>interpretation (8) 104:22;126:25;137:7,11; 139:16,23;173:10;175:4 interrupt (1) 65:3 intersect (1) 118:6 intersected (1) 37:25 into (58) 11:18;14:2;18:20;19:2,15; 28:10;37:1;38:8;49:5;50:7; 51:16;53:2;56:11;59:1; 61:10;71:8;72:4;76:1;79:6; 88:3;89:19,23,23;91:6,14; 92:15;97:5;101:19,24; 106:20;107:7,8,21;124:24; 125:20;127:10,10;129:5; 134:11,20,21;139:12;145:1; 149:10;160:15;165:22; 167:17;173:1;185:19; 186:15;188:10;195:17; 196:9;197:12;199:3,14; 202:19;205:16 investigate (2) 173:13;175:7 investigation (1) 81:3 involved (13) 29:11;59:23;60:22;61:8; 78:9,17,19;79:12;87:22; 137:9;155:9,13;205:9 involving (2) 79:25;181:21 irrelevant (1) 79:7 irrespective (1) 96:22 irrigate (6) 73:18,24;100:3;120:25; 121:16;162:23 irrigated (144) 36:23;37:8,12;38:12,13; 39:13,14;41:21;42:15;45:10; 50:14,21,24;52:5,18;53:24; 54:8;59:25;60:1,9,10,11,23; 62:1,16,16,19,21,23;63:15, 21;64:18,18;65:8,9;66:5; 67:10;69:18;71:15;74:10,15, 24;75:9,25;76:5,6;78:16; 79:14;80:13;81:10;84:1,4,8, 15,15;85:2,8,12;92:21;93:6, 13,16;99:8,11;100:14; 105:14;106:14,15,18,20,23; 107:14;108:3,7,11;109:15, 17,20,25;110:12;111:14; 121:10,22;124:4,12;132:23; 133:9,11,12,18;137:8,19; 140:1;148:19;149:8,9,22,22; 150:7,8,9,13,16,21,25;151:6, 7,12;152:8;153:8,11,12; 155:17,19,22;161:19,25; 162:7,16;163:9,11,17;</p>	<p>164:15;186:24;187:2; 188:19,24;189:5,8;190:8,10, 18,24;191:5,6,7,10,14;192:8, 9,12,19,21;193:22 irrigates (1) 74:20 Irrigation (63) 17:19,22;18:1,5,17;19:2, 15,18,21;22:2;25:1;43:4; 45:9;47:6,9,15,19,21;48:5,6, 9,19,20;49:11;51:5;69:3,6, 10,11,15,15;71:19;72:7; 75:19;88:19;89:1,1,12,12; 90:3,9,21;91:2;93:13; 105:23;108:1;112:15; 115:25;116:1;121:15;133:8, 18;137:18;143:12;154:25; 160:6,20;161:25;178:2; 188:16;190:19,20,25 irrigator (1) 53:13 irrigators (4) 46:12,17,19;128:3 issue (4) 167:24;181:21;198:22; 205:21 issued (6) 22:5;104:8;114:13;182:3, 9;202:5 issues (5) 15:4;31:25;182:8;206:2,19 issuing (1) 181:25 Item (7) 73:4;184:3;187:21,22,22, 23;197:19 IWRRI (1) 186:25</p>
J			
			<p>Jackson (3) 165:11,13,16 January (1) 144:24 Jay (5) 46:6;69:21;86:15;135:2; 145:18 Jennifer (1) 108:20 Jennings (1) 108:20 job (1) 146:20 Johns (21) 7:9;170:9,10,17,20; 183:21,22,24;184:3,9,13,17, 25;185:21;186:8;187:9,12, 14;189:15;193:12,16 join (4) 17:20,24;29:14,22 joint (3) 199:19,21,23</p>

<p>judgment (2) 83:6;91:9</p> <p>judicial (1) 27:11</p> <p>junior (10) 16:8;22:16;23:23;25:22; 31:6,14,16,18;75:15;203:21</p>	<p>lands (23) 37:12;52:19;60:9;62:16, 19,23;64:18;65:8,9;89:8; 99:12;121:9;148:19;149:6; 150:7,8,9,16,25;153:12; 161:24;163:18;187:2</p> <p>landscaping (2) 71:21;100:15</p> <p>large (19) 45:5,18;46:5,20;47:17; 50:8,11;67:9;68:21;87:15, 20;117:5;129:22;135:15; 138:20,25;146:9,13;152:20</p> <p>largely (2) 96:15;156:25</p> <p>larger (6) 66:13,14;67:1;86:9; 204:15;206:22</p> <p>last (27) 10:14,23;19:4;21:12,19, 23;23:8,13;54:10;71:9;76:9; 96:8;116:19;122:9;144:8,20; 157:25;159:2,12;160:4; 164:10;171:14;179:14,21; 185:5;197:19;199:18</p> <p>late (4) 15:15;17:11;49:20;94:5</p> <p>later (2) 48:11,14</p> <p>lateral (1) 41:17</p> <p>laterals (4) 41:12;64:21;117:6;135:4</p> <p>latest (2) 154:7;185:5</p> <p>latter (1) 107:19</p> <p>law (2) 17:18;201:18</p> <p>layer (1) 143:16</p> <p>laying (2) 151:10;193:8</p> <p>lead (3) 46:18;49:8;195:14</p> <p>leads (2) 47:12;48:7</p> <p>learn (1) 17:9</p> <p>learned (4) 17:3;29:8;182:16,24</p> <p>lease (1) 174:3</p> <p>leases (2) 174:4,13</p> <p>least (14) 11:18;43:2;58:7;111:10; 114:5;115:2;118:20;152:11; 154:6;166:8;201:18;202:3; 204:4;206:23</p> <p>leave (2) 42:3;89:22</p> <p>leaves (1)</p>	<p>73:22</p> <p>left (5) 40:16;69:19;70:6;98:6; 137:18</p> <p>legal (6) 29:10;76:19,22;77:18; 84:22;119:2</p> <p>legally (1) 202:25</p> <p>legend (1) 151:3</p> <p>length (2) 135:6,9</p> <p>lengthy (1) 50:5</p> <p>less (10) 50:25;52:1,3;63:20;86:12; 89:2,6,11;95:5;194:4</p> <p>letter (9) 17:18,21;18:1,16;22:20; 24:8;29:18,21;30:5</p> <p>letters (4) 37:1;84:22;85:5,9</p> <p>levels (2) 48:21;129:15</p> <p>licensed (1) 76:16</p> <p>light (2) 12:5;60:20</p> <p>liked (1) 103:20</p> <p>likely (9) 33:4,10;40:25;41:3,11; 44:16,17;113:4;192:19</p> <p>likes (1) 200:21</p> <p>limit (3) 206:4,7,14</p> <p>limited (3) 69:19;112:16;136:8</p> <p>line (13) 39:1;43:16;78:25;87:17; 128:14,16;135:7;145:10; 151:10;156:24,24;175:3; 196:4</p> <p>lined (1) 87:25</p> <p>lines (7) 22:24;39:2;40:7,20;41:8; 59:24;94:11</p> <p>lining (6) 87:12,16,21;88:7,92:6; 135:6</p> <p>list (5) 11:5,15,17;118:21;165:11</p> <p>listen (1) 171:24</p> <p>listened (2) 201:6;202:20</p> <p>listening (1) 115:24</p> <p>little (23) 14:23;15:13;35:15;37:21;</p>	<p>46:22;54:2;58:3;67:4;83:7; 116:6;142:11,12;146:1; 159:19;160:18;167:3; 199:11;201:3;205:7,15,25; 206:20,21</p> <p>locate (1) 200:1</p> <p>located (3) 28:17,20;143:23</p> <p>locations (3) 82:22,22;192:22</p> <p>lodge (1) 78:23</p> <p>long (11) 19:20;57:21;78:18;79:16; 93:17;103:17;122:10; 132:22;153:4;200:6;204:5</p> <p>longer (2) 108:23;130:14</p> <p>look (41) 15:10;17:15;18:22;21:2; 23:10;28:22;29:17;30:1,2, 12,20;31:8;50:18;51:16; 54:12;55:1,1;61:19;64:9; 95:16;100:7,17;104:13; 107:10,11;108:7;109:17; 112:6;113:6;117:11;139:3; 140:5;142:14;143:4;151:9, 14;157:24;186:21;187:15; 204:11,12</p> <p>looked (12) 45:2;50:20;59:9;120:17; 135:14;138:19;149:1; 173:18,22;196:15;197:22; 198:21</p> <p>looking (27) 23:8;40:18;60:2,13;64:6; 80:3;93:25;95:7;96:6;99:10; 122:14;126:14;133:13; 136:2,21;138:22;140:3; 142:25;143:1;147:18;148:4; 164:20;165:10;175:12; 177:15;187:19;204:14</p> <p>looks (9) 36:25;57:12;62:19;95:1; 100:25;101:6,7;114:21; 150:17</p> <p>loss (6) 45:23;88:11;90:3,9,11; 115:16</p> <p>losses (5) 50:9;116:16,16;128:25; 129:16</p> <p>lost (5) 31:13,17;88:5;89:25; 144:12</p> <p>lot (9) 47:5;48:8,9;64:10;72:12; 143:9;154:13;158:17;163:3</p> <p>lots (4) 74:9;88:10;106:6;153:9</p> <p>low (12) 48:21;49:12,18,19;52:24;</p>
K			
<p>Kara (3) 173:18;175:21;181:8</p> <p>keep (9) 37:20;42:10,25;47:11; 73:24;74:1;110:25;154:13; 185:7</p> <p>keeping (1) 196:18</p> <p>K-e-n-d-a-l-l (1) 43:19</p> <p>Kent (1) 147:21</p> <p>kept (1) 70:21</p> <p>kind (13) 19:5;33:1;37:17,18;94:17; 96:1;101:4;113:3;134:19; 143:23;151:10,13;153:23</p> <p>kinds (1) 181:16</p> <p>King (8) 12:8,9,12;14:17;24:12,18, 24;26:11</p> <p>K-i-n-g (1) 14:17</p> <p>Kinyon (1) 87:11</p> <p>Klahn (1) 10:24</p> <p>knew (2) 51:12;133:25</p> <p>knowing (3) 25:17;119:6;161:18</p> <p>knowledge (5) 63:12;69:25;78:6;117:18, 20</p> <p>known (2) 53:13;74:21</p>			
L			
<p>label (1) 198:2</p> <p>labeled (3) 95:8;98:19;141:24</p> <p>lack (1) 69:23</p> <p>land (25) 43:3;52:22;53:22;60:14; 62:14,15;71:8,14;73:4,5; 74:2,6,15,23;75:9,24;81:10; 92:21;105:15,24;119:9; 140:4;151:5;153:7;161:19</p>			

80:7;85:21;129:23;146:2; 174:17,18;192:23 lower (9) 49:3,21;51:12,13;54:3; 111:1,2;126:22;146:5 lumped (1) 45:13 lunch (2) 123:12,13 lunchtime (1) 11:16	MARKED (20) 7:14;8:3;9:3;13:25;28:9; 36:4;56:9,10;60:8;100:21; 101:17,20,23;125:20; 185:18;196:8;197:12; 198:11,15;199:3 Mat (2) 166:13;167:6 matched (1) 121:25 material (7) 77:5;103:25;106:24; 111:16;168:5;201:22;203:9 math (1) 114:10 mathematical (1) 104:24 mathematically (1) 122:18 mathematics (2) 133:13;134:14 Matt (9) 54:17;166:8;170:22; 171:10,15;172:2;176:8; 180:6;182:24 M-a-t-t (1) 171:15 matter (11) 107:15;109:25;110:5,12; 117:15;133:13;168:9,24; 171:13;185:2;204:18 matters (6) 10:5;11:22;109:25;133:9; 163:1;201:9 MATTHEW (2) 7:4;171:3 Max (1) 126:5 maximum (6) 177:23;178:5,10,25;179:6, 10 may (57) 10:22;18:12;22:18,23; 23:19;24:8,10;32:15;33:17; 35:1;40:24;42:16;45:24; 49:15;51:2,18;53:11;57:14; 58:1;59:1;66:19,23;68:3; 69:19;71:13;72:13;73:17,17, 23;74:1,1;79:19,20;81:17; 89:7,22,25;92:9;116:6; 119:15;120:17,18;122:5; 123:19;134:8;140:6;164:15; 166:3;182:8,17,18,25;189:4; 191:1;197:8,8;200:2 maybe (16) 16:4;37:21;47:1;71:20; 72:9;75:8;95:2;100:19; 116:7;120:7;158:2;175:13; 195:7;205:20;206:4,19 McCain (36) 8:10;12:8,13,19;13:1,3; 14:14;15:4,12,15,17,20;16:1, 18;17:4,12,24,25;18:8,17,20;	19:1,14,25;20:2,6,8,10,16,19, 21;22:20;24:4,9,10;25:9 McCain's (6) 15:7;16:9,14;18:5;24:4; 25:6 McHUGH (31) 11:24;12:1,6,7,18;13:16; 14:3,5,12,13;15:6;17:18; 23:4,6;24:11;25:5;26:9,10, 13;27:1,4;28:1,12;32:12; 33:19;166:19;195:2,15,20; 196:4,7 McHugh's (2) 28:7;194:25 mean (22) 19:25;40:6;46:19;68:10; 69:9;72:16;75:5,7;90:11,14; 96:17;104:19;105:8;110:23; 116:15;124:14;129:2;130:7; 140:2;181:14;191:19;203:24 means (2) 39:15;66:13 meant (4) 39:14;40:1;173:9;175:2 measure (2) 33:11;93:14 measured (2) 119:25;204:3 mechanism (1) 191:22 mechanisms (3) 189:6;191:11;192:20 meet (14) 17:7;18:6,8;20:15;42:14; 46:24;48:13;49:23;91:12; 105:21,21;158:22;159:16; 161:20 meeting (2) 45:16;169:6 meetings (2) 58:3;144:8 member (2) 29:23;103:25 members (8) 37:10;66:2;84:9,23,25; 91:15;117:9,16 members' (1) 52:20 mentioned (6) 87:11,15,20;88:20;120:24; 121:3 merge (1) 118:6 merged (2) 15:1;151:13 met (5) 17:5;41:20;54:20;64:22; 124:2 metal (1) 119:3 meteorological (2) 46:16,22 method (1)	171:21 Methodology (119) 21:10;36:17,20;37:9,14; 38:5,25;39:3;40:5,11;45:11; 50:1,22;51:1,20;52:3;54:4,9, 17;55:6;58:19;66:6,7,9,12, 17;67:9;76:6,12;80:9,12,15; 83:8,11,15,19;84:7,16;85:3; 91:13,19;92:1,6,16,22;93:2, 7,10,20;96:17,21;97:1; 102:17;103:23;104:7,14; 105:18;106:9,21;107:2,11, 21;108:8;109:12;110:7,18; 111:7,19;112:13;114:12; 116:11;126:8;130:19; 132:25;133:14,24;134:14; 136:2;142:15;144:2,5; 156:21;157:21;158:18; 159:9;163:22;167:10,13; 168:14,20;169:1;171:17,22; 176:1,4,5,18,19,22;177:7,12; 178:9,20;179:5,20;180:19; 182:1,9,18;183:1;186:16; 188:10;193:23;194:1,7; 201:13;202:10,19;204:15 methods (3) 45:20;48:8;171:21 METRIC (1) 77:24 metropolitan (1) 153:5 mic (1) 195:2 microphone (1) 142:11 middle (4) 101:3;115:10;141:18; 151:11 might (7) 25:16;34:3;41:9;129:5; 134:6;188:20;206:15 Mile (1) 173:5 miles (3) 117:6;135:3,4 Milner (1) 139:12 mind (5) 42:2,10,25;47:11;98:5 minds (1) 154:16 mine (1) 194:13 miner's (1) 72:14 Mini-Cassia (6) 27:24;28:14,18,20;29:1; 31:13 minimize (1) 87:25 minor (1) 132:1 minus (6)
M			
Magic (15) 29:15,22;30:1,6,8,15,18, 25;31:3;33:7,9,13;173:5; 175:6,13 magnitude (2) 131:23;132:4 main (2) 135:4;169:18 maintain (4) 47:23;70:9;85:11;93:17 maintained (3) 46:10;119:18;128:2 maintains (1) 146:16 maintenance (1) 146:20 major (2) 49:13;61:20 makes (2) 92:2;193:2 making (7) 74:8;75:17;91:8;107:14; 175:5;186:20;193:5 mall (6) 74:25;75:3,11,13,16,20 managed (1) 161:9 Management (4) 119:21;128:9;161:11; 203:18 manager (3) 31:23;145:18;157:10 M-a-n-n (1) 43:19 manner (1) 133:6 Mann-Kendall (1) 43:18 many (10) 11:24;22:9;74:20;80:18; 90:25;155:16,21;169:24; 179:20;201:7 map (7) 39:2,18;40:18;59:24;62:1; 150:8,12 mapping (2) 61:22;108:21 March (2) 16:19,20			

<p>94:8,13,19,21;95:2;127:3 minute (4) 13:2;34:3;35:12;72:13 minutes (1) 147:21 mishear (2) 159:4,4 mislead (1) 181:13 missed (4) 66:21;173:11;175:5,22 mitigate (2) 20:22;23:21 mitigating (1) 25:19 mitigation (52) 15:25;16:6,15;17:6,20,24; 18:2,21,25;19:3,16,19,22; 20:15,17,20,23,25;21:17,18, 20,25;22:4,25;23:16,20,24; 24:2,5;25:6,10,17;26:1; 29:16,25;30:3,4,17,19;31:4; 32:21,23;33:5,8,10,11,14; 66:1,13;122:21;127:14; 205:11 mitigation-only (1) 29:23 mix (8) 143:13,21;144:10,17; 145:3,22;156:17,19 mixes (2) 144:18;164:12 model (5) 63:5,7,10;187:1;203:12 moment (6) 34:6;56:15;96:13;100:7; 105:22;189:18 moments (1) 86:16 months (1) 22:9 more (41) 26:8;42:3;44:7;47:14,19, 20;48:22;60:20;63:20,25; 64:2,9,13,14,17;65:7,15; 84:18;93:1;103:20;104:5; 117:22;122:8,12,23;123:8; 128:9;137:22;138:17; 158:23;159:17;160:19; 163:4;182:18;183:7;189:10, 11,15;194:4,25;195:17 morning (11) 10:6;12:6;14:13;24:24,25; 25:3;27:5,6;35:5,7;57:18 most (5) 30:3;120:12;182:14; 188:7;198:22 mostly (1) 149:4 motion (6) 77:3;199:19,21,24;200:2, 11 move (5)</p>	<p>44:9;55:21;76:25;101:16; 167:19 moved (1) 190:21 moving (2) 185:7;198:12 much (22) 42:21;50:8,12,13;64:9; 71:24;78:2,6;81:9;117:17; 122:2;127:20;137:10; 143:10;174:15;180:6,23; 201:11;202:20;203:9,12; 206:20 multiple (3) 53:9,10;136:6 multiplier (1) 147:22 multiplying (1) 131:8 municipalities (2) 38:15;42:7 must (7) 22:6;49:8;107:25;116:17; 128:1;129:2;161:20 mute (2) 134:22,25 myself (2) 36:15;103:13 mysterious (1) 53:12</p>	<p>131:9,16,20;143:8,10,15; 144:12,19;145:3;158:19; 160:1;163:3,5;164:9,14; 168:11;169:7,7,24;177:23; 178:6,11;179:1;188:25; 189:12,18;190:3;204:10,12, 14;205:22;206:16,22 needed (12) 17:25;32:17;45:15;49:14; 52:7;58:1;67:20;73:11; 82:14,22;175:17;206:9 needing (1) 83:25 needs (6) 74:13;134:22;200:20; 201:12;202:16,18 nefarious (2) 169:16;170:4 negatives (1) 196:3 negotiated (1) 194:25 negotiations (3) 168:18,21,23 neither (1) 82:12 net (4) 84:1,3,5;108:2 new (5) 26:2;122:24;160:12; 162:20;178:10 newly (1) 101:8 next (19) 11:23;18:18;26:12;33:24; 34:3;73:3;101:17;123:15; 124:20;140:23;157:4; 159:18;165:9;174:20;189:5, 8;191:6,7,19 nice (1) 53:7 night (3) 10:14,23;199:18 nine (1) 201:1 nobody (1) 200:21 none (2) 152:10,22 nonused (1) 16:4 Nope (1) 140:16 normal (1) 55:3 north (10) 40:18;86:3,5;139:5,8; 151:22;174:24,25;180:14; 181:21 north/south (1) 151:10 note (7) 77:10;172:12,24;173:3,19;</p>	<p>174:13;181:5 notes (2) 13:6;195:7 notice (6) 18:25;22:15;23:17;30:17; 197:8;199:19 notified (1) 18:19 notify (2) 162:6,15 November (2) 54:18;127:8 nuance (2) 206:20,21 nuances (1) 204:11 number (35) 38:7;40:20;47:1;53:23; 66:5;70:11;76:9;78:15,22; 95:7;98:17;103:25;106:19, 23;107:4;111:14;113:12; 115:22;116:21;117:2; 124:15;131:5;133:9;136:20; 145:1;152:6;158:16;172:19; 188:5;192:18,20,24;198:4; 206:8,15 numbered (6) 58:13;68:19;98:15;187:18, 22,23 numbering (1) 98:14 numbers (13) 111:13;117:1,12;119:3,3; 154:17;172:18;176:2,5; 178:4,24;179:1;184:8 numerical (1) 112:6</p>
N			
<p>name (6) 14:15;27:7;35:22;126:5; 141:17;171:13 narrow (3) 105:17,21;183:11 naturally (1) 49:12 nature (4) 42:18;61:15;72:10;99:23 near (1) 46:9 nearly (1) 38:2 necessarily (5) 47:16;105:8;130:7; 191:19;203:17 necessary (6) 22:9;23:20;46:7;127:25; 128:8;158:21 necessitated (1) 49:1 need (69) 10:5;11:22;16:2;25:17; 31:19;32:6;33:10;34:13; 45:9;49:18,21;50:25;58:1; 59:8;73:1,10,17,24;74:14; 75:22;86:1;87:3;91:11,20, 21;93:12;96:14,22;97:4; 100:1;105:18;106:12;107:6; 116:23;124:13;125:10;</p>	<p>newly (1) 101:8 next (19) 11:23;18:18;26:12;33:24; 34:3;73:3;101:17;123:15; 124:20;140:23;157:4; 159:18;165:9;174:20;189:5, 8;191:6,7,19 nice (1) 53:7 night (3) 10:14,23;199:18 nine (1) 201:1 nobody (1) 200:21 none (2) 152:10,22 nonused (1) 16:4 Nope (1) 140:16 normal (1) 55:3 north (10) 40:18;86:3,5;139:5,8; 151:22;174:24,25;180:14; 181:21 north/south (1) 151:10 note (7) 77:10;172:12,24;173:3,19;</p>	<p>newly (1) 101:8 next (19) 11:23;18:18;26:12;33:24; 34:3;73:3;101:17;123:15; 124:20;140:23;157:4; 159:18;165:9;174:20;189:5, 8;191:6,7,19 nice (1) 53:7 night (3) 10:14,23;199:18 nine (1) 201:1 nobody (1) 200:21 none (2) 152:10,22 nonused (1) 16:4 Nope (1) 140:16 normal (1) 55:3 north (10) 40:18;86:3,5;139:5,8; 151:22;174:24,25;180:14; 181:21 north/south (1) 151:10 note (7) 77:10;172:12,24;173:3,19;</p>	<p>newly (1) 101:8 next (19) 11:23;18:18;26:12;33:24; 34:3;73:3;101:17;123:15; 124:20;140:23;157:4; 159:18;165:9;174:20;189:5, 8;191:6,7,19 nice (1) 53:7 night (3) 10:14,23;199:18 nine (1) 201:1 nobody (1) 200:21 none (2) 152:10,22 nonused (1) 16:4 Nope (1) 140:16 normal (1) 55:3 north (10) 40:18;86:3,5;139:5,8; 151:22;174:24,25;180:14; 181:21 north/south (1) 151:10 note (7) 77:10;172:12,24;173:3,19;</p>
O			
<p>oats (1) 146:2 object (2) 182:21;200:6 objected (1) 70:22 objection (12) 10:17;13:23;56:8,10; 70:14,16;78:23;79:9;101:21, 23;183:3,10 objections (1) 185:16 objectives (1) 88:6 obligation (3) 74:4,18;161:20 obligations (4) 48:13;49:23;66:13;122:22 observation (2) 44:11;86:13 observed (7) 51:10,23,24;93:15;107:3; 133:16,19</p>	<p>oats (1) 146:2 object (2) 182:21;200:6 objected (1) 70:22 objection (12) 10:17;13:23;56:8,10; 70:14,16;78:23;79:9;101:21, 23;183:3,10 objections (1) 185:16 objectives (1) 88:6 obligation (3) 74:4,18;161:20 obligations (4) 48:13;49:23;66:13;122:22 observation (2) 44:11;86:13 observed (7) 51:10,23,24;93:15;107:3; 133:16,19</p>	<p>oats (1) 146:2 object (2) 182:21;200:6 objected (1) 70:22 objection (12) 10:17;13:23;56:8,10; 70:14,16;78:23;79:9;101:21, 23;183:3,10 objections (1) 185:16 objectives (1) 88:6 obligation (3) 74:4,18;161:20 obligations (4) 48:13;49:23;66:13;122:22 observation (2) 44:11;86:13 observed (7) 51:10,23,24;93:15;107:3; 133:16,19</p>	<p>oats (1) 146:2 object (2) 182:21;200:6 objected (1) 70:22 objection (12) 10:17;13:23;56:8,10; 70:14,16;78:23;79:9;101:21, 23;183:3,10 objections (1) 185:16 objectives (1) 88:6 obligation (3) 74:4,18;161:20 obligations (4) 48:13;49:23;66:13;122:22 observation (2) 44:11;86:13 observed (7) 51:10,23,24;93:15;107:3; 133:16,19</p>

observing (1) 134:14	196:3,6,8,11,25;197:10; 198:4,12,15,19;199:1,6,13, 17;200:4,12;201:3;206:8,11, 13;207:3	operate (5) 20:9,24;45:15;117:17; 191:23	48:24
obtain (1) 199:23	official (1) 199:19	operates (3) 28:14;146:16;204:15	ordinary (1) 46:23
obvious (1) 96:7	often (2) 131:5;139:19	operation (2) 31:13;130:14	organization (3) 143:22,25;149:5
obviously (5) 50:23;85:25;104:21; 111:3;126:24	old (4) 149:20;164:6,8;192:14	operational (11) 45:14;46:6;48:1;91:2; 115:17;116:17;127:25; 128:8,12;129:2,5	organizations (1) 146:18
occasions (1) 67:19	oldest (1) 149:25	operations (2) 32:22;130:3	organize (2) 195:6,7
occupation (2) 36:2;141:22	omits (1) 39:13	operator (1) 53:18	original (2) 101:6;158:9
occur (7) 46:2;52:19;104:23; 106:16;128:21;157:3;188:6	omitted (2) 39:17,19	operator (1) 53:18	originally (2) 13:7;16:10
occurred (4) 87:19;160:5;177:9;192:14	on/off (2) 47:20,23	opinion (16) 37:5;41:13;50:19;55:15; 64:16;65:7,14;74:10;75:1, 17;105:19;112:9;127:23; 135:19;164:15;200:18	others (8) 11:2;68:5;89:22;100:8; 109:1;143:1;155:12;199:17
occurs (6) 42:20;48:3,10;75:19; 86:11;118:11	Once (6) 18:16;22:5;87:2;182:10; 194:25;195:3	opinions (4) 54:12;76:22;142:23; 146:15	otherwise (2) 106:17;134:2
o'clock (1) 10:3	on-demand (1) 139:8	opportunities (3) 205:11,12,13	ought (1) 52:2
October (2) 49:20;50:4	one (54) 10:7,10;24:17;25:4;27:23; 42:3,5,11;44:15,16;47:19; 52:5;53:5;54:10;64:20,23; 67:23;76:10;77:18;87:15; 93:17;94:12,12;95:19;101:2; 103:4;105:2;107:13,14,19; 117:22;122:8,9;126:13; 127:3;129:4;130:3;159:1,3; 166:15,15;171:14;172:9,18; 174:20;183:9;184:3;185:5; 187:18;191:8,18;197:19; 204:18;206:18	opportunity (3) 205:17,19,23	out (32) 17:12;30:8;37:10;38:11; 39:21;45:12;55:18;58:6; 60:24;61:13;62:20;73:19; 78:5;81:9;86:16;88:1;94:24; 99:15;136:1;137:18;153:2; 154:4;166:17;176:4;177:7; 179:14,20;181:13,17;205:1, 4,5
off (10) 34:3,5;46:19;56:17,19,20; 125:14,16;134:25;161:8	one-for-one (2) 54:7;111:18	opposed (2) 47:20;172:19	outdated (1) 130:14
offensive (1) 170:4	one-fourth (1) 73:16	option (1) 30:1	outliers (2) 94:17,24
offer (9) 11:20;165:22;166:18,18, 20;167:16;184:6;195:15; 199:12	ones (1) 15:24	orange (1) 94:17	outline (3) 165:25;166:17,22
offered (6) 11:18,19;13:1;52:12; 54:13;142:24	one's (6) 191:5,6,6,6,7,7	oranges (1) 159:20	outlined (3) 38:9;110:17;133:14
offering (4) 166:19;167:5;168:8,24	on-farm (10) 45:19;46:16,18;47:13; 50:8;89:3,9;115:15;116:4; 128:24	order (106) 18:8,13;22:5;24:1,6;36:17, 17,21,21;43:17;44:18;45:11; 46:8,10;49:22;50:1,22; 51:20;54:17;58:19;66:7,7,9; 67:9;76:6;80:10,12,15; 81:25;83:8,12,15,19;84:8; 85:3;91:14,19;92:1,7,22; 93:2,7;96:17,21;102:17; 103:23;104:8,12,14;106:9; 107:2,11;108:8;109:13; 110:18;111:7;112:13; 114:13;116:11;120:17,22; 121:3,14,20;127:25;128:2; 130:19;136:2;142:15,15; 158:19;163:22;167:10,13; 168:14,20;169:1;170:15; 171:18,22,23;176:1,5,18,19, 22;177:7,12;178:9;179:5,20, 25;180:19;182:1,2,9;183:2; 186:16;188:10;192:1; 193:23;194:1,8;201:13; 202:11,19	outside (5) 28:21;68:5;167:14,15; 182:22
office (5) 17:19;108:11;109:1; 118:4;153:22	ongoing (2) 189:7;191:9	orange (1) 94:17	outstanding (1) 74:5
OFFICER (143) 10:3,9,17;11:14;12:3,9,17; 13:15,19,23;14:4,6;24:12,18; 26:8,11,15,24;28:7,33;20,24; 34:5,8,24;35:12,16,20;56:5, 13,14,16,19,21,24;57:2,8,12; 70:18,20;71:1,5;77:3,16; 79:8;98:2,8,12;101:21; 102:4;106:16;113:12,14; 123:6,8,11,14,18;124:20; 125:1,6,13,17,24;132:8; 138:10;140:9,11,14,17,22; 141:1,9;146:25;147:4,9; 156:2;165:3,8,15,18,23; 166:2,7;167:1,18;168:7,15; 169:4,13;170:7,13,18,22; 171:1;172:14,21;179:24; 182:23;183:4,6,15,19,23; 184:1,8,10;185:1,9,12,15; 189:16,21;193:12,15;194:11, 14,17;195:4,10,13,19,23;	online (1) 34:14	oranges (1) 159:20	over (25) 15:13;27:17;41:2,7;42:21; 52:15;100:1;111:6;112:4; 114:6;135:3;143:3;144:11, 15;146:1;150:17;159:18; 162:16;163:2,18;164:16; 187:15;188:16;203:25;204:5
	on-screen (1) 34:12	order (106) 18:8,13;22:5;24:1,6;36:17, 17,21,21;43:17;44:18;45:11; 46:8,10;49:22;50:1,22; 51:20;54:17;58:19;66:7,7,9; 67:9;76:6;80:10,12,15; 81:25;83:8,12,15,19;84:8; 85:3;91:14,19;92:1,7,22; 93:2,7;96:17,21;102:17; 103:23;104:8,12,14;106:9; 107:2,11;108:8;109:13; 110:18;111:7;112:13; 114:13;116:11;120:17,22; 121:3,14,20;127:25;128:2; 130:19;136:2;142:15,15; 158:19;163:22;167:10,13; 168:14,20;169:1;170:15; 171:18,22,23;176:1,5,18,19, 22;177:7,12;178:9;179:5,20, 25;180:19;182:1,2,9;183:2; 186:16;188:10;192:1; 193:23;194:1,8;201:13; 202:11,19	overall (11) 32:6;40:1;47:17;49:18; 52:25;54:23;80:8;85:22; 115:17;120:18;135:11
	open (6) 50:11;104:22;109:18; 135:15;146:9,13	Orders (2) 21:10;36:22	overcome (1) 49:17
		ordinance (1) 43:6	overestimated (1) 50:3
		ordinarily (1)	overlaid (3) 39:5;137:4;163:18
			overlap (2) 118:7,11
			overly (1) 127:14

<p>overmitigating (1) 127:16</p> <p>Overruled (1) 71:5</p> <p>overstating (1) 111:14</p> <p>overview (1) 50:6</p> <p>own (13) 18:2,5;20:15,17,19,22,24, 24;21:20;29:25;30:2;32:21; 193:2</p> <p>owned (2) 69:1,10</p> <p>owner (1) 36:3</p> <p>ownership (1) 119:9</p> <p>owns (1) 119:6</p>	<p>Pardon (2) 14:4;185:12</p> <p>parking (3) 74:9;106:6;153:8</p> <p>part (47) 15:25;19:20;30:8,25;37:6, 7;38:17;41:25;42:3;43:7,10; 44:8,25;45:3;50:18,20;52:9, 12,16;54:10,12,14;59:9; 61:22;70:6,9,13;73:12,22; 79:14;86:18,22;87:9;111:25; 115:5;117:23;142:20;148:6; 153:14;155:9;163:8;169:11, 20,23;188:7;193:23;197:7</p> <p>Partially (1) 84:13</p> <p>participate (2) 10:15;58:24</p> <p>participated (2) 148:21;171:22</p> <p>participating (1) 140:19</p> <p>participation (2) 10:19;201:7</p> <p>particular (11) 16:9;45:5;53:6;74:18; 89:6,7,8;137:15;144:13; 186:23;193:9</p> <p>particularly (2) 46:9;163:10</p> <p>parties (25) 10:13,18;11:14;12:25; 13:11,17;28:5,8;56:7;57:4; 68:15;124:23;125:18;147:4; 165:12;182:2;195:24; 196:11,20;197:1,8,25; 198:19;199:8;200:7</p> <p>parties' (1) 13:6</p> <p>parts (5) 37:1,4;59:11;103:9;183:1</p> <p>party (1) 68:9</p> <p>past (6) 25:10;134:11;149:22,23; 158:2;159:3</p> <p>patience (1) 207:3</p> <p>PATTERSON (10) 101:18;196:14,15;197:5, 16,19;198:5,14,17;199:5</p> <p>Paul (1) 28:21</p> <p>PCC (1) 119:25</p> <p>PE (2) 34:19;141:4</p> <p>pending (2) 16:25;24:1</p> <p>people (8) 104:23;161:8;201:20; 204:20,24;205:11,12,16</p> <p>per (5) 72:13;114:7;135:18;146:1, 2</p> <p>per-acre (1) 72:17</p> <p>percent (29) 45:20,21,24;47:10;51:12, 13;52:1,2;73:22;88:21,21; 92:21,21;105:9;111:2,4; 115:15,16,17,18,21,25; 116:5,9,12;117:3,7;146:3,7</p> <p>percentage (4) 47:9;52:22;80:7;85:20</p> <p>percentages (1) 86:9</p> <p>percentile (6) 55:7,9,10,13;126:9,22</p> <p>percolation (1) 90:20</p> <p>perennial (1) 48:24</p> <p>perfect (4) 105:9;120:7,11,12</p> <p>perform (1) 118:10</p> <p>performance (1) 174:23</p> <p>performed (2) 68:8;186:18</p> <p>perhaps (2) 34:11;104:5</p> <p>period (21) 42:21;44:12,15,17,20,22; 46:17,25;72:8;95:12,16; 112:22;114:17,19,22; 134:11;136:2;144:9,15; 145:8;188:16</p> <p>periodic (1) 191:16</p> <p>periods (2) 72:19;96:4</p> <p>permissible (3) 162:4,11;188:15</p> <p>permission (1) 10:15</p> <p>permit (1) 160:12</p> <p>person (1) 124:2</p> <p>personal (2) 63:12;69:25</p> <p>personally (2) 78:2;108:25</p> <p>personnel (2) 67:14;155:7</p> <p>perspective (2) 170:3;202:10</p> <p>pertaining (1) 186:19</p> <p>Pete (2) 11:4,7</p> <p>petition (1) 17:23</p> <p>petitioning (1) 17:19</p> <p>PG (2) 7:4;171:3</p> <p>PhD (1) 34:19</p> <p>photo (9) 38:12;39:4,6;40:7;58:21; 59:18,23;79:18;109:10</p> <p>photograph (1) 150:20</p> <p>photography (8) 149:2,3,11,14,15,19,25; 154:7</p> <p>photos (2) 139:20;149:20</p> <p>phrase (1) 104:14</p> <p>pick (2) 112:22;193:20</p> <p>picked (1) 92:11</p> <p>picture (1) 44:19</p> <p>pin (1) 105:3</p> <p>pipeline (2) 160:14,22</p> <p>pivot (8) 38:12;41:6;45:21;47:13; 100:8,24;101:14;190:14</p> <p>place (4) 79:4;162:11;188:15; 205:24</p> <p>placed (2) 161:6;162:12</p> <p>place-of-use (1) 154:12</p> <p>places (6) 81:6;122:1;132:3;162:4,6; 174:11</p> <p>Plain (3) 15:8;27:23;47:6</p> <p>plan (49) 15:25;16:6,15;18:3,5; 19:19,22;20:15,17,20,24,25; 21:17,18,20,25;22:4,5,6,7, 25;23:16,21,24;24:2,5;25:6, 10,15,18,23;26:1;29:16,25; 30:3,4,19;31:4;32:21,24; 33:5,8,10,11,14,18;75:1; 93:5;146:21</p> <p>plans (2) 17:6;205:11</p> <p>plant (2) 31:23;162:21</p> <p>planted (1) 162:17</p> <p>play (2) 134:20,20</p> <p>played (1) 171:17</p> <p>Please (25) 12:17;14:15;23:25;26:16,</p>		
<p style="text-align: center;">P</p>			
<p>page (70) 21:8,12,12;42:1;43:7; 44:25;50:19;52:12;58:13,13; 59:14,15,17;62:7;68:17,18; 73:3;76:8,8;77:1;79:25;80:3; 83:21;85:16;93:23;104:13; 105:11;106:9;107:10; 112:14;115:8,9;121:5; 142:18;145:6;147:25;148:2, 3,9;150:2;156:13,15;157:8, 25;159:11,13,18;160:3; 161:14;172:4,5,5,6,17,18,19; 176:8,10;177:4,14,17,18; 178:13,16,23;187:15,22; 206:4,7,13</p> <p>pages (6) 58:12;98:23;113:7; 142:20;178:21;187:18</p> <p>paid (2) 65:18;185:6</p> <p>paragraph (43) 19:4;21:19,23;23:7,9,10, 16;58:18;68:25;71:7;74:3; 76:10;77:1;80:4;83:22,24; 85:19;106:11,11;107:11,22, 24;115:11;116:25;121:6; 160:3,4;161:15,17;172:11; 176:11;177:2,15,18,20,21; 178:12,18,19;179:6,7,10,19</p> <p>paragraphs (2) 68:19;109:24</p> <p>parallel (3) 94:12;151:23;152:1</p> <p>parameter (1) 45:13</p> <p>parcel (6) 71:13;72:18;119:8;189:4, 7,8</p> <p>parcels (2) 82:2;186:22</p>			

<p>24;27:8;32:9;34:15;35:11, 21;37:5;39:10,24;77:21; 141:2,9,16;147:24;159:2; 171:1,13;172:2,10;173:1; 174:20 plus (6) 94:8,13,19,21;95:1;201:1 pm (1) 207:6 POCATELLO (3) 7:21;126:6;195:21 Pocatello's (1) 158:14 podium (2) 195:14,15 point (19) 53:19;57:3;76:9;93:14; 116:25;117:4;119:14; 120:16;122:2,4;127:20; 128:12,15;129:20;130:3,4; 181:17;200:1;205:5 pointed (1) 136:1 pointing (1) 181:13 points (7) 43:15;81:6;118:14,16; 122:1;169:18,18 policies (1) 73:14 policy (1) 127:22 polygon (1) 109:7 polygons (1) 109:4 Pond (1) 87:11 ponds (7) 38:10;41:14;68:25;69:8, 10,14;109:19 poorly (1) 181:14 portion (5) 60:3;85:15;98:20;150:5; 197:21 portions (1) 171:23 position (9) 27:13;54:23;108:6;110:2; 112:3,6,21;203:7,8 possibility (3) 129:4;205:1,24 Possible (7) 22:15;63:16;67:10; 126:21;155:17,22;182:11 Possibly (4) 128:11;130:16;158:15; 182:10 Post (1) 173:5 post-hearing (2) 200:15;206:5</p>	<p>potatoes (1) 162:22 potential (5) 22:4;29:8;31:5,24,25 potentially (5) 33:2;47:2;48:13;53:23; 75:15 Powell (2) 36:15;103:13 power (1) 140:5 PPUs (1) 162:6 practices (4) 108:1;112:15;116:1; 121:15 preceding (1) 156:17 precise (3) 62:1;64:9,13 precisely (1) 105:3 predecree (1) 79:6 prefer (1) 170:15 pre-GIS (1) 79:20 preliminary (1) 10:5 preparation (1) 83:12 prepare (13) 57:4;62:1;103:7,11,17,21; 137:22;161:20;187:3; 204:21;205:7,14,19 prepared (10) 36:14;42:14;47:22;74:5, 14;75:12;103:12,14,14; 163:19 preparing (3) 79:13;85:8;187:2 pre-partial (1) 79:1 present (3) 41:4;167:24;186:11 presentation (1) 170:15 presented (8) 11:21;54:18;68:14; 196:21;197:3,5;201:12,17 presumption (3) 202:3,7;203:1 pretty (6) 32:4;50:12,13;92:20; 109:9;146:3 prevent (2) 25:14,16 previous (6) 53:20;77:4;107:1;127:17; 175:3;178:22 Previously (7) 14:21;66:6;97:20;171:5;</p>	<p>172:3;186:3;196:23 primarily (5) 36:22;37:10;38:10; 117:14;143:5 primary (6) 27:16,19;30:16;38:14; 42:5;59:2 principle (2) 50:23;133:8 prior (14) 25:15;36:11;42:13;65:22; 83:12;142:6;143:18;144:16; 149:2;161:25;191:25;192:3, 11;204:23 priorities (1) 169:6 prioritize (1) 169:24 prioritizing (1) 35:15 priority (9) 16:8;20:17;22:16;23:23; 25:20,25;26:4;31:11;63:15 private (6) 52:17;61:14;69:1,8; 118:17;174:4 privately (2) 69:10;118:21 privilege (1) 168:22 probability (3) 55:2;192:21,23 probably (10) 28:1;35:9;57:23;80:16; 82:20;95:1;96:10;103:19; 111:4;200:21 problem (2) 40:2;177:6 procedure (1) 10:11 proceeding (3) 14:19;27:11;79:2 process (25) 20:10,11;22:9;32:2,25; 59:20;60:17;64:12,13;67:24, 25;78:14,17;79:1,6;139:24; 148:17,24;155:10,13;182:6, 7;200:17;202:22;204:20 processes (1) 200:15 processing (2) 27:19,23 produce (1) 96:21 produced (1) 180:18 producer (2) 21:16,17 product (1) 142:21 products (1) 37:11 professional (1)</p>	<p>61:23 program (6) 70:6,13,24;73:15,21; 174:11 project (65) 36:23;37:8;41:20;45:4,8, 13,16,24,24;46:3;47:2,4,17; 48:12;49:9,19;50:11,16; 51:3,4,6,12;54:1;58:14;67:3, 3;87:16,21;90:23;91:1,6,15; 92:6,17;93:11;96:13;97:3; 105:13;107:5,6,8;111:1; 115:17;116:9;117:8,17; 128:19;129:1,8,24;130:2; 131:8,13,17,22;132:2; 133:17,20;134:1;135:7; 145:24;146:9;148:1,12; 187:20 projected (8) 177:23,24,24;178:1,5,11, 25;179:6 projecting (1) 106:24 projects (5) 87:12,15;88:7,15;116:11 proof (8) 165:22;166:18,20;167:16; 168:9,24;202:17;203:15 proper (1) 179:19 properly (1) 109:10 properties (2) 119:7;152:17 property (2) 204:23,25 proportional (1) 134:16 proportionate (1) 124:9 proposed (6) 16:24;17:9;23:16,20,24; 29:4 protect (3) 20:13;55:12;126:10 protected (1) 19:23 protecting (1) 55:16 protest (1) 22:7 protested (2) 22:8;23:24 protests (1) 23:19 protocols (2) 104:24,25 provide (8) 14:18;36:21;66:14; 121:21;122:23;126:23; 127:14;133:3 provided (8) 37:16,18,23;66:1;85:21;</p>
--	--	--	--

<p>109:21;144:6;182:2 provides (2) 126:9,17 providing (1) 16:13 provisions (1) 50:2 prudent (1) 128:9 public (3) 64:8;82:20,23 publish (1) 23:17 pull (1) 142:11 pulled (4) 39:15,25;102:22;103:1 pumping (2) 20:22;201:24 pumps (2) 53:10,10 purely (2) 131:14;168:5 purpose (2) 30:16;188:14 purposes (11) 17:20,24;18:21;52:18; 69:15;78:16;80:5;100:3; 157:2,6;167:21 push (1) 97:17 put (9) 25:23;33:10;75:11; 116:21;154:13;165:22; 166:17;183:17;205:24</p>	<p>quoted (1) 85:19 quoting (1) 104:12</p> <p style="text-align: center;">R</p> <p>rainy (1) 46:17 raise (3) 26:17;34:16;206:2 raised (2) 144:14;182:8 raising (1) 158:23 ramp (1) 46:24 random (1) 192:17 range (4) 45:24;94:22;111:9;116:5 ranges (1) 45:19 ranking (1) 55:1 rapid (1) 46:18 rarely (1) 53:6 Raster (3) 37:19,23;163:17 r-a-s-t-e-r (1) 37:19 Rasters (1) 37:15 rate (5) 42:21;49:16;72:19,23; 135:19 rates (2) 72:9;129:2 rather (3) 18:1;35:17;204:10 rationale (1) 190:22 reach (1) 94:17 react (1) 33:1 read (18) 21:23;23:2,13;71:4;83:9; 106:11,12,13;157:9;158:1,9; 159:11;160:18;173:1; 174:20;177:1,2;178:7 read] (1) 58:20 readily (1) 119:11 reading (1) 49:25 readjudicate (1) 79:5 reads (1) 172:11</p>	<p>ready (2) 34:10;205:17 real (5) 41:19;64:22;105:20; 142:10;205:2 realize (2) 171:12;174:14 realizing (1) 172:17 really (9) 53:14,16;58:7;81:21; 107:15;117:2;124:7;189:19; 206:22 realm (1) 204:15 reask (1) 180:21 reason (10) 25:23;38:4;67:11;117:11; 120:23;169:16;201:15; 202:14,18;206:7 reasonable (54) 50:2,21;51:7,14,17;54:4; 55:4,18,19;67:5;76:7,12; 77:13,16;92:2;93:3,8,18; 96:14,14;97:4;105:5;107:8; 124:7,12;126:10,17,23,24; 129:9,12,17;130:3,4,7,8,9, 14;132:24;133:15,21;134:4, 5,12,17,21;135:18;146:21; 157:14;162:14;176:12; 178:19;188:1;191:9 reasonableness (1) 91:9 reasonably (6) 55:8,14;105:1;117:1; 120:12;129:16 reasons (5) 47:18;183:9;188:6; 192:18;206:18 rebut (1) 170:11 REBUTTAL (10) 7:4,8;166:3,6;170:9;171:4; 183:17,20;185:22;186:2 recalculate (1) 134:1 recall (19) 25:7;78:20;86:22;87:13; 91:3;133:1;135:24;136:5; 137:1,5,24;139:17;148:17; 149:25;165:11;166:8; 180:15;186:14;197:20 recapitulation (1) 54:15 receipt (1) 23:16 receive (6) 28:9;81:23;197:12;199:2, 14;206:15 RECEIVED (24) 7:14;8:3;9:3;10:23;11:17; 14:2,9;22:20;24:9,10;28:11;</p>	<p>56:11,12;101:24;102:1; 125:20,22;185:19,20;196:9, 10;197:18;199:4,16 receives (1) 81:10 recent (9) 87:7;95:5;107:25;113:4; 145:20;149:9,23;164:10; 194:4 recently (1) 58:8 recess (1) 11:16 recharge (20) 43:14,25;44:5;48:6;90:20; 145:12;173:4,7,21,23,24,25; 174:7,11,24;175:6;180:13, 23;181:4,21 recharging (1) 173:4 recite (1) 14:1 recognition (1) 78:5 recognize (5) 10:21;29:18;99:3;101:10; 147:5 recognized (4) 56:6,7;147:1,6 recognizing (1) 79:10 recollection (5) 79:17,19,22;143:20; 160:12 recommendation (1) 163:20 recommendations (2) 144:1;186:20 reconciliation (1) 127:9 reconsider (1) 205:22 record (36) 10:4;14:16;27:8;34:4,5,8, 9;35:22;38:23;39:11,23; 44:21;56:17,19,20,21;57:8; 71:4;77:2,11;123:15;125:12, 16,17;141:17;165:22;168:4; 171:14;173:2;195:10,17; 198:9;199:3,15;200:10; 207:4 recorded (1) 175:15 records (3) 61:4;81:21;153:19 recover (1) 10:12 Recross (5) 138:10;140:17;194:11,12, 13 RE CROSS-EXAMINATION (1) 138:14 rectification (1)</p>
<p style="text-align: center;">Q</p> <p>qualified (3) 36:10;76:21;142:5 qualifies (1) 109:17 quantify (1) 53:21 quantities (1) 202:8 quantity (3) 188:24;191:16;192:11 quarter (2) 123:12;195:8 quarter-acre (1) 72:12 quibble (2) 64:23,24 quick (7) 46:24;124:3;142:10; 165:22,25;166:1,12 quickly (2) 187:15;206:16 quite (4) 71:9;86:20;109:11;146:3 quote (1) 108:20</p>			

40:6 rectified (1) 109:10 red (8) 39:1;98:23;99:2,13;100:7, 17,21;101:3 redacted (1) 77:1 redelivery (1) 48:8 Redirect (6) 26:9;132:11,13,20;165:6; 193:12 redivert (1) 49:4 rediverted (2) 48:12,16 redline (1) 198:1 red-shaded (2) 137:4;139:15 reduce (9) 46:20;53:23;54:1;111:4; 116:23;157:19;158:17,25; 159:7 reduced (4) 92:13;111:5;128:9;158:20 reduction (7) 48:6,7;50:21;52:6;54:7; 116:24;134:16 reevaluate (1) 97:22 refer (3) 69:17;72:22;121:5 reference (6) 77:4,12,13;156:20,25; 198:9 references (2) 77:7;185:2 referred (4) 58:18;152:17;177:22; 206:6 referring (11) 72:23;77:6;84:3;95:12; 102:21;173:19;174:8,13; 175:23;181:5;198:10 refers (1) 151:24 refile (1) 200:2 refine (1) 201:13 reflect (2) 94:13;142:21 reflected (1) 124:12 regard (2) 154:1;186:19 regarding (2) 78:25;186:14 regardless (1) 74:6 registration (2)	40:4,6 regression (1) 135:22 regroup (1) 57:4 regulating (1) 69:14 reissuance (1) 201:15 related (4) 16:14;46:1;180:10,13 relates (3) 14:19;15:3;36:22 relating (6) 12:14;26:21;34:21;141:6; 171:5;186:4 relative (9) 16:9;20:11;30:14;36:16; 37:9;42:10,25;58:2;66:17 relatively (3) 49:18;94:4;191:12 released (1) 48:11 relevance (1) 204:8 relevant (3) 14:19;79:2;167:10 reliability (3) 52:25;80:8;85:22 reliable (6) 82:1;85:25;86:12;120:6, 12;122:2 reliably (2) 46:13;128:4 relied (1) 48:7 rely (1) 200:5 remained (1) 94:4 remaining (2) 71:19;74:2 remember (10) 18:11;78:18;87:9;95:25; 96:4;153:4,6;161:3;180:25; 201:19 reminded (1) 154:13 remote (1) 10:19 remotely (2) 10:15;34:22 remove (1) 41:14 removed (6) 13:8;40:11,12,15;41:12; 42:6 removes (3) 197:24;198:10,18 removing (1) 52:5 render (3) 76:22;112:9;130:14	rendering (2) 65:14;74:10 renting (1) 66:1 renumber (1) 98:16 repeat (4) 37:18;67:21;184:23;188:8 replies (1) 200:23 report (60) 36:14,19,25;38:9;43:15; 52:12;55:24;56:4;58:9; 59:12,15,17;62:7;68:18; 69:12;75:12;76:25;79:25; 85:16;93:22;94:3,7;95:7; 98:22;99:4;102:19,20; 103:18;104:10;105:12; 107:16;110:2;111:25;113:7; 115:6;126:7;127:24;128:18; 131:12;137:22;142:9,21; 146:24;147:3,25;148:6; 150:2;156:12;163:8;172:3,5; 174:23;180:10;181:13; 197:22,24;198:2,7,10,17 reported (4) 143:20;185:7;204:4,4 REPORTER (23) 11:10;14:23;32:9;37:17, 20;41:1;44:2;52:14;55:25; 66:20,24;67:16;71:4;82:17; 86:4,6;96:1;99:25;123:17; 162:9;184:20;195:12;196:18 reports (3) 77:8,11;206:21 represent (7) 42:7;59:25;99:6;101:13; 108:1;109:5;126:5 representation (4) 65:8;124:8;191:9;192:23 represented (9) 11:1;13:16;83:25;108:2; 184:10;197:11,11;199:2,14 representing (1) 100:23 represents (1) 94:22 reproduction (1) 54:17 request (5) 30:16;60:18;169:12; 183:19;184:6 requested (1) 166:13 requesting (2) 19:4;29:21 require (3) 26:1;82:25;122:22 required (4) 46:1;85:1;133:14;138:2 requirement (8) 45:10;48:1;51:5;93:13; 133:10,10,18;143:12	requirements (4) 25:18;43:3;45:15;54:16 reread (1) 121:4 research (1) 171:20 residential (5) 42:18;71:8;72:4,11;152:17 residential (1) 72:18 resist (1) 180:8 resolving (1) 78:10 resource (2) 127:21;157:15 Resources (9) 18:20;19:1,6;21:8;68:1; 82:7;141:21;164:16;171:20 respect (1) 201:8 respond (1) 30:10 responding (1) 34:25 responds (1) 34:11 response (8) 17:4,13;29:7,10,13,14; 30:7,24 responses (1) 200:22 responsibilities (1) 169:25 responsibility (1) 205:14 restate (2) 45:7;120:21 result (11) 89:11;92:14;106:24; 111:15;116:24;122:14; 134:16;142:25;179:15; 184:12;200:19 resulted (3) 48:23;177:8;179:21 results (5) 40:9;48:5;88:4;95:25;96:5 retain (1) 43:3 returned (1) 46:23 returns (1) 46:25 review (8) 11:16;36:20;100:20; 117:8;153:23;175:21;182:2; 198:20 reviewed (4) 43:9;196:11;197:1,2 reviewing (1) 78:20 revisit (1) 183:1
--	--	--	--

<p>right (90) 14:7;15:4;26:17;34:16; 35:18,20;37:22;39:18;53:16; 55:12;57:5;70:13;71:10; 73:1;76:2,16,17;78:10;79:5; 81:5;83:3,4;89:16;91:17,18; 95:7,18;98:12;105:25;106:7; 108:21,22;109:2,9;110:15; 114:11;115:18,23;116:9,10; 118:12;119:12;120:14; 121:23,24;122:6,7,8;123:18; 124:10;125:4;126:11,12,19; 128:22;129:3,10,25;130:8, 15;131:10,13,24;133:15; 136:4;137:20;139:21; 140:18;157:24;162:12; 164:23;166:4,11;167:21; 170:25;178:5;179:16;182:3; 185:17;188:22;192:7;195:4; 196:4;200:14;202:4,7,9; 203:2;206:1,25</p> <p>rightly (2) 40:11,12</p> <p>rights (45) 13:3,4,8;15:7,17,20;16:1; 19:14,22;20:2,6,7,13;22:16; 23:23;25:22;26:2,5;27:22; 28:13;29:1,2,12;31:6,7,14, 18;33:4;55:17;58:2;61:11; 69:3,6;78:22;80:20;81:2; 118:21;122:1;153:15; 154:21;160:9,20;162:6; 195:22;203:11</p> <p>ring (1) 188:7</p> <p>River (15) 41:23;46:21;48:17;52:7; 66:18,21;75:2;78:11;139:12, 25;160:14;186:21;187:4; 201:25;202:6</p> <p>roads (13) 61:14,14,17,20;62:20; 64:8;74:9;101:7,8;106:5; 153:2,9;154:4</p> <p>roadway (4) 151:19,24,25;152:1</p> <p>roadways (4) 38:16;40:10,12;61:20</p> <p>Rob (11) 102:12,24;103:2;105:2; 112:5;114:17;116:7;120:12; 123:7;138:16,23</p> <p>role (1) 171:17</p> <p>rotation (5) 42:23;70:9;72:20;73:22; 189:7</p> <p>rough (2) 63:23;80:22</p> <p>roughly (9) 15:13;45:20,20;131:3,10, 18,23;135:4;146:6</p> <p>round (1)</p>	<p>131:5</p> <p>rule (2) 152:15;169:3</p> <p>ruled (1) 168:1</p> <p>rules (2) 161:11;203:18</p> <p>ruling (2) 77:14,20</p> <p>Run (2) 73:19;95:21</p> <p>runoff (4) 89:12;90:11,16,18</p> <p>rural (5) 42:8;60:24;99:18;100:24; 101:13</p> <p style="text-align: center;">S</p> <p>safeguards (1) 205:24</p> <p>safety (6) 126:10,17,23;127:2,6; 202:19</p> <p>same (24) 42:12,14,22;47:24;66:10; 67:2;89:7;93:9;101:1; 118:14;125:3,5,9;127:17; 136:16;139:24;174:14; 181:20;183:3;187:1,4; 192:20,20,22</p> <p>Sarah (4) 10:24;11:4,8;196:18</p> <p>sat (2) 182:14,15</p> <p>satellite (4) 59:18,19;78:20;149:13</p> <p>satisfaction (1) 76:22</p> <p>save (1) 162:22</p> <p>saved (4) 90:4,10,17;133:6</p> <p>saying (16) 28:12;31:15,17;72:25; 88:12;90:15;107:14;109:23; 110:12;114:20;168:10,12; 173:10;190:23;191:1,3</p> <p>scalpel (1) 64:2</p> <p>scenario (3) 72:21;73:19;75:5</p> <p>science (5) 104:11,15,19;109:14; 191:2</p> <p>scope (5) 79:2,7;182:22;183:12; 197:9</p> <p>Scott (4) 12:8,12;14:13,17</p> <p>S-c-o-t-t (1) 14:17</p> <p>scrutiny (1)</p>	<p>68:15</p> <p>season (7) 18:9;22:2;48:11;49:20; 161:25;190:25;204:5</p> <p>seasonal (1) 116:21</p> <p>seasons (1) 178:2</p> <p>seat (2) 98:10;184:2</p> <p>seated (4) 12:17;26:25;141:10;171:1</p> <p>second (11) 48:2;53:19;56:18;58:13; 110:2;125:15;126:13;148:3; 161:17;175:21;176:25</p> <p>section (16) 39:16;40:7;43:11;45:1; 53:20;54:13;58:14,16;85:17; 95:6;103:14,15;105:12; 121:14;152:11;163:2</p> <p>sections (3) 103:8,10,11</p> <p>seed (1) 162:1</p> <p>seem (1) 164:19</p> <p>seems (2) 170:18;204:8</p> <p>seep (1) 49:3</p> <p>seepage (5) 45:23;49:16;88:1;91:1; 135:12</p> <p>seeps (1) 48:25</p> <p>select (1) 95:18</p> <p>selected (3) 44:13;55:6;122:25</p> <p>selection (5) 51:22;54:15,16;97:13; 110:17</p> <p>self-interest (1) 63:20</p> <p>sell (3) 73:7,10,12</p> <p>semirural (1) 42:8</p> <p>send (2) 11:8;17:25</p> <p>senior (14) 20:2;26:4;31:8,10,16; 55:12,17;126:10;160:20; 202:4,7;203:2,21,25</p> <p>seniors (1) 202:12</p> <p>sent (4) 17:21;18:16;30:5;197:24</p> <p>sentence (17) 76:10;85:23;116:19;157:9, 25;159:12,12;161:17; 172:10,22;173:1,9;174:20;</p>	<p>175:2;176:14;177:1,3</p> <p>sentences (1) 23:14</p> <p>series (1) 68:19</p> <p>serve (3) 15:8;46:13;128:4</p> <p>served (1) 52:23</p> <p>service (21) 39:1;52:20,21,23;60:4; 61:11;62:9;70:12;74:24; 80:6;86:20;118:22;121:1,9, 17;150:5;152:12;153:1,16, 19;188:17</p> <p>set (9) 34:4;37:11;52:3;93:21; 95:10;127:11;128:15; 129:17;138:1</p> <p>settlement (14) 65:22;167:20,22,25;168:1, 5,13,22,22,23,25;169:20; 174:21,22</p> <p>several (2) 49:15;180:10</p> <p>shaking (1) 194:24</p> <p>shape (4) 118:11;150:21;163:18; 164:23</p> <p>shaped (1) 101:3</p> <p>shapefile (45) 37:24;38:3,5,5;39:13,16, 18;40:1,5;58:25;59:4,12,21; 60:10,14,18;63:24,25;64:7, 17;65:7,15,19;67:13,24; 107:17;148:18,22;150:14, 16;151:6;152:8,11,16; 153:18,20;155:5;163:11,13, 14,23;164:17;193:25;194:1, 4</p> <p>shapefiles (15) 37:14,24;38:1,9;40:3; 79:13;107:21;108:14; 111:12;118:2,7,8,24;154:12; 192:3</p> <p>shapes (1) 119:7</p> <p>share (3) 42:12;82:22;161:20</p> <p>shareholder (2) 75:7;88:25</p> <p>shareholders (1) 162:15</p> <p>shares (20) 72:15;73:5,7,10,12,18,24; 74:2,5,18,20;75:7,10;80:8; 85:22;89:7;100:5;161:19; 190:15,18</p> <p>Shaw (19) 36:16;59:2;60:19;103:14; 140:25;141:1,4,19;146:23;</p>
---	--	--	--

147:1,5;156:3,9;157:25; 160:3;161:24;163:3;165:8; 186:12 S-h-a-w (1) 141:19 Shaw's (3) 170:11;187:17;193:2 shed (1) 60:20 shift (1) 40:8 shifting (1) 33:25 shop (1) 163:17 short (4) 33:3;72:19;114:17;162:20 shortage (3) 127:7,8,15 shortages (1) 85:25 shorter (4) 42:21;72:8;95:16,21 shortfall (3) 177:9;179:15,21 shortfalls (1) 16:15 short-term (1) 116:22 shoulder (1) 116:22 shoulders (1) 49:11 show (24) 15:16;28:25;44:16,18; 66:12;95:17,22,24;96:11,20; 106:15;111:5,6;118:6,11; 119:8;136:17;157:3,5,14; 158:19,24;167:12;168:24 showed (3) 92:10;140:4;181:3 showing (5) 60:5;62:8;63:20;136:13; 176:17 shown (7) 62:15;95:13;115:1;150:7, 8;151:6,7 shows (16) 38:24;43:15,21;60:9,10; 93:4;94:3;145:13;150:6; 151:12;152:7;159:14;173:6; 174:23;178:3;192:7 shut (1) 161:8 side (14) 39:18;40:16,18;41:8; 42:24;86:3,5;139:5,8; 151:10;174:2,25;180:14; 181:21 sidewalks (1) 106:6 signal (1) 35:14	signature (1) 140:4 significant (7) 43:20;45:22;95:9;112:8; 132:3;145:16;146:4 Sigstedt (9) 171:25;173:9;175:2,22; 179:13;180:11;181:2; 197:23;198:18 Sigstedt's (5) 172:2;173:17;179:9,14; 180:17 Similar (5) 175:3;186:19;191:23; 198:3,6 Similarly (4) 49:16,20;53:19;127:13 simple (2) 50:8;115:11 simplistic (1) 49:7 simply (9) 39:15;46:20;51:22,25; 54:1;91:19;110:16;157:6; 169:23 SIMPSON (6) 24:16,19;56:13,14;185:13; 196:2 simultaneous (1) 200:22 situation (2) 47:23;140:21 situations (1) 120:4 Six (1) 179:22 size (1) 109:6 slated (2) 87:21;165:19 slight (1) 145:14 slightly (1) 112:7 sliver (3) 151:15,22,23 Slow (3) 14:23;32:9;37:21 slowly (1) 184:24 slow-moving (1) 129:22 small (8) 29:1;39:18;42:18;72:11, 18;146:1,4,6 smaller (1) 64:10 Snake (11) 15:8;27:22;41:23;75:2; 78:11;139:12,25;174:24; 186:21;201:25;202:6 snapshots (2) 191:8,16	snippet (2) 39:16,25 software (1) 108:12 soil (1) 70:9 sole (1) 63:15 solely (4) 60:13;67:13;69:14;80:14 solution (1) 164:18 somebody (5) 83:1;90:20;134:22,25; 154:23 somehow (4) 53:9;124:13;133:25; 190:23 someone (2) 33:4;190:24 Sometime (1) 17:11 sometimes (8) 53:12;70:5,8;88:14;89:15; 100:3,4;162:6 somewhat (6) 63:8;77:25;78:19;83:13; 134:9;154:19 somewhere (3) 48:17;75:8;198:24 sooner (1) 182:6 Sophia (4) 171:25;180:11;181:11; 198:18 Sophia's (1) 197:21 Sorry (29) 11:24,24;14:6,25;23:4; 32:11;44:7;50:5;51:24; 55:25;66:20;70:19;73:19,20; 79:21;81:13;84:14;88:9; 90:6;99:25;100:18;108:24; 120:21;161:16;164:3; 172:15;177:5;188:23;190:7 sort (2) 133:6;145:22 source (3) 120:7,24;121:22 southeast (1) 41:7 southern (2) 135:15;138:20 Southwest (11) 17:19,22;18:1,5,16,21; 19:2,15,18,21,24 speak (1) 44:7 speaking (1) 57:24 specialist (1) 108:20 specific (1)	134:7 specifically (1) 138:21 specifics (1) 117:21 spell (5) 14:15;27:7;35:22;141:16; 171:13 spells (1) 45:12 spend (1) 206:20 SPF (5) 14:21,22;15:1,2,5 spill (9) 46:6,10,13;48:1;115:17; 127:25;128:1,3;129:2 spills (4) 91:2;116:17;128:8,13 spoke (1) 92:11 spoken (1) 184:11 spot (1) 142:4 spreadsheet (2) 51:17;134:13 spring (3) 25:6,15;46:2 springs (1) 48:25 sprinkler (18) 47:5,9,12,19;48:5;49:8; 72:12;88:19;89:1,12;90:3,8, 21;91:2;92:20;115:25; 128:20,25 sprinklers (1) 158:23 Spronk (1) 102:20 square (1) 61:19 SRBA (1) 79:1 stab (1) 59:10 stable (1) 93:18 staff (4) 63:3,14,19;169:6 stand (3) 34:15;183:25;186:9 stand-alone (1) 53:7 standard (8) 76:19;77:12,18;104:24,24; 127:3;202:15,17 standards (4) 76:22;129:19;130:10; 204:14 standpoint (3) 74:17;104:18;111:15 start (13)
---	---	--	---

16:17,20;34:10;41:1; 45:19;52:14;77:7,17,17; 82:17;99:12;100:1;195:3 started (5) 14:7;15:14;28:2;140:2; 182:6 starting (6) 95:18;119:14;122:2,4; 144:16;174:21 starts (2) 172:23;176:15 startup (1) 46:3 state (13) 14:15;27:7;35:21;95:8; 126:7,16;127:24;128:18; 129:7;130:11;141:16; 171:13;205:20 stated (3) 45:8;131:6;200:16 statement (8) 28:8;47:14;51:19;70:15; 79:10;92:4;94:7;96:25 statements (1) 158:16 states (3) 19:20;85:20;112:14 static (1) 124:14 stating (1) 30:24 statistical (2) 43:11,16 statistically (3) 43:20;95:9;112:8 status (1) 74:6 stay (4) 42:22;129:1,1;131:20 stayed (3) 22:25;24:1;66:9 steady (1) 205:20 Step (2) 85:2;86:16 steps (1) 103:24 still (8) 10:12;24:5;41:22;49:21; 102:9;126:23;134:24;160:3 stipulate (3) 10:14;12:25;13:11 stipulated (8) 13:14,22;28:5,8;124:23; 125:18;147:5;199:9 stipulating (1) 184:14 stipulation (12) 13:15,16;56:7;125:6; 184:7;185:9;195:16,25; 196:19;197:11;199:2,14 stockholders (1) 73:7	storage (3) 48:9;66:1,14 streams (1) 48:25 stretch (1) 88:15 stricken (1) 168:3 strict (2) 42:23;72:20 strictly (2) 72:17;155:6 strike (2) 76:25;167:19 striking (1) 77:7 string (3) 168:15,17;169:22 strip (6) 74:25;75:3,11,13,16,20 strong (1) 44:13 structure (1) 47:20 subdivision (11) 42:25;61:14;71:13;72:4,7; 101:7,8,12;152:7;153:3; 154:4 subdivisions (5) 42:8,11;71:8;152:25;153:6 subject (9) 22:6,7;24:6;29:2;43:18; 68:15;73:13;122:5;139:23 subjects (3) 55:24;56:4;147:2 submit (3) 21:25;25:17;85:1 submitted (4) 13:7;22:5;77:5;148:7 submitting (1) 25:15 subsequent (1) 112:16 substantial (1) 92:20 subsurface (1) 48:9 subtract (2) 174:6;177:25 subtracted (2) 174:9,14 subtraction (3) 173:25;175:25;176:1 successive (1) 23:17 sufficient (2) 18:4;73:24 sufficiently (1) 59:6 SUGAR (8) 8:16;26:13,20;27:14,18; 28:4,14;71:25 Sugar's (1)	27:21 suggest (3) 127:19;206:8,16 suggested (1) 206:9 suggesting (1) 181:11 suggestions (1) 163:3 suggests (2) 168:18,20 Sullivan (4) 102:20;143:1,11;198:7 Sullivan's (1) 113:6 summaries (1) 195:21 summarize (2) 37:5;133:7 summarizes (1) 113:17 summary (3) 133:3;134:20;163:6 supplemental (24) 52:16,18,24;53:4;80:1,5, 10,19;81:23,25;82:15;85:15; 86:2,9;117:23;120:17,23; 121:11,21;122:3;153:15; 154:9,24;204:1 supplied (2) 53:22;169:14 supply (20) 44:23;52:25;53:5,9;58:2; 69:20;80:7;85:20,24;86:12; 120:19,25;121:16,22;127:3; 136:9;161:8;178:1,1;202:1 suppose (1) 32:2 sure (26) 33:17;56:16;59:10;60:6; 63:16;64:3;68:2;71:1;82:23; 84:5;96:24;100:3;110:10; 114:9,11;131:15;136:10; 153:6,25;158:11;159:3; 167:3;170:7;171:15;175:18; 179:11 Surface (43) 13:21;16:16;21:9;22:17; 23:21;26:3,4;33:25;34:20; 36:5;41:18;43:3;52:18,19, 25;53:8,24;55:12;56:25; 65:23;66:2;80:8,14;81:10; 82:3;84:9,25;85:22;86:8,11; 91:16;100:5;140:24;141:5; 160:10,15;163:9;184:4,11; 189:17;199:9;200:9;201:25 suspect (1) 204:19 sustain (1) 71:3 sustained (4) 47:1;48:10;182:23;183:4 sustaining (1)	183:9 SWC (5) 7:15;23:21;121:10; 169:18;185:14 swear (1) 34:13 switched (1) 198:23 switching (1) 198:23 sworn (8) 12:13;26:21;34:21;141:6; 170:24;171:5;184:2;186:4 system (41) 45:22;46:2,8,9,12,14; 47:14,15,18,21;48:4;49:12, 14,22,23;53:17;59:24;64:23; 69:11;72:12;89:19,22,25; 90:3,4,9,10,11;105:20; 111:12;119:22,24;127:10; 128:5;129:16,22;139:9,11; 145:2;146:17,21 systems (16) 50:12;53:5,7,9,11;72:11; 128:1;133:8;135:15;138:25; 139:7;146:10,13;161:2,5,7
T			
		tab (1) 173:20 table (8) 49:3;113:8,15;115:1; 178:3,22;179:1,2 tag (1) 119:3 tail (5) 46:9,13;49:23,24;128:4 tailwater (1) 139:11 talk (8) 11:22;73:4;110:4;200:14; 201:3,16;204:19;206:18 talked (9) 47:5;92:19;135:21; 136:12;143:7;182:11;184:4; 191:11;198:25 Talking (10) 32:18;69:13,13;75:10; 94:14;134:7;151:4;158:2; 159:3;204:9 talks (3) 52:16;54:14;83:24 task (2) 16:17;117:13 tasked (2) 16:10,13 tax (1) 119:7 technical (16) 16:13;36:21;54:19;67:19; 104:18;111:15;127:22; 144:6;175:16,17,23;176:3;	

186:18;196:21;197:3,6 technically (2) 188:9;189:10 technology (2) 109:6;130:13 ten (4) 15:13,13;23:18;147:20 tend (1) 49:12 tender (2) 56:2;146:23 tendered (1) 55:23 tens (1) 132:4 term (3) 32:7;129:12,18 terms (9) 31:24;41:16;60:17;74:13; 105:23;108:10;119:6; 201:18;205:3 test (1) 145:15 testified (19) 12:14;26:22;34:22;69:21; 87:6;88:25;89:18;90:25; 91:5;95:15;118:1;141:7; 146:24;147:3;157:18;159:6; 171:6,12;186:5 testifies (1) 170:14 testify (5) 46:7;103:9;158:12; 165:12;167:8 testifying (2) 59:7;74:7 TESTIMONY (46) 7:4,8;11:20;47:8;63:6,11; 64:20;65:6,13;66:17;67:20; 71:23;72:6;75:14;76:25; 78:13;86:14,18,22;87:9; 88:23;91:3,18;92:25;94:2; 107:1;109:22;111:22;113:3; 115:24;133:12;135:2; 138:24;139:17;170:11; 171:24;173:17;175:11; 186:12;189:20;192:6,10; 193:2;197:21;201:6;202:21 TFCC (5) 58:14;148:1,12;157:12; 187:19 thanks (11) 11:3;34:24;78:8;97:25; 98:1;111:23;124:19;127:1, 19;156:1;207:1 theme (1) 205:5 Theoretically (1) 134:5 theory (1) 51:14 therefore (1) 49:19	thin (1) 40:20 thinking (3) 161:5;204:10;206:23 third (2) 68:8;145:10 THOMPSON (62) 10:7,8,10;11:25;24:17,20, 23;25:1;26:7;34:2,11,13; 35:1,4,18,19,21;38:18;41:7; 44:8;54:10;55:21;56:3,15, 22,23;70:14,19,22;71:3; 78:23;83:18;94:1;98:13; 102:24;132:11,12,13,16,21; 134:24;138:6;139:14; 140:24;141:11,12,15; 142:17;146:22;147:2,7,8; 160:25;165:6,7;184:19,21; 199:7,8;206:3,4,6 Thompson's (1) 138:18 though (8) 35:8;42:14;105:21; 128:20;163:8;164:5,24; 192:9 thought (2) 10:11;143:3 thoughts (1) 195:7 thousand (1) 117:5 thousands (1) 132:4 three (13) 13:7;23:13;37:13;103:5,7, 10,19;136:18;144:16; 156:17;179:1;195:16,24 three-page (1) 21:13 three-year (1) 157:3 throughout (1) 20:10 tidy (2) 133:5;134:19 tiles (2) 49:2,3 timely (1) 205:3 times (7) 45:10;51:5;72:16;93:13; 133:18;143:8;158:13 timing (2) 25:5;72:6 Titled (1) 148:12 TJ (18) 57:20;63:18;65:11;73:19; 78:3;79:16;80:16;81:24; 88:9;96:25;98:1,13;100:12; 110:22;147:15,19,22;153:4 today (17) 10:25;11:1;59:7;64:16;	65:6;83:18;84:22;96:8; 102:14;114:18;116:1;130:8; 140:19;148:15;200:25; 201:12,20 today's (1) 14:19 together (5) 25:23;33:10;78:15;97:3; 144:11 told (2) 202:16;204:13 took (5) 61:10,13;94:24;144:16; 163:16 top (5) 85:19;148:9;150:18; 157:8;172:8 topics (2) 166:16;167:25 total (6) 45:25;88:4;189:2;192:11, 24;203:25 totally (1) 179:11 toward (1) 45:16 towards (1) 22:22 track (1) 196:18 tracks (1) 119:24 tract (8) 48:19;49:6;71:24;72:3; 74:23;86:2,3,4 trained (1) 109:1 transfers (3) 108:16;120:4;160:10 transient (1) 205:21 translate (1) 47:16 Travis (9) 10:8;25:1;35:7;42:2; 44:10;70:17;111:8;132:13, 14 treat (2) 76:5;188:13 treated (1) 48:12 trend (21) 43:16,17,20,22;44:11,14, 16,18;95:9,10,11,17,20;96:9; 106:15;112:1,7;136:12,13, 21;143:2 trends (3) 135:22;144:11;145:13 tried (5) 46:21,21;149:6;152:19; 181:12 trouble (1) 41:2	true (18) 51:11;52:1;67:1;88:17; 89:3;92:3;122:10;128:7; 130:17,23;131:2;134:8; 145:2;156:23;176:6;179:13; 181:20;188:7 truth (7) 12:14;26:21;34:21;53:17; 141:6;171:5;186:4 truthing (1) 122:5 try (7) 37:3;133:5,7;169:9; 185:22;205:4;206:19 trying (13) 17:7;29:25;143:2;167:24; 169:6;185:7;188:15,16,17, 23;191:13;204:11;206:24 TSCHOHL (2) 11:12;35:14 Tuesday (2) 10:11;180:6 turn (35) 19:7;21:11;22:10;38:18; 39:7;40:16;41:25;43:7; 44:25;46:19;52:9;55:18; 58:9,12;59:14;62:7;73:3; 79:24;83:17;93:23;105:11; 111:25;115:5,9;142:17; 147:24;150:2;172:4;176:8, 21;177:11,14;178:12; 187:14;205:18 turned (1) 49:13 TWG (1) 144:8 twice (1) 71:23 Twin (99) 37:8;38:6;39:1;43:2,5,12; 44:19;45:5;47:7,9;48:3,4,19; 49:6;52:21,22;57:21;58:22; 60:3;61:3,25;62:4,9;65:8,18; 66:4,8,11,15;67:8,13;68:10; 69:2,7;70:1,12;71:9,24; 72:15;73:6;78:10,22;79:15; 80:6,19;81:20;82:5,25; 85:24;86:2;88:19;92:1,5; 93:1,16;94:3;99:9;105:12; 110:24;112:1;113:19; 114:14;116:1,4;117:15; 118:22;120:25;122:10,16; 130:17;131:2;135:3,23; 139:9;145:8,11,18,25; 146:16;148:18;149:3;150:5; 153:5;155:3,6,16;157:12,18; 158:16;159:16,21;161:1; 163:10,12,19,21;176:17; 179:2;190:12 Two (17) 11:25,25;12:1,1;23:17; 38:9;47:18;64:8;71:10;96:8; 159:23;166:14,19;172:18;
--	--	---	---

<p>174:3,10;195:6 twofold (1) 107:13 type (6) 57:24;83:1;85:11;145:23; 149:17;181:12 types (4) 69:13;86:19;88:15;182:7 typical (2) 72:11;162:5 typically (14) 42:8;45:22;71:20;72:8; 86:11,25;87:25;89:14;99:19, 21;139:20;161:24;162:3; 200:5 typo (2) 197:22,23</p>	<p>93:4;94:20;96:22,23;97:10, 11,17,18;98:11;102:23; 103:1;108:22,24;111:5,6; 114:20;124:6,6;126:24; 127:16,21;133:5;138:17; 147:19;151:12;158:24; 162:18;167:24;175:14; 176:24,24;186:9;187:9,16; 192:7;193:20 upcoming (1) 87:20 update (4) 104:7;109:12,14;164:16 updated (8) 107:18;160:10;197:24; 198:1,2,7,10,17 updates (1) 178:9 updating (1) 171:21 upfront (1) 122:23 Upon (5) 23:16;48:7;137:8;200:5; 202:1 upper (1) 146:5 upper-right-hand (2) 99:13,13 upward (2) 44:16;95:17 urgency (2) 168:19;200:18 USA (1) 8:10 usage (7) 32:7;52:17,17;53:4,16; 85:15;117:24 use (52) 16:14;32:3;33:2;41:15,22; 42:16,20,23;43:4;44:15,17; 63:4;67:9;72:7;74:2;80:1,10; 81:6,23;82:1,15;84:16;85:2; 99:22;100:5;104:25;106:16; 118:5;120:17,23;122:1; 143:14;144:2;145:3;150:12; 154:9;157:14;160:10;162:5, 12;163:4,11;164:20,21; 175:19;177:22;188:15; 192:10,13;197:8;202:11; 204:1 used (52) 15:24;44:20;51:3,7;53:11; 55:16;58:19;59:20;63:9; 66:6;67:2,5;69:10;70:9; 76:12;77:24;79:13;80:5; 93:2;96:7;97:2,3,20;108:16; 119:15;120:3;122:3;129:19, 19;133:20;134:3,10,15; 139:24;143:10,18,24; 144:18;148:18;149:25; 157:21;159:9;164:15; 168:13,25;178:4;179:5,19,</p>	<p>19;190:15;193:25;194:7 useful (1) 182:17 user (4) 74:19;81:14;162:18,19 users (16) 24:13;46:8;61:8;68:5; 75:15;77:5,11;82:10,13; 98:3;122:23;127:13;128:1; 155:12;180:1;204:3 user's (1) 74:18 uses (7) 15:17,18;84:8;91:19; 104:14;143:17;150:6 using (18) 93:1;99:21;100:2,15; 104:24;108:21;117:1; 126:16;127:3;145:4;156:16, 20;160:19;163:14,22;164:1; 191:25;192:3 usually (3) 42:17;53:9;74:21 utilize (1) 61:22 utilized (6) 37:9;54:3;73:15;110:6,7; 119:7 utilizes (2) 73:21;118:4</p>	<p>70:20 volume (13) 12:23;55:3;91:20,22; 92:10,14,15;93:8,9,15,18; 114:10;126:8 volumes (4) 107:3,3;138:25;176:17</p>
U			W
<p>uncertainties (3) 202:21,22;203:5 uncertainty (2) 203:10,12 unclear (2) 160:18;190:7 under (25) 16:4;21:17;25:12;29:16; 30:4,18;74:5;78:22;89:12; 109:21;117:23;121:14,15, 15;122:17,24;150:8;152:8; 161:11;176:18;177:7;178:3; 187:19;192:19;203:17 underestimated (1) 50:3 underlined (1) 22:23 underlying (7) 74:6;104:11,15,20;105:1; 189:5;190:17 understands (1) 19:13 understood (6) 78:13;91:18;92:25;94:2, 23;155:15 Unfortunately (1) 157:5 unique (1) 48:2 Unit (2) 160:11,16 unless (3) 72:20;100:14;188:19 unlikely (1) 22:3 unreasonable (2) 117:5;128:19 unused (2) 16:1,7 up (50) 10:16;34:4;36:25;46:24; 48:16,22;52:3;69:22;70:2; 71:13;72:21;73:1;92:10,12;</p>		<p style="text-align: center;">V</p> <p>valid (3) 20:6;51:25;54:6 Valley (15) 29:15,22;30:1,6,8,15,18, 25;31:3;33:7,9,13;173:5; 175:6,13 value (2) 94:21;112:6 values (5) 111:1;117:18;143:11; 178:11,20 variability (1) 95:4 variation (1) 46:22 variations (3) 46:11,15;128:2 varies (1) 45:23 vary (2) 137:8,12 vegetation (2) 41:18;139:20 verification (1) 61:8 version (2) 101:4;198:1 versus (2) 63:24;150:8 voice (1)</p>	<p>wait (6) 13:2;44:2,2;66:20;162:9; 170:13 walk (1) 37:3 warm (1) 46:23 waste (5) 41:3;89:15,19;127:21; 129:20 wastewater (2) 89:11,14 WATER (236) 8:4;13:2,4,7,21;14:21; 15:1,4,16,20;16:1,5,14,16; 18:20;19:1,5,14;20:2,6,7,9, 13;21:8,9;22:17;23:21;26:2, 3,5;28:13,25;29:12,15,22; 30:6,8,15,18;31:1,3,6,7,14, 18,20;32:3,5,7;33:1,4,7,13, 25;34:20;36:5;41:17,23; 42:20;43:4,12,13,14;44:23; 45:9,15;46:8;48:10,11,12,16; 49:3,4,13,13,18,21,21,22; 52:6,18,19,25;53:8,24;55:12, 17,17;56:25;58:2,2;61:4,8; 65:23;66:2,2,8;68:1;69:3,7, 19,23;70:3;71:24;72:7,25; 74:5,14,14;75:1,2,13,16,22; 78:10,22;79:5;80:7,8,14; 81:10,14,17,21;82:3,7;84:8, 9;85:1,20,22,24;86:8,12; 87:3;88:3,5,16;89:2,6;91:11, 16,20,21;93:2,12;96:14,22; 97:4;99:8;100:5,14,15; 102:20;104:11,15,20,25; 105:16,24;107:5;108:16; 109:18;116:23;119:21; 120:18,25;121:16;122:23; 126:10;127:14;128:1;131:9, 16,20;140:24;141:5;143:8, 10,14,15,24;144:12,19; 145:23;146:18;153:19,20; 154:21;157:14;160:1,9,10, 15;161:8;162:12,18,19,22, 24;163:3,5,9;164:9,12,14; 171:19;173:5,21;174:3,12, 14;175:13;184:4,11;186:3, 25;189:17;195:22;199:9; 200:9;201:8;202:1,1,4,4,7,9, 11;203:2,11;204:16,16; 205:3,3,24 water-intensive (2)</p>

158:24;159:17 waterways (9) 38:10;39:21;41:14;48:23; 68:25;69:8,13;105:19; 109:19 way (15) 30:3;52:4;64:4;65:25; 81:22;88:11,12;90:15; 100:25;101:15;124:16; 134:6;161:18;173:24;204:24 ways (2) 54:25;88:10 weak (2) 35:15;95:10 wearing (1) 12:2 weather (3) 46:23;116:22,23 Weaver (2) 166:13;167:6 website (1) 108:19 week (4) 86:15;145:19;200:20,25 weeks (2) 23:18;47:1 welcome (2) 186:9;206:2 well-managed (2) 146:19;161:1 wells (8) 52:17,24;80:5;86:9;99:19, 22;118:16,17 weren't (1) 25:25 west (1) 40:17 wetting (2) 46:1;91:1 What's (11) 33:12;36:4;78:1;89:15; 100:18;141:24;169:22; 179:24;184:11;198:4;205:4 wheat (4) 86:21,24;146:2;162:21 wheeled (4) 43:13,25;44:5;173:21 whereas (2) 64:1;118:19 whole (5) 43:24;44:4;65:4;73:18; 153:5 whose (1) 130:2 winter (3) 144:8;162:16,21 withdraw (1) 199:24 withdrawing (1) 200:10 within (38) 18:17;46:8;52:19,20;53:1; 54:23;61:11;68:21;70:1,12;	73:8;80:5,13,18;82:15; 85:12;86:19;87:3;88:19; 94:8;96:4,21;118:22;119:15; 120:25;121:9,16,23;128:1; 138:1;145:23;153:1,15; 154:25;155:23;160:5; 200:20;204:15 without (6) 20:9;21:18;81:3,20; 126:17;128:3 witness (52) 11:23;12:4,18;14:25;23:5; 26:12;27:10;32:11;33:23,24; 35:18;36:10;37:19,22;41:3; 44:6;52:16;57:11;66:23; 67:1,17;70:15;82:19;86:5; 96:2;98:1;100:2;103:1; 113:15;123:7;132:14,18; 138:9;140:10,20,23;142:5, 14;162:11;165:9,10;166:13, 24;167:7;169:10;170:25; 171:4;183:14;185:6;186:2; 187:13;189:17 witnesses (7) 10:10;34:1;165:19;166:3; 170:9;194:23;201:7 witness's (1) 76:24 WMIS (5) 119:3,18;121:25;154:15, 18 wonder (2) 98:16;102:22 Wood (12) 7:5;11:4,8;171:9;172:16, 22;179:23;180:13;182:21; 183:3,18;187:11 word (3) 10:23;96:2;126:24 words (2) 198:23;203:16 work (29) 18:2;20:18;27:19;35:25; 36:8;57:24;58:1;61:23; 79:17;81:8,13,17;138:1; 139:4;141:20,21;142:3,21; 144:6;149:2;169:7,7,24; 170:18;171:16,19;186:18; 187:3;201:9 worked (9) 15:3;27:17;29:11;57:21; 78:15;153:22;154:11,15; 186:25 working (15) 11:10;15:14;16:17,20,22; 54:19;78:21;153:22;175:16, 17,23;176:3;196:21;197:3,6 works (2) 36:15;170:17 worksheet (1) 144:7 wrestle (2) 187:1,4	wrong (3) 13:4;133:25;134:2 wrote (1) 103:10 Y yard (2) 99:14,22 y-axes (1) 159:23 year (96) 15:2;16:19,21;25:24; 36:24;51:21,23;54:14,16; 55:5,9,9,16,17;70:11,24; 73:17,18,23,25;97:7,10,12, 14,18,19,21;107:25;110:13, 15;112:15;114:7;122:9,13, 25;126:8,22;130:7,18,21,24; 133:16,21,22;134:4,7,18; 137:15;144:13,20,22,24; 145:3;146:1,3;156:21;157:4; 161:8;162:20,25;164:13,13, 17;174:16;175:15,20; 176:12,19,20;177:25; 178:10;188:20,25;189:4,5,9; 190:9,10,20,23;191:5,6,7,13, 13,15,18,20,23,24,24;192:8, 9,12,14;193:9 years (33) 15:13,13;27:18;43:14; 44:22;54:20;69:18;87:8; 95:13;112:16;122:12;136:6, 8,18,20;144:10,17;149:9,22, 23;156:17;157:1;164:8; 177:8,10;179:15,20;188:2, 17;192:1,4;205:9,18 year's (1) 164:10 yellow (16) 40:20;41:8;54:22;60:8,14; 150:15,17,19;151:3,5,10,13, 16,23,23;152:1 Yep (3) 140:22;172:9;181:10 yesterday (4) 171:25;173:17;175:12; 200:11 yield (1) 118:11 0 02-'04 (1) 178:2 06/08/12 (1) 176:19 1 1 (10) 22:18;43:13;59:17;68:25; 85:2;105:11;111:9;174:3,12;	193:9 1,000 (1) 135:4 1,045,120 (1) 113:24 1,098,477 (1) 114:3 1,100,000 (2) 131:3,8 1:00 (1) 123:12 10 (6) 106:9;121:5;157:8,25; 159:11,13 10,000 (3) 173:4;174:4,6 10:30 (1) 57:6 100 (4) 48:22;105:9;135:3;146:3 100,000 (2) 110:25;111:9 101 (1) 8:23 102 (1) 8:23 11 (4) 44:25;142:20;145:6;160:3 11th (1) 54:18 12 (2) 72:16;144:17 125 (1) 9:16 12th (1) 24:10 13 (3) 50:19;115:9;144:17 13970 (1) 13:5 14 (11) 7:22;8:11,12,13,14,15; 52:12;79:25;80:3;85:16; 144:17 15 (3) 57:3;115:17;195:5 15,000 (2) 174:9;185:6 15,000-acre (1) 111:11 150,000 (5) 94:9,14,18,19,22 16 (2) 172:5,20 16th (1) 201:1 17 (3) 38:11;39:17;40:4 171 (1) 7:5 18 (3) 72:13;178:8;205:10 180 (1)
--	--	--	---

7:6 185 (5) 8:5,6,7,8,9 186 (1) 7:9 19 (5) 83:22;107:11,24;177:7; 179:14 190 (1) 7:10 1910 (1) 130:7 193 (1) 7:11 194,000 (1) 164:2 194,732 (1) 194:2 194,732-acre (1) 58:20 1953 (11) 17:1,10;20:3;22:17;26:2; 29:5,9;31:10,14,18;32:13 196 (3) 7:23,24,25 197 (12) 9:5,6,7,8,9,10,11,12,13,14, 15,17 1970s (1) 94:5 1977 (3) 43:24;44:4;112:10 198 (1) 8:22 199 (2) 7:16;8:22 1990 (1) 44:17 1995 (1) 176:18 1999 (2) 112:17;136:2 1st (2) 24:8;127:8	112:20,22;113:24;114:24; 144:9 2000s (1) 95:17 2000-to-2014 (1) 144:15 2001 (1) 136:5 2004 (1) 15:2 2005 (4) 44:15,17;94:25;136:5 2007 (4) 143:18,19;145:9;159:15 2011 (7) 37:10,15;38:1;40:3;149:1, 8;150:1 2013 (40) 40:11;58:23;59:21;60:6, 10,13,17,22;63:23,25;64:7, 16;65:7,15,19;67:12,24; 148:18;149:1,8;150:7,13,16; 151:6,12,20;152:2,4,8,11,16; 153:18;154:6;155:5;163:18; 164:2,6,23,24;194:1 2014 (6) 15:15;16:11,11;113:24; 114:24;144:10 2015 (7) 65:22;114:3,19;115:2; 136:13;144:16,19 2015-to-2021 (1) 114:7 2016 (7) 104:8;109:13;114:13,14, 20,22;115:1 2017 (41) 37:11,15;38:1,2,4,12,25; 39:3,12;40:3,12,13;41:12; 42:6;60:6,9;62:16,23;63:24; 64:1,9,12,18,24;65:9,15; 99:11;150:9,21;151:1,4,7; 163:11,13,14,16,17,20,22,23; 164:6 2018 (16) 54:20,23;55:5;126:9,16; 130:18,21;156:24;172:11, 23;173:3;174:7;175:19; 176:12,20;177:25 2019 (3) 87:16;92:6;135:7 2020 (4) 54:20;94:25;136:17; 156:24 2021 (14) 39:6;43:14;44:1,6;114:3, 19,21,22;115:1,2;136:3,13; 137:18;156:24 2022 (10) 43:24;44:4;54:18;136:17; 145:9;164:25;176:18; 192:16,17,23 2023 (8)	21:10;22:18;109:13; 114:13;137:19;144:24; 192:15,21 2024 (2) 87:21;144:24 20s (1) 146:5 21 (2) 106:11,11 2-1 (4) 113:8,15;115:1;177:10 2-10 (2) 176:15,16 21st (1) 182:3 23 (6) 121:6;177:15,16,17,18; 178:23 25 (3) 73:22;88:21;92:21 2747 (1) 13:5 2748 (1) 13:5 2749 (1) 13:4 2758 (1) 13:5 28 (8) 8:17,18,19,20;176:8,10; 177:4,14 29 (3) 178:13,16,23	340 (1) 166:15 347A (2) 102:21;113:13 348 (5) 7:23;195:20,23;196:9,10 349 (4) 7:24;195:20,23;196:9 35 (3) 116:12;117:7;131:9 350 (5) 7:25;195:20,23;196:9,10 354 (1) 166:15 385,000 (2) 131:10,17
2			4
2 (20) 7:16;68:17,18;69:17; 72:14,14;76:8;77:1;99:3,11; 104:13;109:24;147:25; 148:9;161:14;187:15,23; 199:9,14,16 2.4.4 (1) 176:11 20 (12) 45:24;48:21;71:19;111:2; 115:16;146:2;172:4,5,6,17, 19;205:9 200,000 (1) 131:24 2000 (10) 43:14;44:1,6;94:25;96:7;			4 (27) 7:17;36:5,13;41:25;43:15; 55:22;56:9,10,12;58:10; 60:2;62:7,12,15;71:7;85:16; 93:25;98:23;102:19;103:5; 141:25;142:9,18;148:4; 187:10,11;199:10 4,000 (2) 174:23;175:22 40 (3) 146:1;162:21,24 40-acre (2) 71:12;72:3 42 (7) 115:18,21;116:9;117:3; 131:13,17,22 46 (1) 95:13
		3	5
		3 (6) 21:12;99:3;101:1,2; 109:24;112:14 3.2 (1) 72:14 3:36 (1) 207:6 30 (7) 27:18;45:24;48:22;146:6; 177:8;179:15,21 300 (4) 83:17;102:17;176:21; 177:12 30th (1) 22:17 31 (1) 173:5 316 (5) 124:24;125:1,7,10,20 317 (6) 7:22;12:23;13:13;14:2,9; 21:2 31st (6) 16:25;20:3;29:5,9;31:10; 32:13 337 (1) 84:21	5 (21) 7:18;38:19;39:8;51:12,13; 52:1,2;56:11;59:15;73:4; 98:23;109:24;135:18;150:2; 156:11,24;163:2;187:21,22, 22,23 5,000 (6) 173:4,6,12,23;174:16; 175:5 5,010,000 (1) 181:4 50 (7) 45:20;47:10;88:21;92:21; 111:4;115:25;146:7 50- (1) 95:2 50,000 (1) 114:7 502 (7) 8:5;184:6,9,17,25;185:18, 20 504 (7) 8:6;184:6,9,17,25;185:18,

<p>20 505 (6) 8:7;184:6,9,17,25;185:18 506 (7) 8:8;184:6,9,17,25;185:18, 20 515 (7) 8:9;184:6,9,18,25;185:18, 20 53 (1) 25:22 56 (5) 7:17,18,19,20;115:15 5th (2) 18:12;21:10</p>	<p>8</p> <p>80 (2) 45:21;162:20 837 (6) 172:4,5,16,19;176:9;198:9 837A (8) 8:22;198:3,5,11,13,16; 199:3,4 838 (8) 8:23;101:18,19,20,24; 102:1;136:25;139:15 84 (1) 126:9 84th (3) 55:6,13;126:22 85 (1) 45:21</p>		
<p>6</p>			
<p>6 (13) 7:19;39:7,10,12;42:1;43:7; 56:11;109:24;135:18;145:5; 159:14,19,19 60 (4) 47:10;88:21;92:21;115:25 600 (13) 8:11;13:1,2,9;14:3,5,7,7,9; 15:10,16,23;19:14 601 (5) 8:12;13:10,25;14:1;17:15 602 (4) 8:13;13:10;14:1;18:22 603 (4) 8:14;13:10;14:2;19:7 604 (6) 8:15;13:10;14:1,2,9;22:10 65 (1) 116:5 68 (6) 177:15,18,20;179:1,7,10</p>	<p>9</p> <p>9 (3) 83:21;107:10;156:15 9:00 (1) 10:3 900 (4) 9:5;196:22;197:13,17 901 (3) 9:6;196:22;197:13 902 (3) 9:7;196:22;197:13 903 (3) 9:8;196:22;197:13 904 (3) 9:9;196:23;197:13 905 (3) 9:10;196:23;197:13 906 (4) 9:11;196:23;197:13,17 908 (4) 9:12;196:23;197:13,17 909 (3) 9:13;196:23;197:13 90s (1) 57:23 910 (4) 9:14;196:23;197:14,17 912 (4) 9:15;196:23;197:14,17 914 (8) 9:16;125:3,5,7,19,21,22; 196:23 917,000 (1) 131:18 928 (4) 9:17;196:24;197:14,17 95th (1) 55:9 99th (1) 55:10</p>		
<p>7</p>			
<p>7 (13) 7:20;39:23,25;55:22;56:9, 11,12;74:3;93:23;142:18,20; 161:15,17 700 (6) 8:17;28:4,10,11,22;31:8 701 (4) 8:18;28:4,10;29:17 702 (5) 8:19;28:4,10;30:12,14 703 (5) 8:20;28:4,10,11;30:20 7130 (1) 13:4 75,000 (1) 95:2 78 (9) 178:12,14,15,16,18,19; 179:2,6,19</p>			