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BEFORE THE
ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN THE MATTER OF THE NAVIGABILITY)
OF THE GILA RIVER FROM THE NEW) NO. 03-007-NAV
MEXICO BORDER TO THE CONFLUENCE)
WITH THE COLORADO RIVER, GREENLEE,) ADMINISTRATIVE
GRAHAM, GILA, PINAL, MARICOPA AND) HEARING
YUMA COUNTIES, ARIZONA.)
_____)

At: Phoenix, Arizona
Date: June 16, 2014
Filed: July 11, 2014

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1 BE IT REMEMBERED that the above-entitled and
2 numbered matter came on regularly to be heard before the
3 Arizona Navigable Stream Adjudication Commission, State
4 Senate Building, Hearing Room 1, 1700 West Washington
5 Street, Phoenix, Arizona, commencing at 9:00 a.m. on the
6 16th day of June, 2014.

7

8 BEFORE: WADE NOBLE, Chairman
9 JIM HENNESSY, Vice Chairman
10 JIM HORTON, Commissioner
11 BILL ALLEN, Commissioner

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1 CHAIRMAN NOBLE: Good morning. We welcome you
2 to the Gila River hearing of the Navigable Stream
3 Adjudication Commission for the State of Arizona. The
4 meeting is hereby called to order.

5 We have present all of the Commissioners,
6 Director George Mehnert and our attorney Fred Breedlove.

7 Are there any questions or concerns regarding
8 the minutes of the meeting of May 1, 2014?

9 VICE CHAIRMAN HENNESS: I move the approval,
10 Mr. Chairman.

11 COMMISSIONER HORTON: Second.

12 CHAIRMAN NOBLE: And move the second that the
13 minutes of May 1, 2014 meeting be approved.

14 Any further discussion? All in favor, say
15 aye.

16 (A chorus of ayes.)

17 CHAIRMAN NOBLE: Any opposed?

18 The minutes are approved.

19 Next on the agenda is the hearing regarding
20 the Gila River. We have previously discussed with
21 counsel that we will begin with those who propose or
22 advocate that the Gila River was navigable at statehood,
23 and we are convened for the purpose of determining the
24 navigability or nonnavigability of the Gila River in its
25 ordinary and natural condition at the State of Arizona's

1 admission to the United States on February 14, 1912,
2 consistent with the Arizona Court of Appeals decision in
3 State versus Arizona Navigable Stream Adjudication
4 Commission and Segmentation of the Gila River,
5 consistent with the United States Supreme Court decision
6 in PPL Montana, LLC versus Montana.

7 Who is going to be taking off first here?

8 MR. KATZ: My name is Paul Katz. I'm an
9 Assistant Attorney General, and I have Joy Hernbrode and
10 Laurie Hachtel who are also present, but I get the first
11 opportunity to present some testimony.

12 CHAIRMAN NOBLE: I understand Mr. Fuller is
13 your witness.

14 MR. KATZ: Yes, sir.

15 CHAIRMAN NOBLE: Would you please introduce
16 him for the record?

17 MR. KATZ: Yes, he is Jon Fuller, and he is a
18 hydrologist and geomorphologist, certified engineer here
19 working out of Tempe, Arizona, and has been involved in
20 this adjudication since near its beginnings. And I'll
21 have him explain a little bit more before we proceed.

22 Just for the benefit the Commission, it's
23 Mr. Fuller, and we have a boating expert, Don Farmer.
24 That's all we're expecting to present, but I think that,
25 just so you know and don't grow too impatient with us,

1 Mr. Fuller is going to be doing a thorough presentation
2 today just as we have had Mr. Burtell, Mr. Gookin and
3 others do so.

4 After this first hearing, I would expect that
5 our future presentations on the other rivers will be
6 shorter, because we don't need to lay the foundation or
7 groundwork that we're going to be doing in the next day
8 or two. And I don't know how long the cross-examination
9 will be.

10 CHAIRMAN NOBLE: As soon as Mr. Sparks is able
11 to find a seat, we'll go ahead.

12 Thank you. Please proceed.

13 MR. KATZ: Thank you very much.

14

15 JONATHAN EDWARD FULLER

16 called as a witness on behalf of State Land Department,
17 was examined and testified as follows:

18

19 DIRECT EXAMINATION

20 BY MR. KATZ:

21 Q. Mr. Fuller, I'm going to start out by asking
22 you just a few questions by way of background and
23 information, and then I'm pretty well going to turn the
24 floor over to you for your PowerPoint presentations with
25 an occasional interruption by me, and obviously by any

1 of the Commission members as they might see fit or
2 appropriate.

3 Would you state your full and correct name for
4 the record at this point in time?

5 A. Full name is Jonathan Edward Fuller.

6 Q. And, Mr. Fuller, where are you currently
7 employed?

8 A. At J.E. Fuller Hydrology and Geomorphology.

9 Q. And is that your own hydrology or engineering
10 firm?

11 A. I founded the firm, but I'm no longer the
12 owner.

13 Q. Okay. And would you tell us a little bit
14 about your educational background and experience?

15 A. I have a bachelor's in science, a bachelor's
16 of science in geology. I received that from Calvin
17 College in Grand Rapids, Michigan, in 1983. I have a
18 master's in geosciences from University of Arizona. Got
19 my diploma in January of 1987.

20 Q. And I'm not going to go through your entire
21 resume, but I have reviewed with you, and we have
22 marked, I believe it's under Exhibit X012, Evidentiary
23 Part No. 76, as your resume or, as they say in the
24 Latin, curriculum vitae.

25 Have you had a chance to review that and are

1 you the one that prepared it?

2 A. Yes and yes.

3 Q. And does it accurately state your education,
4 background, and professional work experience?

5 A. Yes, it does.

6 Q. Also, as Part No. 77 to that same Exhibit
7 X012, you also prepared a list of some of your
8 significant publications; is that correct?

9 A. That's correct.

10 Q. And have some of these publications been peer
11 reviewed by other engineers or hydrologists?

12 A. Yes, some of them.

13 Q. And I'm not going to go through the long list
14 of those. If the Commission has any questions on those,
15 obviously they'll be free to ask.

16 Going back to about 1992 or 1993, did you or a
17 firm you were working with get retained or hired for
18 purposes of investigating the navigability of various
19 rivers in the State of Arizona at statehood in their
20 ordinary and natural condition?

21 A. Yes, the firm I was working for, CH2M HILL,
22 was retained by the Land Department. At that time the
23 ordinary and natural condition was something that we
24 considered, but it was less prominent than it is today.

25 Q. And did you in accord with that have the

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1 opportunity to review literature and engage in actual
2 scientific examination of the Gila, Verde, Salt, San
3 Pedro, and Santa Cruz Rivers?

4 A. Yes.

5 Q. And at the time you or the firm you were then
6 working with was hired, did the Land Department give you
7 any instructions or in any way suggest that these
8 various river systems were or were not navigable?

9 A. No, they did not.

10 Q. And did anybody tell you what you ought to be
11 finding here with respect to the navigability of any of
12 the rivers in question?

13 A. Nobody from the Land Department, no.

14 Q. And previously, we have had admitted or
15 presented to this Commission, at least some of our
16 current and prior members, various exhibits. And one of
17 those included evidentiary Exhibit 1, Part 5, which was
18 a navigability study draft report dated October 1994,
19 revised 1996, prepared by the Arizona State Land
20 Department. And were you involved in the preparation of
21 that initial report?

22 A. The initial report we coordinated with the
23 Land Department. We were actually working on other
24 reports. That report was done in-house originally by
25 the Land Department.

1 Q. Okay. But there was a second report as well
2 that was done that dealt with the upper Gila River,
3 correct?

4 A. Yes.

5 Q. And did the firm you were working with do that
6 report in its entirety?

7 A. No, we were part of the team. Stantec was the
8 lead consultant. We did the hydrology and hydrology-
9 geomorphology portion.

10 Q. And I believe that that is, if I'm not
11 mistaken, part 1 or Exhibit -- evidence 1, part 14 that
12 was previously presented to this Commission.

13 Then, let me ask you, Mr. Fuller, in or about
14 2003, were you asked to revise both of those earlier
15 reports, the one done by the Land Department on the
16 middle and lower Gila River, and the upper Gila River
17 that you had been engaged in previously?

18 A. Yes.

19 Q. And in 2003, do you believe that -- and that
20 was evidence Exhibit 2 and 4. Were those reports
21 accurate, scientifically and historically accurate to
22 the best of the knowledge that you had at the time that
23 you presented those reports?

24 A. Yes.

25 Q. And in 2003, you did ultimately determine,

1 without influence from the Land Department, that both
2 the lower, middle, and upper Gila River were navigable
3 at statehood in their ordinary and natural condition,
4 correct?

5 A. That's my opinion, yes.

6 Q. And it's your opinion today, that both the --
7 at least most of the upper Gila River and portions of
8 the middle Gila River are navigable even today?

9 A. That's correct.

10 Q. But some of the middle and lower are not. And
11 why is that?

12 A. Because the water has been removed from the
13 river.

14 Q. And that's by way of damming and diversion?

15 A. That's correct.

16 Q. Since 2003, did you over the last year or two
17 since remand --

18 MR. SPARKS: Pardon me, Your Honor. Pardon
19 me, Counsel. But people back here can't hear the
20 question or the answers. I don't know whether the
21 microphones work or they don't work, but we can't even
22 read lips because they're not pointing in our direction.

23 CHAIRMAN NOBLE: There is no sound
24 amplification that we're using today. We might be able
25 to fix the system so that we can have some sound

1 amplification. But these microphones are for recording
2 purposes only.

3 MR. KATZ: And I'll try to speak up. I
4 usually am not having difficulty being heard. They make
5 me close my door in the office.

6 VICE CHAIRMAN HENNESS: Mr. Chairman, it would
7 help if Mr. Fuller would try to project a little more,
8 too.

9 BY MR. KATZ:

10 Q. That's fine. Mr. Fuller, I believe that I was
11 asking you whether or not you had the occasion to --
12 since the remand of the Winkleman case by the Court of
13 Appeals that dealt with the lower Salt River, and we
14 agreed that whatever they decided would be applicable to
15 all of the remaining river systems that we were going to
16 litigate or adjudicate.

17 Have you done additional work in the last year
18 or two to revise those 2003 reports?

19 A. We did not. I have done additional work. We
20 have not revised those reports. Information I'm
21 presenting today would be in lieu of revising those
22 reports.

23 Q. And those are the two PowerPoint presentations
24 that I believe have now been marked as Exhibit X020, and
25 you prepared two different PowerPoint presentations that

1 we have already shared with the parties in this case as
2 well as the Commission?

3 A. That's correct.

4 Q. And what did you do in order, or what process
5 did you follow in order to prepare these two
6 presentations?

7 A. In light of recent court decisions, including
8 those in Arizona as well as the Montana PPL case, we
9 looked in more detail at the ordinary and natural
10 condition of the river, what it would have been without
11 man's influence.

12 We also were able to collect information that
13 was not available, we were unable to find previously.
14 As such information came available we included that in
15 these updated presentations.

16 Q. And before I get into those presentations, and
17 once we do that, I'll probably only interrupt you if I
18 get lost or confused or sense that members of our
19 audience or the Commission might need some further
20 clarification.

21 But you did review back in 2003 and again
22 recently the Santa Cruz and San Pedro Rivers, correct?

23 A. Correct.

24 Q. And it was your conclusion that neither the
25 Santa Cruz nor San Pedro River were likely navigable in

1 their ordinary and natural conditions at statehood,
2 correct?

3 A. That's correct.

4 Q. And you did that because that's what you felt
5 the facts supported?

6 A. That's correct.

7 Q. And when you are today concluding that the
8 Gila River, at least portions of it today, and the
9 lion's share of the river at statehood were navigable in
10 their ordinary and natural condition, that's based upon
11 science and historical investigation, correct?

12 A. That is correct.

13 Q. You've prepared two separate reports in this
14 matter. One of them is called Boating in Arizona. What
15 is that primarily designed to illustrate?

16 A. Well, it's boating in Arizona, as the title
17 suggests, so it would be the types of boats that were
18 available as of the time of statehood, how boats were
19 used, the nature of the challenges of using boats,
20 perspectives on how boats were used and the thinking in
21 using boats or not, and I'm probably leaving out a
22 couple things, but fortunately, we'll go through that in
23 some detail later.

24 Q. And by and large, this report was done for use
25 not only on this adjudication, but hopefully, with

1 perhaps some minor updates, you would be asking this
2 Commission to take a look at for purposes of future
3 adjudications on Salt and Verde Rivers, correct?

4 A. Correct. Our intent is not to repeat this
5 presentation.

6 Q. And you prepared a second presentation that
7 deals with the navigability issues regarding the Gila
8 River, correct?

9 A. That is correct.

10 Q. And you also, as part of that presentation,
11 lay some background with respect to certain concepts,
12 such as ordinary and natural?

13 A. Yes.

14 Q. And other definitions that may have been
15 discussed by other experts in the San Pedro and Santa
16 Cruz hearings that have already occurred before this
17 Commission in the last year?

18 A. Yes.

19 Q. Without further ado, I will only interrupt you
20 if I end up feeling it appropriate, and obviously, the
21 Commission is more than free to interrupt you at will.

22 If you would, feel free to begin your
23 PowerPoint presentation, and I hope everybody is able to
24 see it.

25 A. Mr. Chairman, members of the Commission, I'll

1 just echo what Mr. Katz said. If you have questions
2 along the way, get my attention. I'll be happy to
3 answer them. It would be nice to break things up a
4 little bit. As you get to a point where you need a
5 break, get our attention. We're happy to take breaks as
6 well.

7 So the first of our two presentations regards
8 boating in Arizona. And for those of you listening back
9 here, my audience is the Commission. But if you cannot
10 hear me, please say something, and I'll try to speak as
11 well as I can, but by necessity, pointing at my computer
12 and at my primary audience here.

13 Okay. We went through my resume here. I am a
14 registered engineer, a registered hydrologist, and a
15 registered geologist in the State of Arizona. Civil
16 engineer in a number of states. I'm also a boater,
17 spent a lot of time on rivers. I grew up on rivers,
18 paddling, and moved to Arizona in 1984 and kind of left
19 that behind.

20 And in 1992 started doing navigability studies
21 and discovered that there are a lot of very interesting
22 rivers in Arizona and started boating again, and have
23 boated throughout the West and throughout the United
24 States whenever I have the time and opportunity. So
25 speaking from a lot of personal experience, as well as

1 the academic study here for these projects.

2 Again, our touchstone for all that we're doing
3 today is the Daniel Ball Test, the federal standard for
4 title navigability.

5 You want to look at the river in its ordinary
6 and natural condition, Daniel Ball tells us whether the
7 river was used or susceptible for use as a highway for
8 commerce, that trade or travel should be occurring on
9 water. We're not looking at trade and travel down
10 riverbeds on foot or on hoof. And we're also looking at
11 the customary modes of transport on water.

12 Q. And, Mr. Fuller, if I might just quickly
13 interrupt. It says, "Over which trade and travel were
14 or could have been conducted," correct?

15 A. That's correct.

16 Q. So its susceptibility, not only actual use,
17 although you're going to be presenting examples of
18 actual commercial or other uses of the river, correct?

19 A. Yes, indeed.

20 Q. Please go ahead.

21 A. I'm actually going to speak more to ordinary
22 and natural in my other presentation, but in general
23 this means prior to human disturbance, the simplest
24 definition. On water, we're talking about boats and
25 watercraft, as I mentioned, not wagons, hoofs or feet.

1 Trade and travel is simply some sort of exchange of
2 commodities; and travel is, according to the Webster's
3 dictionary, it's to go on as if on a trip or a tour.
4 Susceptibility, as Paul just mentioned, basically is,
5 there is sufficient depth of flow to float a boat. Its
6 actual historical use is not required. And customary
7 modes would be what boats were available at the time of
8 statehood and were in use for trade and travel.

9 Diving right in, around the time of statehood
10 in Arizona, which was 1912, typical trade and travel
11 uses included a lot of things. We've heard a lot about
12 hauling of goods, thinking about big boats carrying
13 heavy loads. That indeed is a trade and travel use that
14 occurred and in a variety of types of boats. You can
15 see the chart on the right there with checkmarks with
16 the different types of boats in ranges of sizes. It
17 certainly is not an exhaustive lists of boats, but it
18 represents the range.

19 But that's not the only trade and travel use
20 that went on in around 1912. Hauling passengers or
21 carrying passengers, I guess would be a politer way of
22 saying it.

23 River guiding was a legitimate trade and
24 travel use on rivers.

25 Exploration, use of boats by the military,

1 ferries. We'll talk about each of these specifically in
2 a little more detail coming up.

3 Fishing from boats. Trapping and hunting was
4 a very common use for boats on rivers as of the time of
5 statehood.

6 Survey, mostly in the sense of boundary
7 surveys as well as surveying, exploring, that sort of
8 thing.

9 Travel, obviously in boats.

10 Carrying the mail.

11 These are all the kinds of things people were
12 using boats for around 1912, and those are the kinds of
13 uses we're looking for when we're looking at the actual
14 and susceptible use of rivers.

15 And again, in this presentation, I'm speaking
16 generally about boats. When I get to each of the rivers
17 as we get to this hearing and the upcoming hearings,
18 I'll talk specifically about those kinds of uses on
19 those specific rivers where and when and what
20 conditions.

21 There are a lot of boats that are available in
22 1912. Even limiting it to those boats that were
23 available in and around Arizona around 1912, there's
24 still a wide variety. Steamboats, flatboats, which what
25 I would throw into that category, other words that are

1 used to describe flatboats or just flat-bottom boats
2 that have a shallow draft that don't go very deep in the
3 water. Skiffs, scows, rafts are other words for that.

4 Canoes, of course, rowboats, and dories and
5 riverboats. And I'll distinguish those from flatboats,
6 although some rowboats have flat bottoms, but those that
7 are propelled with oars rather than paddles.

8 And, of course, ferries which are primarily
9 used for crossing rivers. But there are also many other
10 types available, including inflatable boats, motorboats,
11 kayaks, dugouts that were used in Arizona, other places
12 near Arizona and around the world.

13 And one thing in doing some research on boat
14 types, you find that there's just a tremendous variety
15 of boats. Boats were adapted for specific rivers, for
16 specific water bodies, whatever it might be. Folks got
17 there, discovered they could use a boat. Found either
18 the boat they brought with them or boat they made, used
19 it, improved on the design, and that's just a natural
20 evolution of the boat types.

21 You look at the wide varieties available; it
22 reflects the different uses and the types of water
23 bodies they're being used on.

24 As an example of that, I'm giving you this
25 quote here from this book, Riverboats in America from

1 1966.

2 Q. And we're at page 8 of your PowerPoint
3 presentation?

4 A. We are.

5 Q. Now getting to historical boats and examples?

6 A. We are.

7 Q. Go ahead, please.

8 A. This quote right here, "Before 1830,
9 commercial boating in the West was limited to canoes,
10 flatboats and keelboats." I would just like to
11 underscore that, because it's saying right here in this
12 academic source that commercial boating is not limited
13 to a specific type of boat. And in fact, they're saying
14 in the West in the early years, canoes, flatboats and
15 keelboats were the deal. The bigger boats hadn't got
16 there yet.

17 Going on, as an example on the Missouri River,
18 which I understand is not in Arizona, but I'm using this
19 as an example of a principle. They left St. Louis. It
20 took them three years to build up the techniques and the
21 skills and the modifications to their boats in order to
22 make it upstream. Now, the Missouri River, the lower
23 Missouri River it is agreed that it is a navigable
24 river. But it also calls out that sandbars were one of
25 the obstacles that they had to deal with, and it took

1 them time to figure out how to move past them. And in
2 fact, if you've read a little Mark Twain, you understand
3 that knowing where the sandbars were and avoiding them
4 was one of the big challenges on the Mississippi River,
5 as it is today. If you read accounts of people boating
6 the Mississippi River, you'll find that barges still
7 occasionally get stuck on sandbars. And we agree that
8 the Mississippi River is a navigable river.

9 Q. Let me just interrupt you. You said three
10 years. Didn't you mean it took 27 years to acquire the
11 necessary skills and types of boats needed to navigate
12 the Missouri?

13 A. You are correct. I misspoke. 27 years to
14 acquire those skills. Those skills involved to change
15 the boats and get the experience and develop the
16 maneuvers to get up the river, get down the river. So
17 it's an evolutionary process that takes some time. You
18 need to have the river in a condition in which its
19 boatable for a long time to overcome them on a new
20 river.

21 Another example -- again not from Arizona, but
22 it's the principle we're looking at here -- relates to
23 sweep scows. Sweep scows were a specific type of boat
24 that basically were a big wooden bathtub with two long
25 oars that went in the front and the back and the bow and

1 the stern. They were developed for use on the Salmon
2 River, a rocky, steep river where current moves fast.

3 Specific adaptations there were, they realized
4 that going downstream was the thing. They would put on
5 their passengers, whatever their load would be. They
6 would trade their way down the river. They would get to
7 the bottom. They would sell their boat for scrap, take
8 whatever means they needed to get back up the river, and
9 start again. And they did that for years and years and
10 years. So it's an adaptive use, downstream only, the
11 specific type of boat. And the Salmon River, again, is
12 a navigable stream.

13 In the Utah case, which is often cited in the
14 discussions of our rivers, the water master there noted
15 that there were a variety boats. Not just the biggest
16 boats. Rowboats, different sizes, different lengths,
17 different drafts as well as canoes being used for
18 exploration, cargo, trapping, hunting, et cetera. Lots
19 of different kinds of boats used on different kinds of
20 rivers.

21 Boats were made of different kinds of
22 materials back in 1912. Wood, we would expect. Metal,
23 you might be a little bit surprised. 1894 was the first
24 aluminum boat that was introduced. Canvas boats, easily
25 in the 1800s. Probably used much earlier than that.

1 Inflatable boats or rubber boats, you might be surprised
2 to learn, that were around a long time. Inflatable
3 boats date back to well before the time of Christ. They
4 were used -- rubber rafts were invented in the 1800s.
5 And I'll show you a little bit of information on those.
6 Composite boats, boats made of different kinds of
7 materials, as well as the indigenous people were very
8 clever and developed boats made from reeds, wicker, and
9 made their own inflatable boats using hides. Some cases
10 using pottery, centuries before Euro-Americans came to
11 the West.

12 Q. And you skipped skins, but that's hides,
13 essentially?

14 A. Yes.

15 Q. And those characteristics of a canoe made out
16 of hide would be very similar to a canoe made out of
17 canvas?

18 A. Yes. Another example of historical boats by
19 way of illustration, this one is from Arizona.
20 Lieutenant Ives, Joseph Ives, the Ives Expedition is
21 famous for a number of things, going up the Colorado.
22 He was an experienced boatman. In that case they were
23 using steamboats on the Flax River, which we believe is
24 the Little Colorado River, he notes, underscored there,
25 it says, "For want of tools and materials to construct a

1 raft, this would have been difficult, if not impractical
2 undertaking, had we not been provided with one of
3 Buchanan's portable boats." So standard military issue
4 was one of these portable boats. He goes on to describe
5 in the lower footnote there, these are canvas over a
6 pine frame. They weighed about 150 pounds. Packed on a
7 single mule. They were easy to assemble. He describes
8 them as being lightweight, durable, and staunch. In
9 other words, resistant, durable. They had also been
10 used in Indian wars in other states in other places.

11 In Arizona, most of the boat use historically
12 was limited to these kinds of boats: steamboats,
13 flatboats, ferries, rowboats, canoes, and instances of
14 floating logs.

15 Q. This is slide 14, and you have in parentheses
16 the various rivers in Arizona that you believe there are
17 historical accounts for the use of these various types
18 of boats, correct?

19 A. Yes. Thank you for that clarification. And
20 again, I'll be talking about the rivers specifically in
21 later presentations. But in general, this is what we
22 found.

23 Also, in general, what we find is that the
24 seasons that were boated were year-round. It was
25 throughout the year. It's not limited to a specific

1 time of year, so we find these historical accounts from
2 throughout the calendar year, and they're boating during
3 normal low water; they're boating during normal high
4 water. Floods are not part of the ordinary and natural
5 condition of the river. There are some accounts of
6 people trying to use boats in floods, but in my mind, I
7 set those aside. They're not part of the ordinary and
8 natural condition, and I don't want to consider them
9 further.

10 But we know that that doesn't mean it's a
11 constant flow rate either, and we'll get to that in our
12 Gila River presentation.

13 The other question is you're looking at all
14 these accounts and reading these histories. Eventually
15 the thought comes to you that if the rivers weren't
16 boatable, why did people have boats. We keep coming
17 across a situation where someone comes to a river and
18 they need to cross it and they say, well, we went and
19 got so-and-so's boat, or there needed to be a rescue and
20 they got this boat. Or they did this. There's always
21 boats around. And if the rivers are dry and shallow, it
22 makes you wonder if pioneer folks who have a very
23 limited amount of resources spent their money carrying
24 around boats.

25 Let's take a look at the specific types of

1 boats. Steamboats largely were used on the Colorado
2 beginning in the 1860s. The steamboats themselves,
3 early use on the major rivers and they're adapted for
4 the specific river conditions. Steamboat use ended in
5 part because of the construction of the Imperial Dam.
6 That was kind of a death knell, death knell.

7 But also from competition from the railroad.
8 The railroad actually came in and bought out some of the
9 steamboat franchises, railroads being known for that
10 kind of competition, competitive behaviors, and kind of
11 shut those things down. Persisted a little bit but
12 eventually went away, outcompeted by the railroads.

13 We also have some historical records on the
14 Gila River from what I'll call Segment 8, and I'll
15 describe what that is in a later presentation, but the
16 lower part from Colorado confluence up to about Dome,
17 the community of Dome, about 20 miles upstream. And
18 that was occasional use in the upstream and downstream
19 direction.

20 Those boats, as you can see from the picture
21 previously, were not small boats. They were 60 to 150
22 feet long. Originally they came in and they drew about
23 30 inches of water. They were modified and adapted and
24 reconstructed to the point where they could add about 50
25 tons and draw about 19 inches of water.

1 Kinds of the uses, trade and travel uses,
2 shipping, passengers, exploration, the Ives Exploration,
3 for example, the military -- Lieutenant Ives was
4 military -- travel, carrying the mail, and they were
5 definitely available prior to Arizona statehood. And
6 again, on the Colorado and the Gila. Big boats. For
7 scale, you see an individual standing right there. So
8 you can see that these are large craft.

9 Again, the actual use of the boats dried up
10 around 1877 and years after. Through boating the
11 Colorado River was prevented by the construction of the
12 Imperial Dam.

13 Another thing interesting in reading the
14 history of these boats is that they developed specific
15 techniques in Arizona. One was called the Crawfish
16 maneuver where they went stern first and used the paddle
17 wheel to claw through some of the sandbars that were
18 shallow in the water.

19 Another interesting thing as you read the
20 history is the use, listen to some of the kind of
21 descriptors that were used.

22 In this case, taking documents from the
23 Arizona Territorial Legislature and the book Steamboats
24 on the Colorado, which we may hear other testimony on
25 this week. It describes the Colorado as being navigable

1 in high stage. Now, remember, the Colorado River is a
2 navigable river.

3 Also describes having to deal with boulders,
4 snags, sandbars. It describes navigation as being
5 difficult and dangerous. It describes the river, places
6 that the boats were going as remote. Also talks about
7 powerful floods. But the one thing, despite all of
8 those kinds of impediments to using steamboats, they
9 were used, in fact used, but they weren't compatible
10 with man's use of the river when we started building
11 dams.

12 And the last look at steamboats and the ferry
13 down from Yuma, a sketch from 1875.

14 Let's move to ferries. There's a picture of
15 Hayden's Ferry crossing the Salt River. I'm using this
16 as an example of a type of ferry and the size of it.
17 You can see it's carrying a number of people, a wagon
18 and team. Also interesting in the background you see a
19 bridge crosses the river. There was another way across
20 the river. There was a railroad bridge, obviously. But
21 still using the ferry.

22 This is a rendering of the Whipple crossing of
23 the Colorado River in an inflatable boat in the 1850s, I
24 believe this was. Made some inflatable things, loaded
25 on equipment, took it across the river.

1 Another example of a type of ferry. A wooden
2 ferry here. And basically the way these ferries worked,
3 there was a cable that crossed the river. You hooked
4 your ferry boat to the cable. Pulled your way or had a
5 mechanical way to pull your way across the river,
6 unloaded your boat and on folks went.

7 Q. Let me just ask you this. If you could easily
8 walk across these rivers or ride horseback or take a
9 wagon across, would there be the need for these
10 ferries?

11 A. I would think not. Sometimes the ferry,
12 charges for the ferries were \$20. Sometimes more than
13 that. My opinion, that if I could take my wagon and
14 horse across the river, if it was normally shallow, if
15 it was normally less than a foot deep, as has been
16 suggested by some, there seemed to be no point in
17 getting on a boat, particularly if you had to load and
18 unload your material.

19 Q. Okay. And one other question. When you were
20 talking about cable ferries, that was slide Number --
21 was it 23 or 24?

22 A. We're in the 30s here, Paul.

23 Q. Okay. It says 24 up there.

24 A. Yes, 24.

25 Q. And also if you owned a railroad, would you be

1 building an expensive bridge across a river if the
2 riverbed was dry almost all the time?

3 A. For a railroad?

4 Q. Right.

5 A. Yes. I would build a bridge.

6 Q. If the river were normally dry?

7 A. If it were always dry and it never had any
8 flow, it wouldn't be a river. If it were sometimes
9 subject to flooding, you probably would want your
10 railroad elevated above it.

11 Q. And again, you're not offering opinions as a
12 railroad expert, correct?

13 A. No.

14 Q. Go ahead.

15 A. As a hydrologist who has worked on a number of
16 river crossings for railroads.

17 So ferries, we backed up one. I'm going
18 forward again. I'm now on slide 25. Now, this is a
19 picture of the Dome Ferry, and it clearly, since it has
20 an automobile in there, we see that it operated up very
21 close to the time of statehood. Probably past
22 statehood. This is a relatively small ferry. Fits a
23 car and not much else.

24 Q. But this is the Gila River, correct?

25 A. This is the Gila River. This is also the Gila

1 River. This is Governor Hunt at statehood on his way to
2 Florence, I believe it's Sacaton, taking the ferry
3 across the river in 1916 in March.

4 Q. This is slide 26?

5 A. This is slide 26. And I recognize that some
6 courts have questioned the importance of ferries for
7 navigability, for title navigability, and what I'm
8 suggesting here is the fact that you had to use a ferry
9 was evidence of the susceptibility of the river. If the
10 river were shallow, you'd walk across, you'd take your
11 horse across, you'd take your horse and buggy across.
12 If it were deep enough to float a boat carrying a car,
13 you would use a ferry. It would need to be there,
14 relatively -- you would need that ferry a fair amount of
15 the time. If it was the kind of thing where a flood
16 came up and it was come and gone in a couple days, it
17 was very unlikely anyone would have the resources and
18 time or waste the time to build a ferry, set a cable,
19 get it across the river. So it just wouldn't be an
20 economic sort of thing. You would just wait it out.
21 Ferries eventually replaced bridges at public expense
22 and were eliminated with time.

23 Typically ferries are going to draw in the
24 neighborhood of a foot or so. So basically you would
25 want two feet or more. Again, for the same reason if it

1 were shallow, you wouldn't bother. Use for obviously
2 commercial, carrying passengers, military, mail across
3 the river.

4 Ferries are used on lots of Arizona rivers.
5 This is a graphic here that shows where they were used,
6 where they were known, established ferries that were
7 documented in the historical record.

8 Q. And that's slide 28?

9 A. We are now at slide 28.

10 Q. All right.

11 A. And our primary interest here is that they
12 demonstrate the susceptibility to boating, at least at
13 that location. One last shot of the photo of the Gila
14 River Ferry in 1913.

15 Let's move to flatboats, skiffs and rafts.
16 Again, these are just flat-bottom boats, low water drop.
17 I think there's an error in your slides right here. I
18 caught this this morning as I was looking through my
19 slides. That should say one foot as I have here as
20 opposed to two foot, and you'll see that documented and
21 repeated in other slides at one foot. This is a place
22 it was marked incorrectly.

23 Q. And it's slide 30. Go ahead.

24 A. I'm making that correction notice here.

25 There's shallow draft boats used typically for

1 hauling goods. Some for travel. Some carrying
2 passengers. Some for exploration, and again, used as
3 ferries. And they were used in a number of places in
4 Arizona. We'll talk a great deal about the uses on the
5 Gila later today or tomorrow.

6 Flatboats, number of different names, types
7 that apply to them. Strip skiffs, board skiffs, canvas
8 skiffs, went over a wood frame. Different ways of
9 creating a flatboat, and they're basically propelled
10 either by poles or you pole your way along. It's a long
11 stick basically that points in the water and you push
12 your way down and steer with it. Sometimes they're
13 mounted with oars. Other times they just float in the
14 current and bounce off things. And if you don't have
15 oars and you don't have experience, the boats can be
16 kind of unwieldy, and it can be kind of difficult to
17 control. And if you're boating in that sort of
18 circumstance, you're going to have more difficulties and
19 you're going to have some episodes where you might tip a
20 boat, ground a boat, and need to work a little harder to
21 get upstream or downstream.

22 Some pictures of flatboats that were in use at
23 that time. Again, they're pretty simple construction,
24 flat bottomed, made of wood. Various different
25 propulsion systems: paddles, oars, poles. Some cases

1 could be quite crude. Particularly as it relates to
2 rafts, not much more than logs tied together. Sometimes
3 with oars. The photo on the right here is recreating
4 the James White story who was supposedly the first
5 person to raft, go through the Grand Canyon on a boat.
6 These fellows are trying to recreate that to determine
7 whether his story was true or not. But the point here
8 is sometimes rafts could be quite crude but used to get
9 down river.

10 Couple other photos. These from Arizona.
11 Some flatboats and rafts in use, various times.

12 Another type of boat that was used extensively
13 in Arizona are rowboats and dories. A dorie is a
14 specific variety of rowboat, something that's propelled
15 by two oars.

16 And the upper right you see the Major Powell,
17 John Wesley Powell's famous boat with his chair strapped
18 to the deck. Not exactly the most efficient way to get
19 down a river, but that's the way he chose to do it. And
20 then went down the Green and Colorado Rivers famously in
21 the 1860s.

22 And then more recently folks have rebuilt his
23 white hull boats, which were notoriously bad boats for
24 the rivers that he chose to use them on, but they
25 rebuilt replicas, and just recently BBC took a tour down

1 there and recreated his expedition. We'll talk about
2 that a little bit more.

3 So rowboats and dories. Again,
4 specifications, these can be short boats, 6 feet long to
5 over 20 feet long, and depending on their size and
6 design, you know, they draft from three inches. That
7 would typically be a canvas boat, a lightweight canvas
8 boat. And they were designed specifically to go in
9 shallow water.

10 Now, before we get too hung up on the
11 3 inches, let me just explain here. If a river is
12 always 3 inches deep, that's its maximum depth, there's
13 not many people going to be boating it. But when I say
14 3 inches here, I mean, if there's an obstacle, a sandbar
15 that's 3 inches, these boats are built to go over that.

16 Typically you're looking at a foot or more
17 when people are using rowboats and dories.

18 Q. Some folks have suggested that you need two
19 and a half or three feet. Is that a correct assessment
20 of low flow or medium flow requirements for boats of
21 this type?

22 A. It depends on the boat. Some large rowboats,
23 steel, V-bottom hulls would function better at greater
24 depths.

25 Q. But those aren't the type of boats you would

1 typically be using on the Gila or other Arizona rivers,
2 correct?

3 A. There are places on the Gila where you could
4 use that kind of boat ordinarily, and there are places
5 where that would be less ordinarily.

6 So they were used in Arizona, and there are
7 actual accounts from various rivers in Arizona. Those
8 sorts of boats were available lots of different ways.
9 You build them yourself. You could pull out your Sears
10 catalog and order one, and they would bring it to you on
11 the train or the stage. Montgomery Ward's, same thing.
12 We have a 1912 Sears catalog replicated here, and also
13 look up the Montgomery Ward in 1895, wood and canvas
14 boats come in the mail.

15 Pictures here are the Edith, which is part of
16 the Grand Canyon National Park collection. It's one of
17 the Kolb brothers' boats that they took down in the
18 Grand Canyon in 1911. And it's the famous expedition
19 that they filmed. And those films are still shown
20 commercially today.

21 These are the specs from that boat with depth,
22 dimensions. Fairly large boat. Meant to carry one or
23 more boatmen and passengers, sealed compartments. Keep
24 the loads dry.

25 Q. And you indicate that that boat had a load

1 capacity of about 2,000 pounds, correct?

2 A. That's what they designed it for.

3 Q. And it wouldn't matter whether that was 2,000
4 pounds of people or 2,000 pounds of supplies or goods?

5 A. Supplies and goods are easier to stow in the
6 compartments than people, but other than that, no.

7 Q. And that was slide 38. Please go ahead.

8 A. Thank you for reminding me, because I got a
9 little behind in my paper.

10 The boat that you're looking at right here is
11 from the Green River in Utah, and it's just a nice
12 picture of the kind of simple constructed boats that
13 were used by trappers and fishermen on rivers in the
14 West around the time of statehood.

15 Some other pictures here of people sitting in
16 boats on Arizona rivers. Again, we'll talk about these
17 specifically, just showing that here's photographic
18 evidence of folks seemingly happy, seemingly very
19 comfortable. Not looking particularly daring or
20 adventuresome, sitting in boats around the time of
21 statehood, various types.

22 Q. And that was slides 40 through 42. Go ahead.

23 A. Correct. And we are on slide 43 now.

24 Let's talk a little bit about canoes. I think
25 we all have an image in our mind. In my mind, a canoe

1 is a boat with a pointy end, and it is propelled with --
2 two pointy ends usually, and is propelled with a paddle
3 as opposed to oars. But there are canoes that people
4 have put oars on and used different kinds of paddles on.

5 Here we see four people sitting in a boat at
6 the confluence of the Salt and the Verde River. Gives
7 you size of the scale of the river.

8 This is the Kolb brothers. Another gentleman,
9 I think his name is Dave Rust in a canvas and steel
10 boat, steel frame, canvas over the top, and four people
11 sitting in it propelled by oars. Not drawing a lot of
12 water, and one of the advantages of this type of boat is
13 that it flexed, which is not great for efficiency of
14 paddling, but very good for going over obstacles. So
15 they were built specifically to get into rivers that
16 people had not been into before.

17 Q. Were canoe designs such as this, irrespective
18 of the materials they were made of, available prior to
19 1912 --

20 A. Oh, yes. This photograph here is from 1911.

21 Q. And did Native Americans, according to your
22 historical research, build boats out of wood frames with
23 skins similar to canvas?

24 A. Yes, the skin-frame boats are probably not
25 canoes. They were probably more coracle shaped,

1 rounded. But they did build dugout canoes, various
2 Native Americans. Of course, other places in the United
3 States, Native Americans were famous for having built
4 canoes, dugouts and whatnot.

5 Q. And you'll get into a greater discussion of
6 canoes and their use later, correct?

7 A. Yes. We'll go through a little bit right now.

8 The sizes of canoes varied from 8 feet, which
9 I consider a small canoe, to large boats, 25 feet. I'm
10 using for the purposes of my testimony 6 inches as a
11 minimum flow. I personally have boated in depths that
12 are less than that. But again, in my mind, 6 inches is
13 a nice minimum one, because our streams generally had
14 depths -- well, the Gila River had depths greater than 6
15 inches always except during the most extreme drought
16 over the length of the river, and at less than 6 inches,
17 it becomes a little less fun to paddle.

18 Q. And since you mentioned extreme drought,
19 extreme flood or drought wouldn't be considered an
20 ordinary condition under the Daniel Ball Test, correct?

21 A. That's correct.

22 Canoes are used for lots of different kinds of
23 things. Hauling goods, clearly smaller loads than would
24 be in a barge. But still hauling goods, passengers,
25 river guiding, exploration, military used them.

1 Fishing, trapping, travel, carrying the mail, and we
2 have lots of documentation of people using canoe-type
3 boats in Arizona.

4 They can be either dugouts created from `a
5 single log. It can be strip canoes that fitted wood
6 pieces. Canvas was a very common construction type
7 available around the time of statehood. Used not only
8 in the downstream direction, but as you see in the
9 picture here from 1908, a fellow poling upriver on a
10 canoe. But many, many, many varieties of canoes
11 available at the time depending on the type of water
12 that was available and its intended use for the boat.

13 Another thing to point out is in comparing
14 modern and historic boats, should note that the wooden
15 canoes weigh about the same as today's plastic canoes.
16 Canvas canoes today weigh about the same as today's
17 Kevlar canoes, and the durability of each are about the
18 same.

19 Q. And let me ask you this. Whether we're
20 dealing with prehistoric canoes, canoes at the time of
21 statehood or modern canoes that are often made of
22 fiberglass or Kevlar or plastic, is there any difference
23 in their general dynamics or the draft that is required
24 or the depth of water required for their operation?

25 A. No. The principles of physics are the same

1 now as before. And the design and the shape of the boat
2 and the water it displaces is responsible for how much
3 water it draws.

4 And the basic shape of a canoe -- I have some
5 slides later that I'll show you -- hasn't changed much
6 at all.

7 Some other pictures of canoe uses, folks in
8 rapids, folks in suits in rapids, dugout canoes.
9 They're using a variety of places and spaces.

10 Q. And we've gone through slide 48. You just
11 turned to 49.

12 A. That is correct.

13 Q. And so just going forward.

14 A. Canvas boats I've talked on and off about.
15 Different kinds of boats are made of canvas. These
16 folding boats were typically used, as I mentioned, in
17 Lieutenant Ives' account for folding up, storing,
18 hauling out when you needed them, using them, putting
19 them back away. Military used a lot of them. They were
20 used in the Mexican-American War. They were used for
21 exploration of small streams. They certainly were
22 available in Arizona, and we have some accounts of
23 people doing that.

24 You can see examples of them if you go to the
25 National Park. Again, there's the Kolb brothers sitting

1 in theirs. That boat is available for viewing. I don't
2 remember if this one was in the Kolb Studio or in the
3 main building. And then you can see the advertisements
4 for these things in Hunter-Trader-Trapper magazine from
5 1908. You can see the side wall there. You probably
6 cannot read. It says the Kalamazoo Boat Company is
7 where the Kolbs got theirs, and it was shipped out
8 here.

9 Some other close-up views. This, for your
10 information, is their 1910 version of a life vest.
11 Consisted of cork strapped together. In this case it
12 had a wood bottom. Give it a little bit of rigidity and
13 a place to put your feet.

14 Boats themselves were described as having the
15 capability of reaching thousands of streams that could
16 not be reached until the folding canvas boat. So they
17 were built specifically for low water conditions, for
18 traders and for trappers.

19 Small boats, 9-foot boat, says carrying 350
20 pounds for 25 bucks, it could be yours. A larger boat
21 at 20 feet would carry 3,000 pounds and cost about 65
22 bucks. And they're described as being more reliable
23 than the inflatable boats, primarily because of the less
24 risk of puncture and they're easier, they're easier to
25 fix.

1 Q. And we've just gone through slides 51 and 52,
2 but let me just ask you this. Is there any significant
3 difference in the displacement of water by a 9-foot
4 boat, whether it had 150 or 350 pounds in it?

5 A. There is a slight difference in the
6 displacement of water.

7 Q. Matter of inches or feet?

8 A. Inches.

9 Q. And what about a 20-foot canvas canoe carrying
10 3,000 pounds or 1,500 pounds?

11 A. What were the two numbers? Sorry.

12 Q. Well, I just -- it said it carried 3,000
13 pounds.

14 A. Right.

15 Q. If it were fully loaded, would there be a
16 substantial difference in displacement between that and
17 having a couple of 200-pound guys on it?

18 A. I'm not trying to be difficult, but I'm not
19 sure of the meaning of substantial. But there would be
20 a difference. Probably in the neighborhood of four or
21 five inches.

22 Q. But not a foot or two?

23 A. No.

24 Q. Please go ahead.

25 A. And in fact, these boats were guaranteed and

1 they would outlast wood and steel, and that's a
2 sentiment that we see echoed in some of the descriptions
3 for military logs, people using these boats. Shipped to
4 anywhere, low draft. They're described as being able to
5 clear one-inch depths. That means like going over a log
6 or a rock. Talked about Ives's use and there was also
7 this kind of boat stored at Camp Verde.

8 And inflatables --

9 Q. Also, if I might interrupt, Joy Hernbrode just
10 advised me that we do have a few extra copies of the
11 presentation if any of the lawyers don't have one and
12 need one. I don't know how many extras.

13 Sorry for the interruption. Please go ahead.

14 A. Inflatable boats were also available and used
15 as of the time of statehood for the uses that are shown
16 there, river guiding, military, fishing. Actual use on
17 the Colorado, actual documented use on the Colorado.
18 Again Whipple, they used it to cross the river. So they
19 were available.

20 Interestingly, inflatable boats were -- the
21 first rubber boat was invented in 1837. Other kinds of
22 inflatables were used prior to then.

23 1853 was Whipple's crossing. Crossed the
24 ocean in 1866. Durability was improved in 1900.
25 Thirty-seven people started taking this particular kind

1 of boat commercially down the Grand Canyon. So those
2 boats were available.

3 As you see from looking at the pictures,
4 there's one from 1855 on the left and 1845 on the right,
5 and you can see they don't look much different than
6 inflatable boats that are still used today.

7 Comes to Native Americans, kinds of boat use
8 they were using prior to the time of statehood. They
9 were using primarily for fishing and ferrying, either
10 made their rafts from Tule bundles or unshaped logs,
11 which apparently is characteristic of the Maricopas.
12 They were either hand-paddled or poled. The Mohave and
13 the Halchidhoma used clay pots to get across the river.

14 Interior tribes have relatively limited record
15 of boating. We know the Apaches were thought to cross
16 the river in wicker baskets.

17 Archaeologist Frank Cushing reported that he
18 found a canoe in one of the Hohokam canals. We'll talk
19 more about that at a later date. And also note that the
20 Tohonos in their mythology, one of their stories regards
21 to using a canoe in a flood. So certainly they were
22 aware of the technology of canoes.

23 A lot of times they were making these canoes
24 or boats out of disposable materials. So bark or skin
25 over a wood frame. They were either used short-term and

1 abandoned. You went past the point you were able to go,
2 you just got out of your boat and let it go. Didn't
3 keep it. And they're generally very poorly preserved.
4 So they're not something that sticks around in the same
5 way that other archaeological artifacts might be.

6 Q. And we've been looking at slides in the mid
7 50s through slide number 59. Go ahead.

8 A. Moving on. It gives pause, wonder, well, what
9 might be some of the records for this limited record of
10 boating from the Native Americans in the interior tribes
11 in Arizona.

12 One may be that the boat materials are poorly
13 preserved. If you're building a boat out of reeds,
14 likely, it being around seven, six, seven hundred years
15 later is relatively low. It may be that they found
16 alternative modes more suitable. It also may be that
17 they had cultural beliefs about using the rivers.

18 In the Utah case the Special Master notes that
19 there were tribes that were unwilling or did not want to
20 use the rivers because of their cultural beliefs about
21 the rivers themselves.

22 You also start to ask yourself a question,
23 well, if these rivers are navigable, why aren't there so
24 many more accounts. And there's this basic paradox,
25 particularly as we're looking at the rivers in their

1 ordinary and natural condition.

2 In Arizona had the water -- when our rivers
3 had the water, we didn't have the population. If you
4 look at the population by census according to the U.S.
5 Census Bureau in 1870, the population of Arizona was
6 less than 10,000 people. Far less than half of those
7 people lived along a river. In 1870 the rivers were
8 already begun to be diverted and the waters being taken
9 out of the rivers.

10 Even by the time we got up to statehood, there
11 was still only 204,000 people in the entire state. It's
12 not a densely populated area so there just weren't a lot
13 of people to go do the boating. So when we had the
14 river, we didn't have the population. So when we
15 finally got the population, we no longer had the water.

16 So we built for ourselves a system in which it
17 discouraged the use of rivers, and therefore, we don't
18 see a lot of reported instances of using the rivers.

19 Q. And let me just ask you whether, were the
20 Native Americans from about 500 BC till the 1400s living
21 in stable agricultural communities along rivers, or
22 settlers that started moving in in the 1850s, '60s and
23 '70s, they were largely building agricultural
24 communities and diverting water for that purpose rather
25 than settling in large cities with manufacturing?

1 A. That's correct. The business of the river was
2 to take it out and farm it and drink it.

3 Q. Go ahead.

4 A. So we had this paradox. There weren't a lot
5 of people here. So there weren't a lot of people to do
6 the boating and there weren't a lot of people to write
7 about doing the boating.

8 The other reasons that there might not have
9 been more historical accounts is boating may not have
10 been that noteworthy. So there's probably not an
11 article in today's paper about somebody driving down the
12 U.S. 60. It doesn't mean nobody can drive down the U.S.
13 60. It just means it wasn't noteworthy. Could be that
14 they're only writing about the extraordinary trips.
15 Maybe they're used to seeing people boat around their
16 community of Yuma, let's say, on the river. But what
17 was unusual was a trapper who arrived in town or a miner
18 who arrived in town with materials. That was news.

19 Now, remember, in 1871, the railroad was
20 already here, and there were less than 10,000 English
21 readers in the entire state. There just wasn't that
22 much of an audience.

23 Also there may be a lot more published
24 accounts out there. We found a lot more from the first
25 time we did these studies 22 years ago to this time

1 around just because resources are more available now.
2 More things are online. It's easier to find them. You
3 can search by keyword and not have to read whole
4 newspapers to look for a keyword.

5 Also, river boating requires special
6 equipment. So you may not have had a boat. You may
7 have looked at the river and said, I could boat that,
8 but I don't have a boat. Or maybe you don't have the
9 skills to boat a river. You're not a boatman. It does
10 take special skills to get down a river right-side up.

11 Q. Let me also -- I asked you when you talk about
12 materials, there are rivers that have an abundance of
13 trees along their banks that could easily be used for
14 the construction of dugout canoes, correct?

15 A. Yes, there are rivers like that.

16 Q. Arizona rivers don't have a lot of wood that
17 is good for building dugouts or wood canoes along their
18 banks and beds, even in their ordinary and natural
19 condition, correct?

20 A. That's correct.

21 Q. Please go ahead.

22 A. Not compared to many other rivers other
23 places.

24 Also a lot of the population centers were not
25 located on the rivers. So if you were going from

1 Prescott to Tucson, you weren't going to take a river
2 because there wasn't a river that went there. If you
3 were going from Clifton to Lordsburg, there was no river
4 that was going to take you there. If you lived in
5 Wickenburg, you lived in Tombstone, you lived in
6 Flagstaff, there was no river for you. So a lot of the
7 people that were here didn't have the opportunity in the
8 course of their day-to-day duties to be on a river.

9 Similarly with the forts. They weren't all
10 located on rivers. A lot of them were upland and had
11 other reasons for being stationed where they were.
12 There just wasn't a river going there, and if you're
13 doing a resupply of those forts, your road may not go
14 along a river. Your route may not go along a river so
15 you needed some other form of transportation.

16 Also, important to remember when it comes to
17 the Gila specifically, it wasn't part of Arizona until
18 1853. You went along the south side of the Gila, you
19 were in Mexico, and it was not a friendly Mexico, and
20 there was also the Apache threat. The Apache wars were
21 not settled till 1886. So a good part of the time when
22 our rivers were close to their ordinary and natural
23 condition, they were either out of the country or they
24 had other threats that had nothing to do with the river
25 itself.

1 And then some of our rivers are not oriented
2 in the direction you wanted to go. For instance, the
3 Verde. If you were going east-west, you were an 1849er,
4 using the Verde wasn't an option to you, because it was
5 not going the direction you were going.

6 And as I've mentioned previously, there were
7 other modes available early on. Railroads came to
8 Arizona first in 1871 in Yuma and were across the state
9 before the end of the decade. Wagons and horseback,
10 people got here to Arizona using those means. When they
11 got here, even if there was a river, they still had
12 their wagon and their horse and things that weren't
13 necessarily compatible with jumping on the river.

14 And again, automobiles, early 1900s. And to
15 get in and out of Arizona, you needed something else.
16 So you didn't need a boat to get here. Even if you
17 could use a boat while you're here, you needed a boat to
18 get out of it when you left.

19 This graphic right here shows the location of
20 railroads present in 1912. So there were lots of ways
21 to get around the State of Arizona via railroad.

22 Q. And that's slide 66, and for the record, we're
23 just going through slide 63 through about 73 that
24 illustrate the testimony recently given that deals with
25 reasons why rivers may not have been navigated. Go

1 ahead, Mr. Fuller.

2 A. That's right.

3 And also you see on this slide the population
4 of various cities in the census that was closest to
5 statehood, and you can see that of the population
6 centers, few of them were located along rivers, and
7 those were not particularly robust populations.

8 By comparison in 1870, population of Phoenix
9 was about 1,800. Population of Tempe in 1870 was about
10 130.

11 Other reasons why there weren't more accounts
12 of boating, well, obviously, some segments are not
13 conducive to carrying major tonnage. So we're not going
14 to find any accounts of large barges like we see on the
15 Mississippi River running on any Arizona stream.

16 It's also not easy to travel upstream. These
17 rivers are relatively steep. They have some current.
18 It's possible, but it's hard work.

19 There are other ways to get around that are
20 easier, but the bottom line is, by the time we got
21 around to statehood, our rivers were dammed and
22 diverted. It didn't look like the ordinary and natural
23 condition.

24 What I'm getting at here is this logic that if
25 the river was navigable, people would have boated it,

1 and that's faulty logic, because there's many factors
2 involved in choosing to use a river for trade and
3 travel.

4 Float depth is obviously one of them. If it's
5 deep enough, that's one part of the equation. It's only
6 one part. Do I need to be on the river? What's the
7 cost of being on the river compared to other modes of
8 transportation that are available to me? What's the
9 speed of being on the river? I do a lot of boating.
10 You're going to boat at somewhere between a mile per
11 hour and four miles per hour. You need some skills to
12 be on the boat. And you need to be at a place where
13 there's river where you need to get on and it needs to
14 go to the place that you want to go to.

15 Another characteristic in Arizona is that our
16 terrain is relatively open compared to other parts of
17 the United States. Here in the southeast, for instance,
18 the river core is, the vegetation in the hills is so
19 dense it's very difficult to get a wagon through.

20 In reading some of the descriptions of early
21 Arizona, there's one particular here from
22 Ciolek-Torrello and Welch in 94, and talking to folks in
23 the construction of Roosevelt Dam. They stated that all
24 of the men interviewed state that it was possible to
25 drive a wagon nearly anywhere one desired. So if you

1 had a wagon, you could take it anywhere. If you're
2 going through a dense forest, it really wasn't a
3 problem. If you've driven to Globe and you've gone up
4 over Gonzales Pass, and as you see that sign that says,
5 Entering the Tonto National Forest, I don't know how
6 many times my out-of-town guests have laughed about not
7 being able to see the forest for the trees, or not being
8 able to see the trees for the forest, or whatever it is.
9 We have open terrain here, and it's easy to take other
10 means of travel over land.

11 Q. Also, if you were coming from one of those
12 cities in Arizona or from out of state by wagon or
13 horseback, and you hit a river that was navigable, would
14 you necessarily want to unload all of your goods, put
15 them on a boat, and then later down the river take them
16 off and have to reload them back onto a wagon if one
17 were even available to you?

18 A. Yeah. If you could even get your horse to get
19 on a boat and stay on a boat, and you certainly weren't
20 going to leave it tied to a tree and come back to it
21 later. So yeah, definitely is a consideration.

22 So there are many other factors involved. And
23 I listed them here, and I won't go through all of them,
24 but you may just not have a boat. You may not have the
25 materials to build a boat. Weatherwise, you may not

1 want to get on the river. I've been on river trips
2 where it's cold and it's rainy and it's unpleasant to
3 sit in a boat over the water, and it's 30 degrees and
4 snowing on you. You would much rather be on land. Some
5 people can't swim.

6 Other reasons, it's too much work. The load
7 you're carrying, you don't want to risk capsizing.

8 Some of our rivers were just in areas where
9 there weren't any people yet. And you've got to
10 remember, in early Arizona history, these rivers were
11 unexplored. There was no GPS. There was no Google
12 Earth. There was no website to describe what the river
13 looked like. You were going down there; this was a
14 first descent. You didn't know what was around the
15 riverbend. It's a much more difficult decision. Or
16 somebody built a dam and took out all the water.

17 First, some discussions about why they used
18 trains rather than boats to ship ore from the mines. It
19 seems like a fairly easy decision in my mind that has
20 nothing to do with whether you can boat the river or
21 not. Obviously, trains are faster. Steamboat engine,
22 if you look at some of the steamboats on the Colorado
23 description, they were very proud of having made 240
24 miles in twelve days.

25 Steam engine, that's an afternoon's work.

1 Cargowise, in a big canoe you can put 500 pounds of
2 stuff. In a steamboat, 500 -- 50 tons, sorry, 50 tons.
3 In a train, a single ore car has got 50 tons. So
4 clearly if you're trying to move ore, a canoe is not
5 going to be your vehicle of choice.

6 Trains go uphill. Trains can go 24 hours a
7 day not affected in the same way by weather, drought and
8 flood. Then the question comes up, well, then, the
9 rivers couldn't have been navigable because you put a
10 railroad alongside of it. They never would have put a
11 railroad alongside a navigable river. Well, they built
12 railroads alongside river valleys because the terrain is
13 flat, and it uses less energy for the railroad to move
14 up flat terrain as opposed to going up and around
15 mountains.

16 Sorry, I just need to catch up here a second.

17 Q. And I think we're on about slide number 72 or
18 should be going to it. We're on slide number 71 right
19 now.

20 A. So it's easier to build them along the
21 railroad, and it has nothing to do with the fact whether
22 the river is navigable or not navigable. The presence
23 of a railroad or any other kind of road next to a river.
24 You can drive an interstate highway up along the
25 Mississippi River. It doesn't mean the river is not

1 navigable.

2 U.S. 95 goes up along the Colorado, parallel
3 along the western border of Arizona. It has nothing to
4 do with the Colorado River being navigable or
5 nonnavigable. It's faulty logic.

6 Floating logs, again, not a lot of instances
7 of floating logs. Some. But in order to flow logs, you
8 need to have a market. You need to have logs, one
9 thing, next to the river. You need to have a river
10 that's deep and wide enough, and then you need to have
11 somebody downstream somewhere who wants logs. If you
12 don't have those things, you're not going to do a lot of
13 log floating. And still, you still have some accounts.

14 And by way of summary, the kind of boating
15 that we have in Arizona, we have instances of historical
16 boating, and you'll hear more about those in the
17 individual presentations. You have them on the Salt.
18 We have them on the Gila. We have them on the Verde.
19 And they occurred throughout the year. They're not
20 during, just during floods. These are during ordinary,
21 ordinary range and fluctuation of flow. The kind of
22 boats that were used for primary low draft boats. We
23 don't have any pictures of the Queen Mary sailing
24 anywhere in Arizona. These are low draft boats. And
25 primarily, they were used in the downstream direction.

1 But actual accounts is not a requirement. Only
2 susceptibility is required. So for susceptibility, what
3 kind of boat is required.

4 Q. And just for the record, we just finished with
5 slide 73. 63 through 73 largely illustrated some
6 examples of historic boating. Please go ahead.

7 A. Okay. Slide 74 right now.

8 The federal standard for boat type, there
9 isn't one. The Holt case states that pretty clearly.
10 There is no required type to demonstrate navigability.
11 It's just whether it was used in fact or susceptible in
12 its ordinary and natural condition as a corridor for use
13 in commerce.

14 When it comes to susceptibility, it's really
15 all about the depth. If it's deep enough to float a
16 boat, it's susceptible to navigation. Width is
17 generally not a parameter. It's not a limiting
18 parameter. Because if the river is deep enough, it's
19 going to be wide enough. Just in the natural
20 characteristics of rivers. Width is not going to be a
21 criteria if it's deep enough.

22 In the case law, navigability requirements
23 aren't that it needs to be navigable by every type of
24 boat. Clearly, there are lots of rivers that have been
25 found navigable that aren't navigable by every type of

1 boat. It does need to be a long enough segment so that
2 it makes sense to have a declaration. We can't have a
3 20-foot long segment of the river being navigable and
4 the rest of it nonnavigable.

5 Case law has also told us that obstacles,
6 minor obstacles are not important. It can also be
7 difficult. You can have some difficulty getting a boat
8 up and downstream. In fact, if somebody struggled to
9 get their boat upstream or downstream does not make it
10 nonnavigable.

11 And remember, most of these historical
12 accounts where you're going to hear somebody had some
13 level of difficulty were first descents in homemade
14 boats by people who didn't have a lot of boating
15 experience. So difficulty is not that unexpected, and
16 if you've done a lot of boating, you know that from time
17 to time you're going to have some difficulties.

18 What are the federal standards for
19 susceptibility? Well, this is a chart you've seen
20 before if you've read the previous Land Department
21 reports. This is table 8-1. We've seen it in a number
22 of our reports. It's from the Fish and Wildlife
23 Service. And they're saying in order to float boats,
24 these are the depths.

25 Q. And it's slide 76. Please go ahead.

1 A. This is slide 76.

2 It shows that for a canoe or a kayak, a half
3 foot depth is the minimum recommended. Rafts, drift
4 boats, rowboats -- and I would include flatboats in that
5 category -- is a foot. And again, these width rivers,
6 if you find a river that's a foot deep, it's going to be
7 6 feet wide. And power boats at 3 feet. And this is
8 data that you've seen other times before, and I concur
9 with that. And these are a standard that I used in
10 making my determination that the Gila River is a
11 navigable stream.

12 Q. Is that anything -- I know that you're not a
13 lawyer or a legal expert -- anything in the case law
14 that requires the operator of a boat down an Arizona
15 river to actually make a profit?

16 A. Not that I'm aware of.

17 Q. Please go ahead.

18 A. Some states have come up with their own
19 standards where they've said how are we going to look at
20 rivers. In Arizona, we went through that in the past 22
21 years, and those presumptions of nonnavigability were
22 struck down. Requires each river to be looked at
23 particularly. This is what we're doing and what we're
24 here to do this week.

25 In Alaska they use something they call a

1 criterion craft, where in the case of the Gulkana, both
2 sides stipulated that if you could get a powered boat
3 with a thousand pounds of gear in it that they would
4 consider it navigable. That was a stipulated clause for
5 the Alaska case. The state of Alaska would also argue
6 that much smaller boats and smaller loads would argue
7 for navigability, and those cases are ongoing.

8 Q. And are you doing work for the state of Alaska
9 at present?

10 A. I am.

11 Q. Please go ahead.

12 A. I'm doing navigability work for the State of
13 Arizona.

14 Q. State of Alaska, you mean?

15 A. What did I say?

16 Q. Arizona.

17 A. I am that, too, yes. But Alaska.

18 Q. Thank you.

19 A. Washington, the U.S. Geological Survey, I
20 believe it was, came up with some criteria where they
21 threw rivers into categories that are probably not
22 navigable, may be navigable, probably navigable. None
23 of those, as I understand, have been tested by court,
24 nor are they considered to be diagnostic. They're just
25 a screening, a screening tool. And those relate to

1 specific depths.

2 In Oregon, floating logs, dugout canoes have
3 been the basis of determining if a river is navigable.

4 Then we need to talk a little bit about
5 obstructions to navigability.

6 Q. We begin that on slide 78. Please go ahead.

7 A. Slide 78. And whether something is an
8 obstruction or not depends on the type of boat. So an
9 obstruction to a river barge could be a sandbar that's
10 8 feet under the water. An obstruction to a fully
11 loaded canoe 8 feet down wouldn't have made a bit of
12 difference. Also depends on the boater's experience.

13 This nice little drawing on the lower right,
14 you see these grizzly looking mountain men plunging
15 through the rapids with their poles, clearly
16 experienced, and --

17 CHAIRMAN NOBLE: Excuse me, Mr. Katz, now
18 would be a good time to take a break.

19 MR. KATZ: That's fine. Thank you very much.
20 What, about ten minutes or so?

21 CHAIRMAN NOBLE: Yes.

22 MR. KATZ: Thank you.

23 (Recessed from 10:16 a.m. to 10:33 a.m.)

24 CHAIRMAN NOBLE: Mr. Katz, why don't you
25 continue again and you might want to start at the

1 beginning of the obstructions and obstacles.

2 BY MR. KATZ:

3 Q. Right, we were on, I believe, slide number 78,
4 and you were beginning to give us a presentation,
5 Mr. Fuller, of the distinction between obstructions and
6 obstacles, and that probably would be a good place to
7 begin.

8 A. Thank you, yes. I was talking about the
9 obstructions and difference between an obstruction and
10 an obstacle, and it depends on the type of boat. You
11 can see the pictures on the left, what's an obstruction
12 to a barge may not be an obstruction to a kayaker or a
13 canoer, and similarly, it depends on their experience.
14 When a rookie boater looks at something and says, well,
15 I can't go around that, an experienced boater doesn't
16 think twice.

17 An obstruction is not the same thing as an
18 obstacle. An obstacle you go around. It's a challenge.
19 In some cases it might be part of the experience. In
20 fact, there are commercial enterprises that are built on
21 the obstacle. So commercial whitewater rafting, for
22 instance, if there are no obstacles, people don't want
23 to pay as much money and don't do it as frequently. So
24 in some cases those obstacles are the point.

25 Moving along to the next slide. Some of the

1 things that have been proposed as being obstructions,
2 such as rapids, beaver dams, waterfalls, sandbars,
3 strainers and sweepers. I'll talk about definitions for
4 each of these as I go along. Marshes, braiding, shallow
5 flow. Again, it depends on the type of boat.

6 And I've broken them down here between barges
7 or deep draft boats versus low draft boats, and what
8 might be an obstacle for one may not be an obstacle for
9 the other.

10 In my opinion, having done this work for 20
11 some years now, only if the flow were continuously and
12 regularly shallow would it be an obstruction.
13 Everything else is just an obstacle to go around. And
14 they're very intermittent spatially, and they don't make
15 up much of the river. And I'll talk about each of
16 those.

17 Rapids, let's go through them individually.
18 Rapids are defined as the section of river where there's
19 an increase in some velocity or turbulence so we get the
20 whitewater in some cases.

21 Some rapids are formed if there's a slope
22 increase, but not all. Sometimes it's just a
23 constriction of the river. It gets narrower. Other
24 times there are shallow and exposed rock, and sometimes
25 those features create whitewater or frothy water that we

1 associate with rapids.

2 And most rapids are simply obstacles. They're
3 not an obstruction. Again, it depends on the boat type
4 and whether that boat is suitable for use in situations
5 where there are rapids.

6 If the rapid were long, continuous, major
7 rapids, that could be an obstruction, particularly for
8 some kinds of boats. And it could be certainly an
9 obstruction to upstream travel of some kinds of boats.

10 There is, fortunately, a scale of rating for
11 rapids. It goes from I to VI. A Class VI rapid would
12 be nonboatable. As soon as people regularly start
13 boating a Class VI, it becomes a V or lower.

14 But by definition, classifications of I
15 through V are navigable. They're describing the degree
16 of difficulty, not whether you can or you can't. If you
17 can't navigate it, it's a Class VI.

18 The rapids rating scale on slide 81 here is
19 built on the ease of passage. How difficult it is. How
20 difficult it is to get through, to find a route, the
21 size of the waves that might be present, the complexity
22 and the need for maneuvers in the rapid. What kind of
23 boating skills are required. If there's a danger if you
24 fall out of your boat and swim, that could contribute to
25 rating a rapid higher than lower. And the difficulty of

1 rescue if someone were to become trapped.

2 These ratings are quasi-objective. There's
3 some subjectivity, and if you're a boater, you've
4 probably spent some time at a campfire after a day of
5 boating or at the bar afterwards having a discussion
6 about, well, do you think that was a III or a IV or a II
7 or a III. So there's some subjectivity there. And it
8 also depends on the season. So at higher flow some
9 rapids wash out and are no challenge at all. Sometimes
10 at higher flow they become more intense. So there can
11 be some fluctuation there. Again, by definition, I
12 through V are navigable.

13 There's only a few Class IIIs and IVs on the
14 rivers that are under consideration by ANSAC.

15 Mostly the rapids are Is and IIs, which are
16 novice level boating. I also point out that the
17 navigable Colorado River has some of the largest rapids
18 in North America.

19 Even on a river with rapids in Arizona, most
20 of the river is not rapids. So we have typically pool
21 and riffle sequences where most of the time, even if
22 you're on the Grand Canyon and some of the most exciting
23 whitewater in the world, most of the time you're
24 floating and staring up at the cliffs. A very small
25 minority of the time, probably less than five percent,

1 you're in some kind of a rapid.

2 Q. And if I were a commercial pilot or a trader
3 or a trapper, I would have higher than novice level
4 skills adaptable to my trade?

5 A. If you're still alive.

6 Q. Understood. But it's not --

7 A. Or dry.

8 Q. But by way of comparison, I might be a decent
9 automobile driver but couldn't handle a semi full of
10 goods unless I were specially trained or experienced?

11 A. Yeah, you can't underscore the importance of
12 experience. And I think that the analogy to driving is
13 a good one. Having taught my daughter to drive, I would
14 find that a harrowing experience the first several
15 times, but now she's an experienced driver and has an
16 excellent driving record. So similar with a boat. Your
17 first time in a boat, steering in a rapid is like going
18 through Sky Harbor Airport when you're 16 years old,
19 first time behind the wheel. But with experience, it's
20 no problem at all. Not even noteworthy.

21 This 95 percent figure is based on our
22 measurements of the length of rapids on the rivers in
23 Arizona. The Verde River has not yet been compiled, but
24 again, from looking at the preliminary results, it's
25 less than five percent. But you can see by class level

1 of rapids they represent a significant minority of the
2 various rivers, particularly for the Gila. The Gila has
3 very few rapids at all. They're very short and tend to
4 be small drops.

5 Q. And we're looking at slide 83.

6 A. The classification scales, I, II and III. I
7 would classify, I would say most people agree that
8 Class Is are just fast-moving water and they're
9 pre-novice. If someone knows how to sit in a boat and
10 use their paddle, they can get through.

11 Class II, still novice, know a little bit
12 about steering a boat and pointing it in the right
13 direction. Generally they're wide, clear channels.

14 Class III, you're going to require some
15 maneuvering. There might be some waves in tight
16 channels, but with experience these are routinely,
17 routinely navigated.

18 Let's look at some pictures. It's great to
19 look at PowerPoint bullets, even better to look at
20 actual pictures of rivers.

21 This is the Verde River. It's an unnamed
22 Class I rapid. Took a little trip through here and you
23 can see various canoes going through with no particular
24 issue at all. A fellow just had his son in the boat in
25 front of him here, not even carrying a paddle.

1 And let me just show you a video. This is
2 Clay Bank's Rapid. It's a Class I rapid on the Verde
3 River, called the Verde Daily section. That was one of
4 his first trips in a kayak right there. You'll see
5 another boat coming through in just a second. We had
6 seven boats on this trip. We all successfully navigated
7 this Clay Bank Rapid. That's what a Class I rapid looks
8 like. It's not much adventure to it at all. Point your
9 boat in the downstream direction. Go around the rocks,
10 or the obstacle in this case, do a little bit of
11 steering. Class I boater. Showing off for the camera.

12 Q. And was this taken on unusually high river
13 flows?

14 A. This was 122 CFS on the Verde, which is well
15 below its long-term median flow.

16 Nathan right here is paddling with his
17 daughter sitting in a chair. She didn't want to hold a
18 paddle. They came over to visit me, backed off and
19 continued down the river.

20 And our last boat here is Cory and his son
21 Joey. Joey is five or six years old. Cory is a good
22 boatman. I lost my place. That was Clay Bank. That's
23 Class I.

24 Class II, this looks like the Gila River
25 Needle's Eye Rapid in the canyon below. San Carlo

1 Reservoir, Coolidge Dam. This is a canoe trip at 220
2 CFS in February, I believe this was. Again, a little
3 bit of maneuvering. Tandem canoe loaded with gear for a
4 three-day trip. Woman in the front. This was her first
5 river-boating experience. Very old man in the back is
6 me. This is the Wenonah Cascade canoe.

7 Q. And again, was this an unusually high water
8 flow?

9 A. No, it was 220 CFS. No, it's well below the
10 historic ordinary and natural median discharge.

11 Q. When you say median, that would be in the
12 middle, not in flood or drought?

13 A. Half the time it's above that. Half the time
14 it's below. I'm not saying 220 CFS is that. And I'll
15 get to those flow rates in a later presentation, but
16 this was not an unusual, an unusually low, and certainly
17 not unusually high.

18 I'm sorry, I don't have a video at this time
19 of Class III. I've paddled many Class IIIs, and I just
20 don't have a video. Just never stopped and took a
21 video. I thought I had some lined up and didn't show
22 up.

23 But I have some pictures of canoes in Class
24 IIIs, the Eye of the Needle Rapid on the Salt River
25 which is Class III. It's different than the Needle that

1 we just saw.

2 This upper Salt River Canyon. Ledges Rapid
3 below that. This is actually a canoe playing on the
4 surf wave in the rapids, and then you can see an
5 inflatable raft in the background.

6 Class IVs and Vs, water starts to become a
7 little more serious. Need more advanced skills to get
8 through. There's more consequence if you fall out of
9 your boat or the boat tips over. But again, those just
10 require more skills, not to say that they're not
11 boating. A Class VI would be an obstacle.

12 This is what a Class IV rapid looks like on
13 the ground. This is Black Rock Rapid on the upper Salt
14 River at about 1600 CFS, and going through this one I
15 have a little bit of video on from a raft trip, and I
16 don't have any canoe video there. There are canoe
17 pictures. People do canoe that. It's not unusual to
18 canoe Class IV rapids. I've canoed many myself. I have
19 a little bit of a video to look at if it cooperates.

20 There it is. It's big water. There's some
21 big waves. You can see the white boat that I'm in.
22 Just point it downstream and go on through.

23 Q. And would 1600 CFS be median flow or higher
24 than median flow?

25 A. That would be a little above median for the

1 upper Salt.

2 My understanding though is -- when we get to
3 the upper Salt, we'll talk about this in detail. But in
4 talking to the river ranger up there, people raft it as
5 low at 350 CFS, which is well below the long-term
6 median.

7 Q. Would it still be a Class IV rapid at that
8 flow rate?

9 A. That's something that people would argue
10 about, but that's how it's rated, yes. There aren't any
11 Vs and VIs on any of the rivers you have left to
12 consider.

13 The only Class Vs in Arizona that I'm aware of
14 are on the Colorado River in the Grand Canyon or on some
15 of the smaller rivers, which are not under consideration
16 for navigability as far as I know.

17 Another obstacle is beaver dams. I've seen a
18 lot of testimony about beaver dams.

19 Q. Just for the record, the boating slides were
20 85 through 95, and we're now beginning, I believe, on
21 96. Go ahead.

22 A. Correct.

23 Beaver dams are not a feature on any of the
24 major river systems you have left to consider with the
25 exception of the Verde above Perkinsville. They just

1 don't build dams across the river. Those are small
2 river features, and they tend to be removed by seasonal
3 higher flow, and on the larger rivers I've never seen a
4 beaver dam on all my trips on any of those rivers. They
5 tend to live on the banks. You see a lot of beaver
6 signs, gnawing on trees and whatnot, but it's just not a
7 consideration for certainly the Gila that you're
8 thinking about this week. And even where there are
9 dams, they're really not obstructions to small boats.
10 You either ride over them like you see in the lower
11 right there, just paddle right across it or you get out
12 of your boat, slide the boat over the top of it and you
13 get back in your boat and you keep on your journey.
14 They're really not an issue at all.

15 You do see some beaver lodges occasionally.
16 This is on the Gila River below Phoenix, downstream of
17 Phoenix in the area that's now dominated by effluent.
18 So you know that there are beaver out there.

19 Waterfalls is another type of obstruction
20 which is a river flow over a vertical drop. Something
21 that's not drowned out at higher flow. It's a permanent
22 feature. Rapids are different from waterfalls in that
23 they are less steep and may be drowned out at higher
24 flow. There are no waterfalls on any of the rivers you
25 have left to consider. There are some rapids that are

1 called falls, for instance, Apache Falls on the Salt
2 River Canyon upstream of US-60 Bridge and Verde Falls in
3 the whitewater section of the Verde below Beasley Flat.
4 But those really aren't falls. It's fairly common for
5 rapids to be called falls, but I would not classify
6 those, as both of those tend to be drowned out at higher
7 flow. Regardless, people boat them, and neither of them
8 are Class Vs. They're Class IVs.

9 So there are none on the remaining rivers, and
10 people often run the Verde Falls in canoes, kayaks and
11 rafts.

12 Sandbars, another thing we've heard proposed
13 is obstacles or obstructions. You can see on the left
14 here, this is what a sandbar looks like on the Gila
15 River upstream of the Gila Box. It's basically just a
16 deposit of sand on the side, and you go around it. You
17 go where the water is. It's really no difficulty there
18 in getting around them.

19 Submerged sandbars occur in some places. This
20 is an example from the Colorado River, and
21 unfortunately, the slide doesn't appear very well.
22 Right here you see underneath some lighter-toned water.
23 It's shallower. But again, sandbars are a feature that
24 the historic steamboaters noted as being present, and
25 they were just an obstacle, something to be dealt with.

1 I tried to find some pictures from Arizona where you had
2 some river-wide sandbars, and I just couldn't. So I
3 gave you a picture from the Cimarron River in Oklahoma.
4 And that's what they look like. It's just shallow
5 water.

6 They occur on all major rivers. They're
7 really not a significant issue at all. And again, if
8 you've read your Mark Twain, you know that was the glory
9 of being a riverboat captain was knowing where the
10 sandbars were and how they had moved and where you
11 needed to put your boat, and they certainly don't
12 preclude navigability. You just go around them.

13 Q. Let me just ask you, in your boating
14 experiences over the last 20 plus years on Arizona
15 rivers, Gila, Verde and Salt, have you ever had to get
16 out and portage with a fully-loaded canoe or even a
17 partially-loaded canoe because of sandbars?

18 A. No.

19 Q. Go ahead.

20 A. Not once. The Wheeler Expedition, which went
21 up the Colorado River to Diamond Creek well into the
22 whitewater, some of the most significant rapids at that
23 time, also dealt with sandbars. There's a picture from
24 Webb's book in 2007. They occurred. Some of them were
25 big. You could camp on them like Wheeler did.

1 Another type of obstruction or obstacle, I
2 should say, is strainers. Strainers in some the
3 historic literature they're referred to as Sawyers. But
4 basically it's a tree that are branches that are leaning
5 into or fallen into the water, and the water goes
6 through like a sieve through those branches. And they
7 can become an obstacle to get around. You see a lot of
8 them on the Gila River below Coolidge Dam. The lack of
9 floods down there is -- the floods kept them cleaned
10 out. So you see more of them now than perhaps in the
11 past, and they're basically a hazard only to the
12 unprepared. So if you go down the river and you're not
13 thinking about those things, you take your boat into
14 them, it's possible you could tip your boat over. But
15 you tip your boat back up and dry off your gear and you
16 move on down the river. Basically, if you've had a
17 problem with a strainer, you were not prepared, and you
18 were inexperienced or not paying attention. Very easily
19 avoided for experienced boaters.

20 And again, when it comes to obstacles, you
21 just go around. And the way you go around is either you
22 find a deeper channel or you need to get out of your
23 boat, you hang onto the ends, tie a rope to the ends,
24 and it's called lining your boat through it. Sometimes
25 you stay in your boat and you give it a little skooch,

1 and throw your hips and move it on down the river and
2 you're past. Sometimes you get out of your boat and you
3 just drag it. And which particular solution you choose
4 depends on your skill and your knowledge of the river
5 and what's coming next.

6 Q. But you're not talking about unloading the
7 canoe and hiking 50 yards or a mile or two for purposes
8 of what would be called portage?

9 A. No, that is what I would call portage, and I
10 would distinguish that from lining, scooting or
11 dragging. That's a different exercise.

12 Q. Right. But that's not what you're doing when
13 you're lining, scooting or dragging?

14 A. No. Portaging is carrying the boat over land,
15 on slide 105 here. And there could be short hauls or
16 long hauls. There are lots of canoe routes in the
17 United States that were used by trappers that included
18 long portages, a mile or longer, where they went from
19 one river across a divide to another river. The fact
20 that someone is portaging, it may be because they're
21 going from a river to another river or they're going
22 around a particularly steep obstacle. But again, that
23 decision whether to portage, to run it or line it or do
24 something else is a consequence of the weather. What
25 the consequence of making your choice might be, how risk

1 averse you might be, whether you're tired.

2 I have decided to portage Verde Falls on the
3 rapid because I was carrying my six-year-old son along
4 with me and decided that if I were to flip over, I would
5 have no problem, but I'm not sure I wanted my
6 six-year-old in the water with me. So we decided to
7 carry around it. We didn't unload our canoe. We just
8 pulled it to the side, lifted up, carried it off down to
9 the end of the rapid and put it in.

10 Q. But not out of necessity, but out of safety?

11 A. Out of safety. It's also going to depend on
12 the skill. It's going to depend on the durability of
13 your craft. If you're in a canvas boat and it's
14 particularly sharp rock, you might want to portage
15 around it if there was not a deep enough line.

16 So there's lots of different factors that run
17 into that, and I would put that into the occasional
18 obstacle as opposed to the rule.

19 The role of experience, Wesley Powell's trips
20 underscore the role of experience. When he made his
21 first trip in the 1860s, they portaged or lined 62 of
22 the 476 rapids. In the process, they damaged a bunch of
23 boats. They sunk at least one. The replica trip that
24 went down last year, they built the same boats, had the
25 same equipment, but they had more experienced boaters,

1 more knowledge of the river, people who had been down
2 the river before, and they ran all but one rapid. And
3 the one rapid they portaged -- and I believe it was
4 Crystal Rapid in Grand Canyon -- they did it for the
5 experience to see what it was like for Powell and his
6 associates. And they found it to be quite an onerous
7 task and decided not to do it again. So they ran all
8 the rest, and they had no, no damage. A very different
9 experience, they had a different river experience
10 because of their experience on rivers.

11 Things I would not classify as obstructions,
12 one would be remoteness. And my argument for that is in
13 1912 and certainly earlier when the rivers were in their
14 ordinary and natural condition, the entire State of
15 Arizona was remote. It was kind of an out-there sort of
16 place. I would say a deep canyon is not also an
17 obstruction. That's a feature of the geology
18 surrounding the river, not the river itself.

19 And narrow rivers, I know of no Arizona rivers
20 that you're still considering that are too narrow for a
21 boat.

22 Also, manmade features are not obstructions
23 because we're considering the river in its ordinary and
24 natural conditions.

25 And again, the Holt case has this language

1 saying, "Nor on an absence of occasional
2 difficulties..." Saying occasionally having to do
3 something to get around an obstacle does not prevent
4 fluid navigability.

5 Which brings us to modern recreational boating
6 and its implications for navigability.

7 VICE CHAIRMAN HENNESS: Excuse me, Jon, in the
8 pictures in regard to the upper Salt, was that prior to
9 the dynamiting of the obstruction in the river or after?

10 THE WITNESS: Mr. Chairman, Mr. Henness, the
11 question was, was it prior to the -- they blew
12 Quartzsite Falls. I forget the name of the individual
13 and year he did that, but these photos are, I believe,
14 after that; but none of the photos that I provided were
15 of the Quartzsite Falls rapids. Black Rock is upstream
16 and would not have been affected by the blasting of
17 Quartzsite, and all of the other rapids I showed you
18 were also upstream and would have no effect. It's just
19 too distant from there to have any impact.

20 VICE CHAIRMAN HENNESS: But evidently, it was
21 an obstruction in some people's mind?

22 THE WITNESS: It was an obstruction in the
23 sense that people slowed down and there got to be a
24 bottleneck of rafts, and one of the reasons they blew it
25 was to make it easier.

1 VICE CHAIRMAN HENNESS: And the people that
2 blew it were not Salt River Project people, were they?
3 They were rafters?

4 THE WITNESS: My understanding -- I don't
5 think Mark would admit -- no, no, they were not. They
6 were rafters. And I believe they served jail time
7 for -- at least one of them did.

8 VICE CHAIRMAN HENNESS: Good. Thank you.

9 THE WITNESS: Thank you for the question.
10 Which brings us to modern recreational
11 boating, and on the homestretch for this presentation
12 here.

13 BY MR. KATZ:

14 Q. And just for the record, the obstacle sections
15 we were dealing with, I believe, were the slides 96
16 through 106.

17 A. The Montana PPL case, the Supreme Court spoke
18 specifically about consideration of modern recreational
19 boating as evidence for navigability, for title
20 navigability, and it basically outlined two criteria.

21 One was that the modern watercraft are
22 meaningfully similar to those in customary use as of the
23 time of statehood. Specifically, can modern boats go
24 where historical boats couldn't. Also, has the river's
25 condition changed. Is it materially the same or is it

1 materially different from statehood condition. So has
2 the river changed substantially to improve boating. Is
3 it less torrential during floods. Is it wetter during
4 low flow periods. So we want to consider the record of
5 boating with those two criteria in our heads.

6 So the first one, are the boats meaningfully
7 similar. And as Paul pointed out via a question
8 earlier, basically the draw of the boats is the same.
9 Physics hasn't changed that much and the principles of
10 buoyancy have not changed. The same depths are needed
11 for historical and modern boats. The weight of the
12 canoes, for instance, is about the same. The design is
13 essentially the same.

14 I show you a picture of a canoe from 1912.
15 You're going to look at it and say oh, that's a canoe.
16 And if I show you one next to a canoe from 2014, you'll
17 say oh, those things look very similar. In fact, the
18 physics were the same. It's just displaced water.

19 And in this slide here, we see a picture of a
20 man from 19 -- I'm sorry, I didn't write the date down
21 here. A historic photo of, I believe from 1910, poling
22 a canoe through some minor rapids, and we see a picture
23 from 2013 of a young woman polling a canoe through some
24 rapids. So basically the principles there are just
25 about the same in terms of the performance and draw of

1 those boats.

2 Here we see some side-by-side pictures. The
3 canoe on the left is from 1912. The wooden and canvas
4 boat. And we see a wood canoe here on the right. And
5 they looked practically identical in shape, design, and
6 displaced the same amount of water.

7 A fair amount of recreational boating occurs
8 in replica boats where folks, in this case, that have
9 built replicas from the Kolb brothers from Grand Canyon,
10 a replica of their Edith boat in 2013 compared to the
11 original boats in 1911 taken down the Grand Canyon. So
12 those boats are not only meaningfully similar, they are
13 the same.

14 If we look at inflatable boats from the 1850s
15 versus inflatable boats from 2014, again, the design is
16 just about the same. And again, other boats.

17 Q. And we've gone from 108 through 114. I
18 misspoke a minute ago. The earlier presentation went
19 through slide 107. Go ahead, sir.

20 A. So am I saying that boats haven't changed at
21 all in the last 102 years? No, of course not. The
22 durability has improved significantly. We now have
23 plastics, Hypalon, other sorts of modern materials that
24 are more durable. So basically the difference is you
25 need a little less skill because you can bounce off

1 things you couldn't bounce off before. So it allows
2 people who are not as skilled an entry into an activity
3 that they would have had more consequence being involved
4 in a hundred years ago. But, however, at the time the
5 people who were using those older, less durable boats,
6 low durability was an expectation of those. When you
7 went out in your canvas canoe, you brought a canvas
8 canoe repair kit with you. And in watching a video of
9 the history of canoeing in the southeast, I was
10 surprised to see a chapter on canvas canoes going down
11 these rivers, and the gentleman was talking about we get
12 done with our day, we take the boats back, we flip them
13 over, and we do any repairs that need to be done to the
14 canvas. They'd sew it up and they'd be back boating
15 again the next day. And they also noted that they took
16 a little more care in selecting their route. So they
17 might stop and scout something back then that they would
18 now run without thinking because there's less
19 consequence.

20 Q. And you mentioned canvas, but if someone were
21 in a wood boat, whether it was a Native American in a
22 dugout canoe or a trader or a trapper in a wood canoe,
23 would they be prepared as a general rule to repair a
24 boat if they punched a hole in it?

25 A. They would. And in fact, that's a great segue

1 to the next slide. You see the Kolb Expedition from
2 1911 in the Grand Canyon. And you can see here in the
3 upper left a picture of the Kolb brothers. And you see
4 one of them -- I don't know if it's Ellsworth or
5 Emery -- sticking his head through the hole that they
6 bashed in the bottom of their wooden boat. So they're
7 there in 1911 at the bottom of the Grand Canyon on
8 Christmas day. And they, in fact, sealed it up, had
9 some wood along to repair it, put on the patch, covered
10 the patch with a lead -- a piece of lead which you can
11 see if you go look at the boat today in the archives of
12 the Grand Canyon. It's still there. Fixed the boat,
13 finished their trip.

14 The Stone Expedition, I believe, or perhaps
15 the Wheeler actually got down, decided their boat was
16 too long, and they cut it in half. They took out
17 several feet, rebuilt it -- this was in 1910, the bottom
18 of the Grand Canyon -- with hand tools and continued
19 their trips. So repair of boats was something that
20 experienced boatmen were prepared to do. Their
21 expectations of durability are different than ours, but
22 they're basically doing the same rivers.

23 In terms of depth requirements, modern canoes,
24 half foot or less. Canvas canoes, even less. Canvas
25 canoes are historic boats. Drift boats, about a foot.

1 Duck boats from the 1910 catalog, two tenths of a foot.
2 Kayaks, less than half a foot. Rowboats, about a foot,
3 and it just doesn't change. So meaningfully similar is
4 the question? Yes.

5 Q. And again, we were dealing with slide 116 with
6 respect to those standards, and before that the patching
7 of the Kolb boat was 115.

8 Go ahead and explain the next slide. I think
9 you were about to 117, and perhaps looking at the canoe,
10 explain what those measurements mean.

11 A. Yes. This chart right here is developed by
12 navigability experts in the state of Oregon for a case
13 recently decided -- I think it was the Umpqua River in
14 Oregon -- and they were looking at what are the
15 requirements for a historic dugout canoe, and they were
16 saying 8 inches, and then they looked at a variety of
17 more modern recreational boats and demonstrated through
18 their experiments that the draw was about the same.

19 So you're looking at the boat, looking
20 head-on. The width that they're saying that was
21 required, the depth over here, about 8 inches in all
22 cases, and then they also put on additional criteria
23 that the river should be as wide as the boat is long.
24 Basically that allows you to do a spin maneuver.

25 Q. But if there is a short section of the river

1 that's narrower than the boat, but -- not narrower than
2 the boat, but not as wide as the length of the boat, you
3 still could navigate through it?

4 A. That occurs infrequently, but yes, you could.

5 The second question the Court asked us to look
6 at, has the river condition changed, materially changed
7 or improved. And speaking in general about Arizona --
8 and I'll discuss them more specifically in the
9 individual river presentations, but the general answer
10 is no. Have not improved at all. In fact, they have
11 deteriorated, because we've taken the water out.

12 The flow rates are significantly depleted. I
13 think you'll find that all experts agree on that,
14 regardless of their opinion about navigability, and that
15 the flow depths are lower. I think that's also an area
16 of general agreement.

17 We've also had changes that relate to the
18 altered flow regime and their role in bringing in
19 invasives and favoring the propagation of invasive
20 species like tamarisk and the effects that they have on
21 creating more strainers and more obstacles that did not
22 exist.

23 Then, of course, then you've got all the
24 man-made changes to the river -- fences, dams,
25 channelization, and mining -- also create obstructions

1 that did not exist in the ordinary and natural
2 condition.

3 So modern recreational boating is evidence of
4 susceptibility. You can boat it today. You could boat
5 it even more in the past, given the time, the
6 opportunity, and the motive to do it.

7 I would also argue that modern recreational
8 boating is travel on water and thus meets the Daniel
9 Ball Test. I also would argue that recreation is
10 commercial.

11 Commercial river touring existed in 1912. The
12 Stone Expedition down the Grand Canyon is evidence of
13 that. There are tourism-based economies. Talk to the
14 folks in the Verde Valley and the number of people that
15 come up to visit the river and paddle. There are places
16 that provide boat rental, supplies, scouting, guiding,
17 outfitting. Meals and gas when you're on your way to
18 and from the river.

19 And as I pointed out in the Utah Special
20 Master's report, the occurrence of future uses was one
21 of the reasons of preserving these corridors of commerce
22 for navigable streams.

23 Q. So it wasn't only current use; it was the
24 expectation or possibility of use in the future in the
25 river's ordinary and natural condition?

1 A. That's how I read the purpose of navigability,
2 yes.

3 Arizona, modern recreational boating also
4 incorporates federal monitoring and regulation of
5 boating, keeping track of who is on the rivers and allow
6 or disallow use of the rivers. There are commercial
7 outfitters using our rivers. There are published river
8 guidebooks that tell us how to get down the rivers.
9 Places that offer boat rentals. Plenty of websites that
10 are providing commerce regarding the use of rivers and
11 the equipment for rivers. There are plenty of paddling
12 clubs with many members frequently using these. There
13 are boat races on the Verde and the Salt. And there are
14 places that provide shuttle services for modern
15 recreational boating that are also commercial
16 enterprises.

17 The ones that are currently still in today's
18 condition in the post depleted flow rate that are still
19 being boated include the Gila Box, which I will call
20 Segment 2 that we'll talk about later. The Gila River
21 below Coolidge Dam all the way down to the Ashurst-
22 Hayden Dam. The Gila River downstream of Phoenix,
23 believe it or not, people are out there canoeing and
24 boating in low water. And Salt River Canyon, of course,
25 lots of commercial activity that's focused particularly

1 on spring and the late winter snowmelt, but there are
2 people boating in there year-round. And the Verde, the
3 entire Verde all year-round. Pretty much any Saturday
4 you go there, you're going to find people on boats using
5 the Verde River, as well as a number of other rivers.
6 Basically if there's water and you can get there, people
7 will boat it.

8 Most of the boating occurs in the most scenic
9 areas, the places that are most fun, and it's going to
10 depend to some degree on the flow rates.

11 So, to wrap up this presentation, my summary
12 is that boats were available in Arizona at statehood.
13 There was a wide variety, primarily used on the river
14 that you're considering today, and in the future are low
15 draft boats. There are many accounts of people using
16 these rivers with boats for a variety of commercial uses
17 in an historic period, and they are still used today.
18 Evidence of their continuing susceptibility to
19 navigation, and this modern use is meaningfully similar
20 to those used in historic times. And that concludes my
21 presentation on boating in Arizona.

22 Q. Okay. And we're going to then be
23 transitioning into your second presentation, which
24 specifically deals with the Gila River and its
25 segmentation as is required in both the Winkleman

1 Arizona case and the PPL Montana case that you mentioned
2 a little bit earlier, correct?

3 A. That is correct.

4 Q. And your second presentation, I believe, is
5 also in Exhibit X020.

6 And just one last question. It's hoped that
7 we won't go through this boating presentation a second
8 time or a third time on the remaining adjudications
9 unless there's some additional or supplemental
10 information that might be specific to a particular river
11 that we are discussing; is that correct?

12 A. Well, I can't speak for my audience, but I
13 know that's what I hope.

14 MR. KATZ: Okay. And we would ask the
15 Commission, even if we don't present this again, to
16 consider the boating presentation in all of the future
17 adjudications as evidence that we are tendering or
18 offering.

19 And we're ready to go forward, Mr. Chairman.
20 We can have Mr. Fuller begin his Gila River
21 presentation.

22 CHAIRMAN NOBLE: Please continue.

23 THE WITNESS: All right. Here we go. Again,
24 please ask questions as you have them.

25 VICE CHAIRMAN HENNESS: Jon, let me ask you

1 one question. I'm curious, all of your talk was about
2 going downstream, basically, that I've heard here today.
3 Now back to that boulder that you folks blew up in the
4 river, wouldn't that have been a major obstruction in
5 regard to commerce in both directions on the upper Salt?

6 THE WITNESS: I think there were two questions
7 in there. I'm recalling the second one. Yes. Getting
8 around Quartzsite Falls in the upstream direction would
9 have required getting out of your boat. So yes. But
10 the occasional difficulty, I would put that in the
11 classification of the occasional difficulty.

12 I would also grant you, the first question was
13 most of the accounts were in the downstream direction.
14 That is also correct. Most of the historic use, almost
15 all of the modern recreational use is in the downstream
16 direction. That is a correct statement. On the Gila
17 River, as we'll see, there's a little bit of documented
18 upstream historical use. So yes, the answer is yes.

19 I would also point out that, as I noted on the
20 Salmon River, they were using sweep scows exclusively in
21 the downstream direction. Their expectation was to do
22 their trade and travel, get to the bottom, sell their
23 boat for lumber and scrap, take some other means of
24 transportation back up. Take another boat, yeah. Build
25 a boat, take it down.

1 VICE CHAIRMAN HENNESS: But it was an
2 obstruction, you would agree, going back upstream?

3 THE WITNESS: It's an obstruction in the sense
4 that you need to go around it. Yes.

5 VICE CHAIRMAN HENNESS: Thank you.

6 BY MR. KATZ:

7 Q. And just one follow-up question, if I might.
8 I know that you're not here to render legal opinions,
9 but you've talked a little bit about your understanding
10 of Daniel Ball and you've mentioned the Utah Special
11 Master's Report. Do you understand whether or not
12 there's a requirement that you have to be able to
13 navigate a river both upstream and downstream for it to
14 be considered navigable within that Daniel Ball Test?

15 A. In the Daniel Ball Test, as I read it -- that
16 would be my first slide right here -- there's nothing
17 about upstream travel.

18 Q. And was it unusual in the West for traders,
19 trappers and others to use boats downstream but other
20 means of transportation to get back upstream?

21 A. That's my understanding of the record and what
22 I've read is it was fairly common for low draft boats to
23 be used in one direction only.

24 Q. And was it unusual for people that might
25 professionally boat a river to build their boat, whether

1 they're Native American or settlers, at the scene or
2 near the scene of where they're going to begin their
3 boating trip?

4 A. No, that was not unusual at all.

5 Q. If you would, please feel free to begin,
6 unless there are additional questions, your Gila
7 presentation.

8 A. Okay. This begins our presentation on the
9 Gila River navigability. And again, we start with the
10 Daniel Ball Test, as Paul just mentioned. We want this
11 to be our touchstone. As we're looking at the evidence
12 that's available. Does the Gila River -- and I'm
13 speaking specifically of the Gila River, not Arizona in
14 general, just the Gila River. Does it meet the criteria
15 that are outlined here? And what are those tests that
16 in this ordinary and natural condition it was used or
17 susceptible to use for trade and travel on water?
18 Customary modes.

19 We also want to give deference to recent
20 Arizona court decisions, one of which relates to the
21 upstream use. That was one of the -- what's the word
22 I'm looking for? I'm sorry.

23 Q. Rulings or holdings?

24 A. No, no, it was the presumptions of
25 nonnavigability that was struck down by a previous

1 Arizona court as not being a definitive criteria.

2 Q. So there's no presumption of navigability or
3 nonnavigability with respect to Arizona rivers?

4 A. That's what I understand, correct.

5 And also, of course, the U.S. Supreme Court's
6 decision on river segments. So I'll be presenting
7 information on that.

8 All right. By way of background, reports
9 prepared previously in 1992 is when this all started,
10 for me at any rate. The Land Department was directed to
11 prepare reports to provide technical support for ANSAC,
12 collect facts and present those facts regarding
13 navigability of various Arizona rivers, the Gila River
14 being one of them.

15 The original report was done by the Land
16 Department internally, in-house, and the upper Gila
17 River above Safford was done by a team of consultants of
18 which we were a part of that team.

19 Subsequent to those first reports, they were
20 revised pending changes in the Arizona legislation. We
21 were in charge -- I was personally in charge of those
22 revisions each time they were done. We also did
23 navigability reports for all stream segments in the
24 State of Arizona. That's more than 30,000 of them. But
25 the Land Department has only advocated for navigability

1 on the Salt, Gila and Verde.

2 Q. And just for the record, as I mentioned
3 earlier, the earlier evidence of those original reports
4 were evidence, Exhibit 1, part 5 and part 14, if the
5 Commission wishes to review those reports. And they
6 were updated later in 2003 in Exhibits 2 and 4 from the
7 earlier adjudication. Please go forward.

8 A. And the other thing that you should note here,
9 in the past testimony prior to the last hearing, we were
10 directed to be fact witnesses, stand up and say these
11 are the facts and not to draw conclusions as to
12 navigability. And I'm here today with a conclusion
13 regarding navigability based on my experience over the
14 last 20 some years looking at this river, both from the
15 historical susceptibility standpoint and my own personal
16 experience boating rivers.

17 The previous reports for the Gila, as I
18 mentioned earlier, were not updated. This report, this
19 presentation serves as that update.

20 Note on the evidence, not all of the evidence
21 submitted by the Land Department is going to be
22 discussed today. I'm sure there's some relief on your
23 part. I'm going to try to hit the highlights. And we
24 like to incorporate all the evidence previously
25 submitted for the Gila River and other rivers, have that

1 available as it applies to the Gila or the post-hearing
2 reports.

3 We talked about my resume earlier, and I won't
4 go through that again. I've been doing this a long
5 time.

6 Before we jump into the Gila River
7 specifically, I have a few other introductory type
8 things that don't really fit in the boating
9 presentation, so I'm putting them here; and again, my
10 intention is to go through these as foundational, and
11 then when we come to our next rivers, hopefully not have
12 to rehash these particular slides.

13 But it's very important for us to be talking
14 about the same terms, to use the terms in the same way
15 as we discuss these rivers, because there's some
16 confusion in terminology that's resulted in some faulty
17 conclusions.

18 The first term I want to talk about is the
19 floodplain. The floodplain is just an area, part of a
20 watercourse that gets covered by water, flood water.
21 That definition is given in a different part of the
22 Arizona Revised Statutes, but the important part is that
23 the floodplain includes a low flow channel. It's not --
24 the entire low flow channel is not the floodplain.
25 There's the floodplain and a portion of that is a low

1 flow channel.

2 The low flow channel is what I would call the
3 boating channel. It's the part where water is most of
4 the time, at least in its ordinary and natural
5 condition, if the water hasn't been removed. So there
6 are parts that are more frequently inundated or
7 ordinarily inundated, and there are parts that are not
8 ordinarily inundated. That's an important distinction.

9 So what's the channel then? A channel is
10 simply a conveyance or a corridor of surface water that
11 has a bottom and sides in some sort of linear
12 configuration. If you were to walk out there with your
13 six-year-old daughter and say, honey, where is the
14 channel? They'd say this is it, because I can see the
15 water here in the stream bed and those are the banks.
16 It's a pretty common sense sort of thing. That main low
17 flow channel, the main channel, the low flow channel --
18 and I'll use those terms -- that's what we're concerned
19 with here. It's within -- it may be within a larger
20 corridor or channel of some other kind, and that larger
21 channel may be either a floodplain or a flood -- result
22 of a flood, or it may be where the ordinary high-water
23 mark is, which is a term that's defined in the
24 navigability legislation.

25 Q. So you're making a distinction between the low

1 flow or main channel and the floodplain?

2 A. Yes. And I thank you for asking that
3 question, because I forgot to point out the picture.

4 So if we look here, the uplands or high area,
5 if you're walking along here, pretty much anybody with a
6 little bit of common sense can say I'm not in the river
7 down here. Walk down in elevation and you get across
8 some sort of valley or bottomland, and that may be the
9 floodplain, different source.

10 Then see this blue corridor down the middle.
11 That's the low flow channel. That's the boating
12 channel. That's the one we care about for navigability.

13 Q. And what --

14 A. And I don't care about the areas that are
15 outside the wet. We only put our boats on the water.

16 Q. What is the term "watercourse"? Is that
17 distinguishable from the floodplain, or how would you
18 define that?

19 A. A watercourse is a very inclusive term, and it
20 includes channels and floodplains or any other body of
21 water. And I don't find it instructive at all for
22 navigability. So I choose not to use that term
23 watercourse. I choose to use channel, low flow channel
24 or the main channel. Sometimes I'll say boating
25 channel.

1 So there's the low flow channel, but there's
2 also a flood channel. So we have big floods in Arizona.
3 A big flood comes through and it scours and removes
4 vegetation, leaves behind sand and gravel, bare sand and
5 gravel. That's the flood channel. It's where the flood
6 did its geologic work, where it removed vegetation,
7 created some sort of scar on the landscape in the
8 bottomland.

9 We don't care about the flood channel. Floods
10 are not part of the ordinary and natural condition. We
11 care about the main channel, the boatable channel. And
12 that exists within that flood channel. In Arizona, in
13 parts of the arid West we have something that's called a
14 compound channel. And this is where some of the
15 communication breaks down between parties. Folks will
16 describe the river as having certain characteristics,
17 and they're talking about the overall river corridor.
18 It's the geologists talking to each other and they're
19 concerned about floods and the impact of floods on the
20 landscape or the growth of riparian vegetation. So
21 they're talking about something that is broader than
22 what we're talking about.

23 A compound channel has this outside larger
24 feature, and inside that is this low flow channel.
25 Okay? Each of those, the big feature and the interior

1 feature have a different stream pattern. And this comes
2 up when we start talking about is the river braided or
3 is it meandering or something else.

4 And this is a picture of the same river in the
5 same location, one zoomed out looking at a big area; one
6 is zoomed in looking at a very discrete area. The area
7 on the left, you can say, well, that kind of looks
8 braided. There are multiple flow paths, right? Some of
9 those flow paths are dry. Most of those flow paths are
10 dry. Because during a flood, a flood might come down
11 there and create multiple channels. Some geologists
12 would look at that or some engineers would look at that
13 say, oh, yeah, the Gila River is a braided channel
14 because they're interested in this wide, the compound
15 part, the external part.

16 Other folks who are interested in habitat, for
17 instance, they're looking at the low flow channel -- and
18 I apologize that it's a little washed out right there.
19 It would be worth turning off the lights to get a
20 clearer view. Just the two down, down, and flip out the
21 rest. Drop the whole row. Top row. One more. I'm
22 afraid that didn't get much better, because these lights
23 didn't go off.

24 What we can see down the middle here, a single
25 channel that has a sinuous pattern. That's the place

1 where you would put a boat. That's the boating channel.
2 It is not braided. It is a single channel. So we've
3 got people talking past each other. I'm a boater. I'm
4 thinking about this thing on the right saying no, it's
5 not a braided channel. A geologist or a geomorphologist
6 who is interested in the overall river might be saying
7 oh, it's got a braided pattern here. So it depends on
8 what you're talking about, what pattern applies.

9 In fact, in Mr. Gookin's report, he points out
10 a publication by the Corps of Engineers. He says, "The
11 most common channel type in dry regions, compound
12 channels are characterized by a single, low-flow
13 meandering channel inserted into a wider braided channel
14 network." That's a perfect quotation, and that's
15 exactly what we see on the Gila River in many of the
16 regions outside of the bedrock canyons is this dual
17 compound channel. Interior single channel, exterior
18 flood channel. That's something else.

19 So what's the channel? It depends on the
20 objective, the intent of the speaker. Are we talking
21 about a navigable channel or are we talking about the
22 flood channel? Are we characterizing the river corridor
23 and its behavior over the long-term and its geology?
24 Are we talking about low flow conveyance? By doing a
25 flood impact study or a boating guide? That terminology

1 is easily confused because the geologist may say the
2 channel is, and he means something different than the
3 boating -- the navigability expert should be thinking
4 about.

5 Q. We will ask that the lights be turned back on
6 after a couple of additional slides.

7 A. You can turn them on right here, actually.

8 Q. And again, the photographs that show the two
9 Gila River pit photographs at Arlington, Arizona, show
10 the braided and nonbraided is slide 12 -- 10, excuse me.

11 A. A cross section, if I cut a slice through the
12 river and look at it in cross section -- what I'm
13 talking about is this is my low flow channel. It
14 exists. It's definable. It's where if you went out
15 there with your boat, where you would throw it in.
16 Something above that, that's going to be potentially dry
17 during ordinary low conditions, might be called the
18 active channel.

19 The flood channel is something bigger and
20 includes these features that are created during large
21 floods that are not part of the ordinary condition.

22 And another term that's often used is the
23 bottomland, which is basically the entire river valley.
24 The floor of the river valley. You can see this feature
25 illustrated on the Salt River here, and I've chosen the

1 Salt River because back around the time of statehood
2 there wasn't a lot of aerial photographs -- there not
3 being airplanes -- and you have this promontory here in
4 Tempe where you had a little bit of a viewpoint. And
5 what you see here is along the right side of the
6 bottomland, you see the water is over here. But you
7 also see that this is all scoured out and widened as the
8 result of a recent flood. That's a sandy bottom area
9 that may be within the ordinary high-water mark, but
10 it's not wet over here. It's wet over there.

11 Q. And again, if you hold a little steadier,
12 you're pointing to the area where all of those trees
13 are, and that's where the main channel or low flow
14 channel is?

15 A. These trees are along the right bank of the
16 river looking downstream. These trees here are along
17 the left bank. That shinier area right there is the
18 water.

19 You can see that out there in the future and
20 the further downstream, that same single channel pattern
21 exists within this wider, more braided flood network.

22 This becomes particularly important in the
23 reliance of work by Burkham in the 1970s where he
24 describes the river as being braided or this flood
25 pattern of the floods come down and widened out the

1 channel. The channel that he's talking about is not the
2 boating channel. The channel, and he defines the stream
3 channel. He has a specific paragraph where he defines
4 the stream channel, and he calls it the area devoid of
5 vegetation, the part of the bottomland or river bottom
6 that's devoid of vegetation.

7 If you were talking about the wet part of the
8 channel, it would make no sense to say it was devoid of
9 vegetation, because the river doesn't have vegetation in
10 it. Okay? So he's talking about something different
11 than what we're talking about. So the widening of the
12 river channel is not a widening of the wet part of the
13 river. That wet part of the river exists, as you can
14 see right there. There is Mr. Burkham's channel out
15 here. There is the boating channel over there. It's
16 just a portion of that.

17 Q. And just --

18 A. He describes the floodplain as the area
19 outside that channel devoid of vegetation that is
20 densely vegetated with vegetation.

21 Q. And just for the record, the first example
22 that you showed and used your laser pointer was slide
23 14, and you're now talking about slide 15.

24 A. That's correct. The same distinction between
25 this widening and braiding also applies to Huckleberry,

1 Gary Huckleberry's work, who did the geology sections of
2 the first Gila River report, the lower Gila River
3 report.

4 The existence of this lower flow main channel
5 in here gets to the kind of channel morphology geometry
6 that Hjalmarson has testified to previously, where he
7 talks about the relation of the width and the depth and
8 the flow, what the river forms for itself, that ordinary
9 channel. And I concur with his comments regarding the
10 existence and the geometry of that. It makes good
11 common sense and is consistent with the science known on
12 the Gila River.

13 So when it comes to braided and meandering,
14 there's also an intersection of this terminology in
15 describing the river pattern. On the left, this is a
16 braided river. On the right, is a meandering river.
17 And neither of those look like Arizona rivers. We have
18 something that's compound. You've seen this chart in
19 various reports and that is good technical work. I have
20 no objection to that chart itself. It's just in making
21 this description here, do we see what's in the Gila
22 River? We don't see any pictures where it looks like
23 that in its ordinary and natural condition, nor do we
24 see the degree of meandering that we see on the right.

25 Q. And that was slide number 17, correct?

1 A. 16. We're now on 17.

2 So is it meandering or is it braided? Well, a
3 geologist is going to answer yes to that. Navigability
4 expert should be answering no, it is not braided in most
5 places. There are places where the low flow channel may
6 split but dominantly is a single channel. And boating
7 occurs on that main channel.

8 What is the relevance to navigability of
9 channel pattern? Not much. Can you boat a braided
10 river? Sure, you can. There is nothing, no court
11 decision, no scientific document that says you cannot
12 boat a braided river. In fact, Dr. Schumm, when he was
13 still living, testified to this Commission to that
14 nature saying that yes, as long as it's deep enough, you
15 can boat a braided river. So the fact that it's braided
16 is not diagnostic of nonnavigability. The only thing
17 that's diagnostic of nonnavigability is if it is not
18 deep enough.

19 The real question is, is it deep and wide
20 enough to float boats? It's important to remember that
21 as we hear discussions about the channel
22 characteristics.

23 The streambed itself, according to the
24 navigability of legislation, the bed is the area lying
25 between the ordinary high-water marks. Because of the

1 peculiarity of Arizona rivers and this compound channel
2 that may or may not include -- that will include more
3 than, in some cases, the wet part of the channel. It
4 may be wider than this low flow channel.

5 I'm going to skip the definition of ordinary
6 high-water mark unless someone has any specific
7 questions on that. That's a physical characteristic of
8 the river valley.

9 You also heard a lot of terminology and lot of
10 discussion that the river may be erratic. That term is
11 not defined in the navigability statutes or anywhere
12 else in the Arizona Revised Statutes. So I turned to
13 Webster's Dictionary which tells me it's acting or
14 moving or changing in ways that are not expected or
15 usual. It's not consistent or regular.

16 Well, what's consistent or regular depends on
17 your perspective. If you're an irrigator and you're
18 trying to put water on your cotton, this particular time
19 of year, the fact that the spring snowmelt came early or
20 late may make a difference to you. If you're a boater
21 and you can boat it at low water and you can boat it at
22 ordinary high water, the fact whether that ordinary high
23 water came early or late makes no difference to you
24 whatsoever. So what the irrigator may describe as
25 erratic may mean nothing to the boater.

1 It also doesn't mean some ordinary seasonal
2 variation. So all of our rivers have ordinary high
3 water during seasons, either in monsoon or the spring,
4 but that's expected. That's predicted. We look at
5 Webster's Dictionary there, that's not unusual. Nor
6 does it mean the fact that there are floods. The fact
7 that there's a flood on the river, there's floods on all
8 rivers. I sat on the banks of the Ohio River watching a
9 whole bunch of barges wind up waiting for a flood to
10 pass for the better part of a week. It doesn't make the
11 Ohio River nonnavigable because it had a flood. Floods
12 are not part of the ordinary and natural condition of
13 the river. It just needs to be, according to the
14 Montana court, need not be susceptible at every point of
15 time during the year. But it can't be so brief that
16 it's not a commercial reality.

17 So as long as the river can be navigated in a
18 regular period does not fit the definition of erratic,
19 despite what a newspaper editor may describe the river
20 as.

21 Ordinary is simply the normal expected flow
22 range. We can look at that in terms of medians, any
23 other ways, medians, means. By definition, it's not
24 floods and it's not droughts. Now, there may be
25 seasonal variation. In fact, the definition of ordinary

1 high-water mark implies that there is ordinary high
2 water and there's ordinary low water.

3 Q. And that's different than flood or drought?

4 A. It's different than flood or drought. That's
5 a seasonal, an expected seasonal fluctuation.

6 Some rivers that have been found navigable
7 freeze over completely in the winter. Some of them dry
8 up in the summer. Freezing over is not our problem here
9 in Arizona. Some are low flow, can be, can be an issue
10 on some rivers in Arizona.

11 This chart depicts that ordinary expected
12 normal variation of flow. And I took the numbers off it
13 because I want to talk about the principles rather than
14 the numbers. I'll get back to the numbers specifically
15 for the Gila River.

16 But what we see here is the blue line. It
17 looks black on this plot right here, is the average
18 monthly flow. The average monthly flow as reported from
19 stream flow measurements. And you can see that there's
20 typically seasonal high flow during the winter months,
21 March, April, sometimes as late as May. We also get a
22 little bump in the flow during our monsoon season when
23 we have the thunderstorms. More runoff, rivers come up
24 a little bit. And that's fairly typical for all of the
25 rivers, particularly for the Gila everywhere in its

1 ordinary and natural condition.

2 We also see a seasonal low flow. Now, keep in
3 mind that these trends are a little bit altered by the
4 changes in the flow rates, and these are gage data. So
5 they don't account for -- this is not the pre-diversion,
6 pre-depleted condition of the river.

7 Q. And we don't have gage data or reliable gage
8 data for a pre-depletion or pre-irrigation conditions?

9 A. We have limited gage data for that condition,
10 and there's been a number of experts who produced
11 estimates of what those flow rates are, and I'll talk
12 about that in a bit.

13 Q. And when you talked about summer lows, does
14 irrigation make those lows lower than they would
15 ordinarily and naturally be?

16 A. It absolutely does.

17 Q. Please go ahead.

18 A. The pieces of information you see on this
19 chart are things called the flow duration. So 10
20 percent of the time the flow is below that level down
21 here. 50 percent or the median flow. Half the time
22 it's above that; half the time it's below that. And
23 this is also another important criteria. The 90 percent
24 flow duration, 90 percent of the time the flow is below
25 that rate.

1 Q. And we're looking at slide No. 22. It doesn't
2 have a number on the bottom, but I believe that that's
3 correct.

4 A. It does -- you're right. It's covered up by
5 the chart here. It is slide 22.

6 Another important fact here is that the
7 two-year flood levels are well outside of this. So even
8 small floods are well outside this normal range, which I
9 would define as being between the 10 and the 90 percent
10 flow duration. So the data I'm going to be giving you
11 is in this range right here. This is the normal
12 expectation. About 90 percent of the time it's going to
13 be between the 90 percent rate and the 10 percent rate,
14 and that the average seasonal fluctuation occurs within
15 that range. That's normal and expected. It's ordinary.

16 Another term we've seen a lot is describing
17 the river as unstable. Again, that's going to depend on
18 your perspective. Generally when we use unstable, we're
19 using that term in response to something that we've
20 built. So I built my house next to the river bank. The
21 river bank has always eroded since time began, but now
22 I'm next to it and so the river is unstable because it's
23 coming next to my house. It's the fact that I have some
24 intended human activity there that has interfered with
25 the river process. The fact that the river moves back

1 and forth may not reflect unstable. It reflects the
2 normal process of the river.

3 So unstable in Webster's Dictionary is likely
4 to change; it's not firm or fixed. And I will submit to
5 you that all rivers change with time. All natural
6 rivers change with time. They meander. They move their
7 sandbars around. They erode during floods. They scour.
8 They fill. That's what rivers do. They move water and
9 sediment and that changes with time. And that's
10 irrelevant to navigability. It doesn't matter to me as
11 a boater whether the river is here or it's ten feet to
12 the left or a thousand feet to the left as long as it's
13 deep enough to boat. If it's in a different position
14 when I come down next year, it doesn't matter to me at
15 all.

16 Q. You've already told us that floods, even a
17 two-year flood, let alone a hundred or five hundred year
18 flood, is not what would be considered an ordinary
19 condition of the river?

20 A. That's correct.

21 Q. And there are other reports by experts that
22 have been submitted that suggest that large floods blow
23 out or reshape the rivers. Does that mean that the
24 central channel or the main channel is getting wiped out
25 each and every time there is a large flood?

1 A. It depends on what you mean by wiped out.
2 Certainly the character of the river valley is
3 rewritten, but when it rewrites the character of the
4 river, it writes a low flow channel into that new story.
5 So the river may be blown out in the sense that the low
6 flow channel used to sit on the left side of the river,
7 and after the flood it may still be there. It may be in
8 the middle of the channel. It may be on the right side
9 of the channel, but it still exists and it still has
10 those characteristics of boating. Just like we saw in
11 the slide where I showed the Salt River in a post-flood
12 condition where there was still that ordinary main
13 channel, that boating channel that existed.

14 Q. And the altered condition, if the river were
15 left in its natural condition, that is, wasn't dammed or
16 diverted in a significant way, would that channel
17 recover as well as -- I mean both the flood and flow
18 channel recover and be restored to a natural condition?
19 Let me ask it a different way.

20 A. Please.

21 Q. If that channel does get blown out, as I
22 stated, would it normally recover if water were allowed
23 to perennially flow down that channel rather than the
24 channel being turned into desert?

25 A. Yes, it would.

1 Q. And would you explain that process?

2 A. Sure. So on the receiving limb of a flood, a
3 flood goes by, it has a peak where it's doing most of
4 its erosion. It may widen out a flood channel. As that
5 flood recedes, it starts to form a low flow channel,
6 either where it used to be or in a new place. And if
7 flow is not diverted from the river, those low flow
8 channels will persist and create a channel of a specific
9 general geometry within that corridor of the river.

10 Q. And native vegetation, such as cottonwoods and
11 willows, which you'll discuss as having been present
12 along a large portion of the Gila River historically,
13 would be able to recover and help prevent future
14 erosion?

15 A. Yes. Yes. So that the advent of human
16 impacts on the river slow the rate of recovery because
17 it's taken away the low flow channel; it's taken away
18 the low flow discharge and makes the river respond more
19 slowly in recovering a natural geometry.

20 Q. Thank you.

21 A. So, describing a river as unstable may reflect
22 my desire. So from an irrigator's standpoint who wants
23 the water to be in one place where he can get at it with
24 his diversion dam, the fact that it moved away from his
25 diversion dam, he says, ah, the river is unstable. From

1 a boaters's perspective, it doesn't matter whether he's
2 near one bank or the other. He would not describe it as
3 unstable.

4 Natural is simply without human impact. We
5 talked about that earlier today. I won't beat on it
6 anymore. It's basically without the damming, without
7 the diversion.

8 Q. And just to interrupt you, because we had a
9 brief discussion of this I believe previously, but you
10 mentioned Huckleberry earlier. Does he state in his
11 earlier presentation that low flow after damming will
12 slow or prevent regrowth of native vegetation? Is that
13 something that he discussed, if you recall?

14 A. I believe that he did. And it's important to
15 recognize in looking at Gary Huckleberry's work, like
16 our earlier reports, we were not directly focused on
17 determining ordinary and natural conditions. A lot of
18 what Dr. Huckleberry wrote about was for the statehood
19 conditions, not the ordinary and natural conditions.

20 Q. Please proceed. And I believe we're on slide
21 24?

22 A. 25 now. And so for the Gila River in
23 determining ordinary and natural condition, what we're
24 trying to do is identify the major changes to the river
25 system, basically add back in the flow that's been lost,

1 and to identify a natural cross section. And when we do
2 that, it indicates that the river was susceptible for
3 navigation. And that's something we'll get to this
4 afternoon.

5 In doing that, I want to underscore the
6 relevance of the hydrologic data that we're providing
7 and presenting. Our reports, the Land Department's
8 reports relied on gage data. That gage data is
9 predominantly in conditions that were after the ordinary
10 and natural condition of the river was altered.
11 Primarily flow was being diverted out of the rivers. So
12 the flow data that we're using underestimates the
13 ordinary and natural flow rates of the river. So we're
14 using lower discharges than would apply for the ordinary
15 and natural condition. Pre-statehood were higher.
16 Therefore, the streams would have been more navigable
17 than they would be based on the flow data that we're
18 using. So we're taking a conservative approach from a
19 nonnavigability standpoint. Those were the data that we
20 had available.

21 Other folks that you're going to hear from
22 presumably this week are going to describe the flow
23 estimates that they made for the ordinary and natural
24 condition that pre-date the diversions and storage and
25 use of water that kept it out of the rivers.

1 But from our perspective, since I feel I can
2 demonstrate susceptibility to navigation and accounts of
3 navigability in the depleted condition, to have even
4 more flow on the river only makes it more navigable.

5 Furthermore, by restoring those flow rates
6 does not change, significantly change the velocities or
7 introduce any other hazards that would make it less
8 navigable.

9 And now finally I can start on the actual data
10 for the Gila River. We're at ten to 12:00.

11 Q. We will be picking up at slide number 27?

12 A. This is slide 27.

13 CHAIRMAN NOBLE: Is it a good time to take a
14 break?

15 THE WITNESS: There you go. I knew if I
16 paused long enough.

17 CHAIRMAN NOBLE: Let's come back, let's make
18 it 1:00. Will that work for everybody, or do we need a
19 little bit more time than that? Okay. We'll get back
20 together at 1:00.

21 (Recessed from 11:47 a.m. to 1:00 p.m.)

22 CHAIRMAN NOBLE: Let's put this hearing back
23 in order and away we go.

24 BY MR. KATZ:

25 Q. We are ready and I think we are picking up

1 with slide number 27 from the Gila River PowerPoint.

2 A. All set to go? All right.

3 Let's dive into the navigability of the Gila
4 River. And again, our study reach goes from the New
5 Mexico border down the confluence of the Colorado River.
6 Just by way of preview, if you haven't guessed already,
7 its stated position is that the Gila River was navigable
8 in its ordinary and natural condition. That it has a
9 history of navigation. Still used for some kinds of
10 navigation. It is and was susceptible to navigation and
11 was more susceptible to navigation before it was dammed,
12 diverted, and altered. That's what you're going to hear
13 about.

14 The study reach, as I mentioned, crosses the
15 state from east to west. This blue line there, starting
16 from the New Mexico border, joining the Salt, joining
17 the Colorado River.

18 Q. And that's slide 29, and we also have that
19 blown up and mounted behind you, correct? And that we
20 will leave with the Commission, unless they don't want
21 us to.

22 A. As the Gila River crosses this entire expanse
23 of Arizona, it's as diverse as the State of Arizona
24 itself. So it crosses through broad alluvial valleys
25 and narrow bedrock canyons. And for that reason the

1 state believes that it's important to segment the river
2 and consider it in its -- each of its characteristics by
3 segment. We base that segmentation on its changes in
4 geology between broader alluvial valleys -- alluvium is
5 material that's transferred by the river -- and
6 intervening bedrock canyons as well as the changes --
7 consequence -- consequent changes in the channel
8 characteristics, patterns of width and depth variation,
9 and most importantly the changes in hydrology as we move
10 along the river. We believe those are justification for
11 considering the river in segments.

12 Q. In the prior reports where you've dealt with
13 reaches, those were basically defined more by geography
14 rather than geology, geomorphology over water flow,
15 correct?

16 A. Yes. You'll notice that there are some
17 similarities between the reaches that were in previous
18 reports -- it's really the upper Gila -- and then the
19 rest was dictated either by the Commission itself that
20 says this is the segment we're interested in looking at
21 right now, and those are geographical.

22 MS. HERNBRODE: Jon, could you project a
23 little bit more?

24 THE WITNESS: Sure. I was asked to speak
25 louder. I think my mother has told me since I was this

1 big.

2 VICE CHAIRMAN HENNESS: Why didn't you listen?

3 THE WITNESS: Something my mother has also
4 asked, on many other fronts as well.

5 BY MR. KATZ:

6 So we were looking at the segmentation based
7 on the navigability characteristics, susceptibility,
8 physical characteristics, flow rate, tributaries coming
9 in, and as Paul just pointed out, the reaches in the
10 previous reports were more geographical.

11 I'm going to give you a brief overview of the
12 eight segments that we divided the river into. And then
13 I will present information by topic and relate it to
14 each of these reaches.

15 So keep in your mind these different segments.
16 I'll speak to them by number. So do your best to
17 remember. Segment 1 goes from the New Mexico line down
18 to the beginning of the Gila Box. The beginning of the
19 Gila Box is geology. It's not politics. So there's no
20 fine line where the Box starts all of a sudden. We made
21 the division at the Old Safford Bridge. You could make
22 an argument for it being a little further upstream.
23 Really, that's -- the boundary is gradual. It's
24 irrelevant, but there is a definite difference between
25 the character of the river in the Duncan/Verde Valley as

1 opposed to in the Box itself.

2 So Segment 1 is the Duncan Valley. Basic
3 characteristics, it's a perennial stream there. It
4 remains so. It has this compound river channel that we
5 talked about before. Little bit of riffles or very
6 small rapids, if you will. It's got a sand and gravel
7 bed to it. The channel, the main boating channel is
8 sinuous to straight, and it occurs in a very broad
9 bottomland valley. There are no rapids or obstructions,
10 natural obstructions in Segment 1. There are also no
11 major tributaries that join in that area.

12 VICE CHAIRMAN HENNESS: Excuse me, Jon. San
13 Francisco comes in where?

14 THE WITNESS: San Francisco comes in, then the
15 Gila Box.

16 VICE CHAIRMAN HENNESS: So it comes in there?

17 THE WITNESS: Yes.

18 VICE CHAIRMAN HENNESS: There is a tributary
19 there?

20 THE WITNESS: In Segment 2.

21 VICE CHAIRMAN HENNESS: Okay.

22 BY MR. KATZ:

23 A. We're upstream of the Box. The question was,
24 the San Francisco, where does it come in. Same thing
25 with Eagle Creek, Bonita Creek.

1 It occurs to me that there may be a number of
2 folks who have never seen the Gila River and have no
3 idea what it looks like. So we prepared some flyovers
4 that were made from Google Earth. So we're using aerial
5 photography. And we will see how well this works here.
6 The projector worked well at home. It takes just a
7 minute to load. And what you're seeing is Google Earth
8 images of the river taken from about a thousand meters
9 looking down at the river so you have a chance to see
10 it. As I say, it takes a moment to load. We have these
11 for each of the rivers.

12 Q. And when you're showing this, does the
13 presentation show the river at statehood or in modern
14 times?

15 A. Obviously, in modern times, but they're aerial
16 photographs, and statehood pre-dates airplanes.

17 Q. I know that we all knew that, but --

18 A. Yes.

19 Q. At least I hope so. Although, the earth is
20 still flat.

21 MR. HELM: How old are you?

22 MR. KATZ: 17.

23 BY MR. KATZ:

24 Q. But beside that though, Jon, the reason I
25 asked you that is that we are still dealing with flows

1 in the river that would be within at least the low flow
2 rates of ordinary and natural?

3 A. These are well below the median flow rates for
4 pre-development conditions.

5 I'm sorry, I'm having a little technical
6 support here. This is my son Sam, my youngest. He
7 postdates original navigability hearings.

8 VICE CHAIRMAN HENNESSY: That's all right, I'd
9 use a grandson, too.

10 BY MR. KATZ:

11 Q. And this is Gila River Segment 1 with a flow
12 of about 136 CFS?

13 A. Right. And that's what you'll see in print up
14 here is the flow rate on the date of the aerial
15 photograph. Google Earth, if you've used that media
16 before, doesn't always have the same date of aerial
17 photograph available. So where we change dates we might
18 note a date in the flow rate changes as well.

19 COMMISSIONER HORTON: That's Christmas Day.

20 THE WITNESS: There you go. My gift to you.

21 BY MR. KATZ:

22 A. So again, this is post-disturbed condition.
23 This is starting right at the New Mexico boundary, and
24 it flows along right here, and I'll stop it from time to
25 time, or give a holler if you want to stop and look at

1 something. You see the low flow channel is wet. It's
2 much wider than a small boat. You can also see the
3 degree of development. You can also see that compound
4 channel that I was talking about earlier. Inside that
5 is the low flow wet channel. I'll just stop for a
6 second here. You can see there is the wet part. That
7 color is the water. This is the sandbed from a recent
8 flood. Now we're getting into the town of Duncan
9 itself. That's the Church Street Bridge, if you've ever
10 been through there crossing over. Nice, dense riparian
11 vegetation there.

12 Move on downstream and I'll let it run. You
13 can see most of the floodplain. The bottomland is
14 developed for agriculture. Occasionally that low flow
15 channel will split into a double channel, for the most
16 part in a natural condition. So even -- now we're at 78
17 CFS. Changed the date to September.

18 Q. And that's significantly below historical
19 median flow?

20 A. It is. But it is a wet river. You can
21 compare the width of the railroad on the left and the
22 width of the channel to get kind of a sense of how wide
23 the channel is. The fact that it's continuous.

24 VICE CHAIRMAN HENNESSY: Jon, help me a little
25 bit with the body of water. 78 CFS won't make it to

1 Coolidge, will it?

2 THE WITNESS: It won't now because it all goes
3 into the dam ahead of Safford Valley, but 78 CFS absent
4 man's impacts, yeah.

5 VICE CHAIRMAN HENNESS: It will go?

6 THE WITNESS: Yeah. Now, with diversions and
7 whatnot, we'll drink this. You get ahead of Safford
8 Valley and it will take almost all -- it has the
9 capacity to take a lot more than that. So what gets
10 past that dam, of course, is a function of water rights,
11 who's supposed to get stuff downstream.

12 VICE CHAIRMAN HENNESS: You're not talking
13 about Coolidge?

14 THE WITNESS: I'm talking about -- oh, getting
15 past Coolidge?

16 VICE CHAIRMAN HENNESS: My question was would
17 78 CFS make it to Coolidge?

18 THE WITNESS: Make it to Coolidge Dam?

19 VICE CHAIRMAN HENNESS: Coolidge Dam.

20 THE WITNESS: Yes.

21 VICE CHAIRMAN HENNESS: You're not talking
22 about an intermediate dam, are you?

23 THE WITNESS: Well, there is a diversion dam
24 ahead of Safford Valley.

25 VICE CHAIRMAN HENNESS: Oh, yeah, a conversion

1 dam.

2 THE WITNESS: Good question, yeah. So that's
3 what takes up the water in the normal course.

4 VICE CHAIRMAN HENNESS: That and a few pumps
5 in the river bottom.

6 THE WITNESS: Yeah, fair share of wells. I'm
7 sure you're well aware.

8 BY MR. KATZ:

9 Q. My objective here is just to give everybody a
10 common frame of reference if they have never seen the
11 river before. This is a pretty good representation of
12 what it looks like during what are now very low flow
13 conditions. And later in our presentation we'll talk
14 about what the pre-development, the pre-diversion flow
15 rates were. And keep in mind the 78 CFS versus what
16 those flow rates are when we get to that. One main
17 tributary comes in. There's some other communities
18 along this area. Apache Grove, York.

19 VICE CHAIRMAN HENNESS: Virden.

20 THE WITNESS: Virden is upstream. You're
21 going to come down to the 191 Bridge in a moment here,
22 get around the bend by Three Way and Guthrie.

23 VICE CHAIRMAN HENNESS: This was in 2010?

24 THE WITNESS: This is 2010.

25 COMMISSIONER ALLEN: Jon, what is the

1 approximate depth at this point?

2 THE WITNESS: 78 CFS. It's averaging, I would
3 say, around a foot.

4 COMMISSIONER ALLEN: Okay.

5 THE WITNESS: And I'll get into a little more
6 detail, and I'll show you some rating curves with some
7 depths, specific flow rates. There's the 191 Bridge,
8 and stop it there. I'll come back to that at a later
9 time.

10 Back to our presentation.

11 BY MR. KATZ:

12 Q. Now, let me just ask you, both December and
13 September that we just saw, September of 2010, December
14 2006, those aren't in the normal rainy season or
15 snowmelt seasons, correct?

16 A. Correct. Yes. September could be the tail
17 end of the monsoon season. But the flow rates are
18 certainly not elevated above median flow rates.

19 Q. And in July and August they would normally be
20 higher in ordinary weather conditions or in the spring?

21 A. The average conditions in July-August would be
22 higher than say June. Typically the highest flow rates
23 on average seasonally are going to be in March, April,
24 May on the Gila, on the upper Gila.

25 Segment 2 goes from the downstream end of

1 Segment 1, obviously through the Gila Box. The Gila Box
2 is the National Riparian Conservation Area. It's very
3 scenic. It's a bedrock canyon. A beautiful, wonderful
4 place managed by the Bureau of Land Management.

5 The San Francisco River is one of the major
6 tributaries that joins in there, and in low flow
7 conditions about doubles the flow of the river at that
8 point at low flow. It is perennial through there. The
9 channel is sinuous. It's a pool and riffle sequence so
10 you have slow-moving water in pools, short riffles, a
11 little rockier. The bed tends to be sandy and gravelly
12 until you get to the San Francisco, and then it starts
13 to become a little more cobbly downstream of that so the
14 riffles are a little rockier. The channel is sinuous to
15 straight, and again you have bedrock canyon on both
16 sides which limits the adjustments of the channel in
17 response to floods and whatnot, but again, floods not
18 being a part of the ordinary and natural condition.

19 There are some rapids in Segment 2, some small
20 Class IIs. And again, as we mentioned, a Class II is a
21 novice level rapid to negotiate.

22 Q. Before you go on, when you list the major
23 tributaries, the San Francisco River, Eagle Creek,
24 Bonita Creek, have those tributaries been significantly
25 diverted since the 1870s or statehood?

1 A. Yes, they have.

2 Q. And do they contribute today the same levels
3 of water that they would in their ordinary and natural
4 conditions?

5 A. No, they do not.

6 Q. And through this segment, are there irrigation
7 diversions or damming?

8 A. There are no major irrigation diversions
9 within Segment 2.

10 Q. But their tributaries are, in fact,
11 significantly diverted --

12 A. Yes.

13 Q. -- or at least some of them?

14 A. Correct.

15 VICE CHAIRMAN HENNESS: To what, Jon?

16 THE WITNESS: Pardon me?

17 VICE CHAIRMAN HENNESS: When you say diverted.

18 THE WITNESS: Agricultural and municipal uses
19 on the San Francisco, and also Eagle Creek, I believe,
20 has a water right that goes to --

21 VICE CHAIRMAN HENNESS: To the mine?

22 THE WITNESS: To the mines.

23 VICE CHAIRMAN HENNESS: Okay.

24 THE WITNESS: Segment 2, I'll go back to our
25 flyover here. Take a look at the Box. The canyon is

1 much more tortuous. So I apologize if anybody gets a
2 little nauseous flying down this segment here. Now
3 we're down to 57 CFS -- this is from April 2013 -- just
4 downstream of 191 Bridge. This is the community of
5 Guthrie right here, such as it is.

6 Human impacts to this reach are obviously
7 some -- there's a railroad that runs parallel to
8 portions of it. There's a railroad bridge. There's a
9 lot of it that's essentially untouched. There's some
10 private inholdings that have some fences. It's one of
11 the more popular recreationally boated areas. Most of
12 that boating occurs in the spring, but it's boatable
13 year-round.

14 One disadvantage of an overview at this
15 elevation is you don't get quite the sense of the
16 verticality of the canyon walls. There's the Old
17 Safford Bridge right there. You don't get a sense of
18 the spectacular scenery, but you do get a sense of the
19 width of the river. Again, plenty of space there for
20 low draft boats. Big horseshoe bend here.

21 BY MR. KATZ:

22 Q. And is flow rate of 57 CFS below what would be
23 the median flow rate in ordinary and natural condition?

24 A. Yes, it is. Significantly below.

25 Q. And it's still boatable?

1 A. Yes, it is.

2 Here's the San Francisco River coming in.

3 VICE CHAIRMAN HENNESS: Are we going upstream
4 or downstream?

5 THE WITNESS: You're going downstream. We're
6 heading west, more or less.

7 A few twists and turns. There's the county
8 line right there. That's not a road or anything, that
9 white line we just crossed. Moving from Greenlee to
10 Graham. And again, continuously wide channel. They for
11 some reason named this area right here Camelback Lake --
12 Camel's Back Lake. It's just a long pool. There's no
13 real lakes in the river bottom.

14 The Class II rapid is right there. We just
15 passed it. It's something that the locals call Punk
16 Rock. It's a big rock that sits in the middle of the
17 river and you need to go around it.

18 Predominantly a single channel. Every once in
19 a while there's a braid that splits.

20 VICE CHAIRMAN HENNESS: That's April 22?

21 THE WITNESS: Yes.

22 VICE CHAIRMAN HENNESS: Spring runoff at 57
23 CFS?

24 THE WITNESS: This particular spring in April,
25 there wasn't a lot of runoff.

1 VICE CHAIRMAN HENNESSY: Must not have been any
2 runoff.

3 THE WITNESS: No, the Gila highlands have had
4 a number of years of drought in a row now, and there
5 hasn't been much high flow on the Gila.

6 Now we're getting down towards the end of the
7 riparian refuge. You can see the road there. That's
8 the end of that segment. Stop it here. We're going to
9 get down in just a second to the dam.

10 BY MR. KATZ:

11 Q. But you're now showing -- you were showing 130
12 CFS at or about the same time frame?

13 A. I said 30 CFS.

14 Q. 130.

15 A. 130 CFS, yes. So it's variable, and again,
16 it's a depleted flow.

17 Segment 3 --

18 Q. And before you get there, just for our record,
19 the map of Segment 1 was slide 32. And slide 35 was of
20 Segment 2, and Segment 3 is on page -- or slide 38, and
21 we do have enlargements of these maps available for
22 illustration and the benefit of the Commission.

23 A. Correct. And they're behind me here. When we
24 actually talk about the reaches specifically, I'll pull
25 them out and point at specific features here.

1 Segment 3 runs from the downstream end of the
2 Gila Box down to the San Carlos Reservoir, the boundary
3 being at Coolidge Dam where it enters the canyon, the
4 case where the geography and geology overlie each other
5 pretty nicely. This was a perennial reach. Looked a
6 lot like the reach up near Duncan. A little more flow
7 because of the larger tributaries that came in during
8 the Box. It had this compound channel pattern, a pool
9 and riffle and a sand and gravel bed, sinuous main
10 channel within the broad alluvial valley. There were
11 and are no rapids in this section. It's all flowing
12 over a sand and gravel bed.

13 The major tributary in this reach is the San
14 Carlos River which, as I recall, is an intermittent
15 stream, a near perennial but subject to very low flow
16 during the early summer months.

17 Q. And was that prior to diversion?

18 A. Was what?

19 Q. In other words, you talked about the San
20 Carlos being near perennial flow, but it had dry
21 portions of the year where it was dry or near dry. Was
22 that in its natural condition or was that the result of
23 agricultural diversion?

24 A. I don't -- I'm going to just defer on that.
25 We did the navigability study for the San Carlos River

1 more than ten years ago, and I don't recall the answer
2 to that.

3 Q. But it no longer today contributes what it
4 once did because there are significant diversions as we
5 sit here today?

6 A. Well, there's certainly pumping along the way
7 there, but my impression from a recollection from years
8 ago was that that river was never a major contributor in
9 terms of the normal ordinary flow. The main source of
10 flow was the Gila itself.

11 Segment 3 I'm going to show you, but it's
12 highly disturbed. So we're going to ramp-up the pace
13 here a little bit once we get past the head of Safford
14 Valley Dam. Now we're at 130 CFS, according to the
15 gage.

16 Q. And I think that that's where I picked up the
17 130 CFS is where you stopped the last presentation.

18 A. Yeah. So we're reporting gage data that was
19 either at the -- there's the dam going past it right
20 there. You can see it diverting off. In this case a
21 little bit of flow is passing, which is kind of an
22 interesting phenomenon. There may be downstream
23 diversions that it's delivering to. I don't know the
24 mechanics of it. I've been there at this time of year
25 and seen that exact phenomenon, and there are also

1 rivers where it reaches within this segment where those
2 diversions take all of the flow, and then a mile or two
3 downstream you have flow again in the river. I think
4 it's irrigation returns. But again, it's very
5 disturbed.

6 I want to just show you this part, as you see
7 the change in the character of the river here from what
8 it was to what it has become. It has lost a lot of the
9 riparian habitat because of the depletion of the water,
10 and it's just a very different looking river.

11 I'm going to speed it up at this point,
12 because this is a very long segment and there's not a
13 lot to see.

14 VICE CHAIRMAN HENNESS: Is the 130 CFS
15 measured at Kelvin?

16 THE WITNESS: That is measured at the head of
17 Safford Valley.

18 VICE CHAIRMAN HENNESS: Safford Valley.

19 THE WITNESS: Yes.

20 VICE CHAIRMAN HENNESS: Do you know what it is
21 at Kelvin?

22 THE WITNESS: On this particular date I don't.
23 And it might bear no relation to what's flowing ahead of
24 Safford Valley, because the flow at Kelvin is governed
25 by the releases from Coolidge Dam. So it could be, it

1 could be 2,000 ahead of Safford Valley and 15 at Kelvin,
2 and it could be the exact opposite of that.

3 So I'm just going to jump ahead here for the
4 sake of brevity. Commissioner Hennes asked me to speed
5 up.

6 As we get closer to San Carlos Reservoir you
7 can see the influence of the invasive plants and
8 Tamarisk and its impact on the river. Again, despite
9 all that, you see down the center of the corridor there
10 is, there is a defined channel. And I've seen that in
11 person doing fieldwork out there. As you push your way
12 through the tamarisk, eventually you find a little wet
13 part of the channel that still exists despite all these
14 major diversions.

15 Q. And is tamarisk a natural vegetation along
16 this section of the Gila River?

17 A. It's natural, but it's not natural for
18 Arizona.

19 COMMISSIONER HORTON: It's an invasive --

20 THE WITNESS: Exactly. Quite troublesome. It
21 uses a lot of water.

22 Now we're in the back water area of San Carlos
23 Reservoir and it's highly disturbed. We're going to
24 move on and back it up right here.

25 And this is a reservoir without much water on

1 this particular date. And there we see the dam, and
2 that's the end of Segment 3.

3 Segment 4 is the canyon downstream of Coolidge
4 Dam. It's called -- it includes the Eye, Needle's Eye
5 Wilderness. Another beautiful canyon area. In some
6 respects similar to the Gila Box. A little less boated
7 because the access is somewhat controlled. There are a
8 number of Class II rapids within there. I'll get to
9 that a little bit later.

10 There's one that's potentially a Class III,
11 and that one is the one I showed you earlier with myself
12 and my future daughter-in-law in the front of my canoe
13 paddling through there.

14 It ends about at the State Route 77 above
15 Winkelman. It is a perennial reach and has a sinuous
16 channel pattern, pool/ripple sequence again. More
17 cobble, more rocky, in a bedrock canyon. There are a
18 number of smaller rapids, number IIs, a couple of IIs,
19 and one that's potentially a III, as I mentioned.

20 There are no major tributaries that come in
21 that reach. And again, we have a flyover of this reach
22 to give you an idea of what it looks like today. Then
23 we'll make some comparisons to what it might have looked
24 like in the past. It's an interesting dam, if you ever
25 have a chance to go out and take a look at it.

1 For some reason you're stalled. There you go.

2 BY MR. KATZ:

3 Q. This is below Coolidge Dam, correct?

4 A. It is below Coolidge Dam. We are going to
5 change dates here. We're in 2011. In November, the
6 flow rate is 81 CFS. You know it's November because you
7 can see the trees along the bank have turned color.
8 Little bit of fall color there. Again, beautiful
9 canyon. Continuous flow. This is well below the
10 pre-development, pre-diversion flow rate. Nice sharp
11 bend there.

12 VICE CHAIRMAN HENNESS: This is November?

13 THE WITNESS: November 22nd, 81 CFS. And that
14 would be from the gage below the dam.

15 VICE CHAIRMAN HENNESS: So then that's been
16 released or an inflow.

17 THE WITNESS: That's a release.

18 BY MR. KATZ:

19 A. It's not changing geology there so much as a
20 change in photographs. You see the color change.

21 Now we're in February of 2013. 99 CFS. You
22 can see the river gets quite tight. We're going through
23 the Needle's Eye. You now know why it's named that.
24 When the early explorers came down this canyon looking
25 for a route, for a road or a railroad or a canal and

1 concluded that it was just too tight and tortuous for a
2 road, and they called it an impassable canyon. They're
3 not referring to its characteristics as for boating.
4 They were referring to its characteristics for building
5 a road, a railroad, and they were correct. Not a great
6 place for a road.

7 You can see the river, continuous channel down
8 at the bottom even at 99 CFS. And we've submitted a DVD
9 that has all of these flyovers on it so that you can
10 look at them at your leisure. When you run it on your
11 computer screen, it will be a little crisper than it
12 comes through the overhead projector here.

13 VICE CHAIRMAN HENNESS: Where is the road,
14 Jon?

15 THE WITNESS: Not yet. It's coming up soon.
16 It's 77, comes around the bend, a couple of bends here.
17 We're still well above Winkelman here. It's about 28
18 miles from the dam down to Winkelman.

19 In the distance you're starting to see some of
20 the mining activity up there in the hills. So now we
21 know we're getting close.

22 VICE CHAIRMAN HENNESS: Must be Christmas.

23 THE WITNESS: There's a road into Christmas
24 and that's a reach that people recreationally boat. If
25 they can't get access to the upper part of this reach,

1 the segment, they'll come in at Christmas and paddle on
2 down to Winkelman. Big hairpin bend. There's 77 right
3 there. Turn and run parallel to the road for a fair
4 distance here. We have a lot more to see. I'm going to
5 skip ahead a little bit and stop it just there.

6 BY MR. KATZ:

7 Q. And let me just ask you, this, as you said a
8 moment ago, was below Coolidge Dam. What effects does
9 the dam have on what would be the natural flow of this
10 river seasonally?

11 A. Actually, it flip-flops the seasonal trend.
12 Rather than having a higher winter flow, it tends to
13 bring the winter flows down lower.

14 Q. That's because you're storing the water in the
15 reservoir?

16 A. Storing it up for the irrigation season. And
17 then during the summer they release it. Basically, the
18 section downstream of the dam operates more like a
19 canal, delivering water to downstream users. And so
20 it's -- depending on the water supply for that year,
21 it's either -- it's higher than it would have been
22 absent the releases. Let's put it that way.

23 Q. And even though it's higher than it would have
24 been absent those releases, as the water flows down to
25 the end of the segment, it is being diverted for

1 purposes of agriculture or mining, correct?

2 A. When it gets down to the downstream end,
3 that's where the diversions are taken at the end of
4 Segment 5.

5 Q. So those don't have as much of an impact from
6 Coolidge Dam until that location as they do below the
7 area you just described?

8 A. Yes. The other impact I would say in that
9 reach is because of the absence of floods or the
10 mitigation of lowering of floods is the channel tends
11 not to get cleaned out. It tends to have a little more
12 strainers than it would otherwise. So you don't have
13 the big flows that are knocking a lot of those strainer
14 things out of the way.

15 Q. And sediment, is that also building up, or is
16 that on the upstream side of the dam?

17 A. Yeah, downstream of the dam there would be
18 typically sediment depths that the reservoir is going to
19 store sediment and release cleaner water. So it tends
20 to make the channel rockier than it otherwise would --
21 without those sands it's a little tougher to boat.

22 Q. But is it your opinion that even at these
23 significantly lower than normal flows, the river along
24 Segment 4 is boatable in its entirety?

25 A. Yes.

1 Q. And perennially?

2 A. Yes.

3 Q. Thank you.

4 A. Segment 5 runs from about where 77 and the
5 river meet up. Down through Winkelman, around the bend
6 to Kelvin and Riverside, and then through the low hills
7 down to the Ashurst-Hayden Dam. And we changed the --
8 we ended the segment there for a couple of reasons. One
9 was we break out at the last of the larger canyons, and
10 we enter a losing reach of the stream. So the stream
11 starts to lose water to the ground as we move downstream
12 of Segment 5.

13 VICE CHAIRMAN HENNESS: Segment 5 ends at the
14 Ashurst-Hayden?

15 THE WITNESS: That's correct. That seemed
16 like a convenient dividing point in its ordinary and
17 natural condition. Boundary would probably be just a
18 hair upstream than that but it seemed close enough.

19 VICE CHAIRMAN HENNESS: My dad was born in
20 Kelvin, October of 1900.

21 THE WITNESS: Interesting place. Yeah, I
22 think you'll see some of the accounts of some Henness
23 folks that are doing things on the river along the Gila.
24 I wondered if that was a relation.

25 Segment 5, again, that's the reaches. It was

1 perennial, pretty close to perennial, depending on how
2 its operated. It's got that compound channel pattern to
3 some degree. Pool and riffle, sand and gravel, some
4 cobbles. Has a straight to sinuous channel. Down to
5 Riverside it's essentially an alluvial valley with
6 shallow bedrock a little bit downstream. I suppose if
7 you're a real nitpicker, you could divide this segment
8 into four segments itself, but I'm more of a lumper than
9 a splitter and decided to keep this segment the same.

10 There's only one Class II rapid. No Class III
11 rapids or IVs or Vs. There's a number of smaller Class
12 Is throughout here. It has one major tributary, San
13 Pedro River, which contributes some flow, but it's a
14 smaller percentage than the flow coming down the Gila
15 itself.

16 VICE CHAIRMAN HENNESS: Does Mineral Creek get
17 any water in there?

18 THE WITNESS: I'm sorry?

19 VICE CHAIRMAN HENNESS: Does Mineral Creek get
20 any water in there?

21 THE WITNESS: There is a Mineral Creek that
22 comes in, but it's bringing in a small amount of flow.
23 Mineral Creek is like one of those names in Arizona
24 that -- Mineral Creek, Rattlesnake Gullets and
25 Cottonwood Wash, there's a lot of them.

1 Segment 5, flyover here. You can see the
2 change. We're out of the canyon at this point. 130
3 CFS. We're going to move relatively quickly through
4 there. There's the bridge at Winkelman. Second bridge.
5 There's the San Pedro. Don't blink. Diversion dam.
6 Fish control, whatever that thing is. And it flows down
7 this valley here, and we see a lot of this. You can see
8 the increase of the tamarisk, it's this channel. It's
9 sinuous through here. I'm going to skip ahead a little
10 bit because it's a lot of the same thing.

11 As we move past the mining debris and whatnot.
12 More of the same, single channel in amidst the tamarisk.
13 And again, there's a railroad that runs along part of
14 it. Private crossing there. Rickety old bridge.

15 VICE CHAIRMAN HENNESS: Where is the bridge?

16 THE WITNESS: The Kelvin Bridge?

17 VICE CHAIRMAN HENNESS: The Kelvin.

18 THE WITNESS: It's coming up. Again, single
19 channel.

20 VICE CHAIRMAN HENNESS: It's not a rickety
21 bridge. It's a good bridge.

22 THE WITNESS: Kelvin Bridge is a good bridge.
23 The one upstream I'm saying is a bridge that you can
24 bounce by standing on it -- not the Kelvin Bridge.

25 VICE CHAIRMAN HENNESS: You're too heavy.

1 THE WITNESS: I've been told that before, too.

2 VICE CHAIRMAN HENNESS: Still going west,
3 right?

4 THE WITNESS: Yep. Actually, we're going
5 northwest here at this point. You're going downstream.

6 VICE CHAIRMAN HENNESS: What is the white
7 line, railroad?

8 THE WITNESS: That's roads. This side over
9 here, that's probably a railroad. This right here is an
10 old dirt road.

11 VICE CHAIRMAN HENNESS: That's the old Kelvin
12 Road.

13 THE WITNESS: That right there is
14 Ashurst-Hayden. Slipped through that canyon, not much
15 notice.

16 BY MR. KATZ:

17 Q. Let me just ask you. You mentioned early on
18 in that flyover that this is a segment of the river that
19 is losing water. What is the source of that water loss?

20 A. It's actually the next segment is the losing.
21 This particular reach we just discussed, Segment 5, is
22 the gaining reach.

23 Q. Okay.

24 A. So there's springs that bring in flow in its
25 ordinary and natural condition. The flow would

1 generally increase as you go in the downstream
2 direction.

3 Q. Okay.

4 A. The next segment down is, in fact, is a good
5 segue to this slide right here. A losing stream, and it
6 loses water to its bed, infiltrates into the ground,
7 evaporates, loss due to vegetation.

8 Q. Going back though to Segment 5, that 130 CFS,
9 would that be a median flow rate under natural and
10 ordinary conditions?

11 A. Yeah. Again, we're below the long-term
12 ordinary and natural flow.

13 Q. But at 130 CFS, would this segment of the
14 river be boatable?

15 A. Yes. Segment 6 is from Ashurst Dam down to
16 the Salt River confluence. Again, we're out of the
17 canyons. We're into the broad alluvial valleys. We'll
18 go past Florence down to the Gila -- the Salt River
19 confluence. It's a perennial stream but it was a losing
20 stream, declining in flow, as I mentioned. Again, pool
21 and riffle. There are no rapids in this section. Its
22 one major tributary, the Santa Cruz, which at this point
23 was frequently dry.

24 I'm going to show you just a little bit of
25 Segment 5 because this river is dead because of man's

1 influence.

2 Switching to 2006 here at 43 CFS, found some
3 coverage with a little bit of flow in it. But you can
4 see the character of the river changes drastically here
5 as it starts to dry up and disappear. And before we go
6 too much further downstream, we start to see a river
7 that's what we see when we drive over the Gila River on
8 I-10 on our way to Tucson or back up from Tucson, and it
9 doesn't look like a river hardly at all. And that's due
10 to the depletion of the flow, taking out the normal
11 river flow and using it for other purposes. I'm just
12 going to stop --

13 Q. And if the dam weren't there, would there be a
14 perennial flow of water in ordinary and natural
15 conditions down Segment 6?

16 A. Yes, there would.

17 VICE CHAIRMAN HENNESS: I would love to argue
18 with that one.

19 THE WITNESS: All right.

20 VICE CHAIRMAN HENNESS: But I'm not going to
21 waste your time. But your interpretation of the flow in
22 the Gila at that rate is different from mine.

23 THE WITNESS: Yeah.

24 BY MR. KATZ:

25 Q. When we get further down though, we have

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1 illustrations of historic boating through that segment;
2 do we not?

3 A. We do. We also have the flow records and we
4 have almost all of experts' testimony -- their testimony
5 is going to be this is a perennial segment and that the
6 median flow rates were well above zero.

7 Q. And what all of us have seen in this room in
8 our lifetime along Segment 6 wouldn't be what we would
9 have seen at or prior to 1912, correct?

10 A. Correct. We'll bring up the evidence for that
11 as we move along here.

12 Given the change, I thought it would be
13 appropriate to look at some historic maps. Now again,
14 these are also post-disturbance of the river but they
15 are early on in the history, and so they bring out some
16 relevant information and also some features that are
17 important to look at.

18 One is, we can see here, at the beginning of
19 the segment the red dot here which is close to the
20 location of the Ashurst-Hayden Dam. You can see that
21 the mapmakers changed the river from this constant blue
22 symbol to this dashed blue symbol where they were noting
23 that this is where flow disappeared just downstream of
24 that man-made diversion, the yellow arrow there. You
25 see that. You also see that the stream symbol that they

1 used to characterize the river consists of a single
2 channel and its relatively sinuous. It is not shown as
3 braided. This is by the mapmakers of the USGS in 1902.
4 That pattern continues on downstream.

5 Let me move further to the west. Again, we
6 see the stippled pattern here adjacent to the channel is
7 that high flow flood channel that has a more braided
8 characteristic to it. But you can see that the channel
9 itself is relatively sinuous and single channeled.
10 These maps are from 1902 and 1907, again from the USGS.

11 Moving further downstream, we go past the
12 community of Sacaton. I point that out because it comes
13 up in some of the historical descriptions. It sits
14 right here. There was a river crossing there. We move
15 downstream a little bit further, and these are maps from
16 '14 and '07. Here is a map change from 1914 to 1915,
17 which is interesting, because in 1914 in the upstream
18 segment up here they mapped this with a dashed pattern
19 indicating an intermittent or seasonally dry riverbed.
20 And downstream of that they chose to map it as using the
21 perennial stream symbol. Clearly not a change in flow
22 because it occurs exactly at the map boundary, but it
23 does depict the differing conditions observed and
24 characterized by different mapmakers working for the
25 same agency.

1 From the archaeologist's standpoint, Snaketown
2 is located right here. Long-term historical --
3 prehistoric archaeological site.

4 Moving further downstream, a couple of items
5 here. We see circled right here a community called
6 Pima Villages. That's a place name that comes up in a
7 number of the historical descriptions. And there's the
8 Santa Cruz River. It's coming in river left from the
9 west. The arrow right here is pointing at the only
10 place on the river where there's a marsh or a swampy
11 area where that symbol is used along the Gila River.
12 But it indicates that there was some marshy areas
13 adjacent to the river corridor there.

14 And finally moving downstream to the
15 confluence, a couple of things here I wanted to point
16 out on this site over here is a 1912 map, Phoenix
17 quadrangle. You see the Maricopa Villages which also
18 comes up in some of the historical accounts.

19 Another thing that I wanted to point out is,
20 as you can see, as we change from 1912 to 1948 that the
21 location of the local channel has shifted by about a
22 half mile from this point here to this point here. Yet
23 the character of how that stream was mapped by the
24 mapmakers is the same. So the location of the low flow
25 channel may shift, although its character is dominantly

1 the same.

2 Q. And you were just showing us slides 50 through
3 55, which are the historical maps to which you've been
4 making reference over the last couple of minutes,
5 correct?

6 A. That is correct.

7 Segment 7 is downstream of the Salt River. At
8 the Salt River the Gila River receives a boost in flow
9 or did in its ordinary and natural condition. And that
10 segment we're taking all the way down to the community
11 of Dome. It was a perennial segment, dominant inflow
12 from the Salt River. Its major tributaries, there are
13 other tributaries in that reach, the Hassayampa and the
14 Agua Fria, that contributed minor amounts of flow.

15 There are no rapids in this section.
16 Consisted of pool and riffle pattern. Sand-gravel
17 stream bed. Sinuous to straight main flow channel and
18 occurred within a very broad alluvial valley.

19 Q. And if I might ask, the Salt River would
20 perennially flow and contribute major quantities of
21 water into the Gila prior to the construction and
22 operation of the Roosevelt Dam and the subsequent dams,
23 correct?

24 A. That's correct.

25 Q. And similarly, the Verde River flows into the

1 Salt River and was also a contributing river into the
2 Gila via the Salt?

3 A. That's correct.

4 Q. And that has largely been dammed up by
5 Bartlett and Horseshoe Dams, correct?

6 A. That's correct.

7 Q. And if you would -- oh, one of the questions I
8 did have is, whether we're dealing with the Salt River
9 or the Gila River, one of the reasons that those
10 irrigation-related dams were built is that the water in
11 its natural condition was overallocated and there was
12 not sufficient natural flow to support the agricultural
13 diversions. Would that be substantially correct?

14 A. That is correct. And I'm basing that on the
15 accounts of the historical description of irrigation in
16 the State of Arizona that say that the rivers had plenty
17 of water for the irrigation up until the white man got
18 here and tried to farm more land than the rivers could
19 support.

20 Q. And that was sometime after the 1850s when we
21 started seeing more significant agricultural
22 development?

23 A. The agricultural development and diversions
24 began around 1860 or so.

25 Q. Thank you.

1 A. That was Segment 7.

2 VICE CHAIRMAN HENNESSY: How much effluence is
3 there?

4 THE WITNESS: Now? I think it's like 90 CFS
5 that comes out of the 91st Avenue wastewater treatment
6 plants.

7 We'll skip the flyover in Segment 7. It looks
8 like a dry riverbed.

9 BY MR. KATZ:

10 Q. Would it have looked like a dry riverbed in
11 1912 or in 1840?

12 A. No, not according to the descriptions, and
13 we'll focus on those as we move on downstream.

14 The last segment goes from Dome to the
15 Colorado River, and the reason I put this segment in
16 there is because of the difference in the type of use
17 that occurred in that segment.

18 River characteristics are probably almost
19 identical to the rest of Segment 7, but we had a
20 slightly different use where there was some historic
21 steamboat use and some floating of logs that indicate
22 that at least that segment of the river supported
23 different kinds of uses -- or at least we have
24 documentation of them.

25 VICE CHAIRMAN HENNESSY: Where in the world do

1 the logs come from?

2 THE WITNESS: Along the river corridor itself.
3 Certainly not from the hills around, if you've been down
4 to Yuma.

5 There are no rapids in this section. It's
6 kind of basically a sand bed, in a sinuous single
7 channel.

8 We also have some historic maps from this
9 segment in lieu of the flyover. Flyover was provided on
10 the DVD that the State submitted.

11 In the red circle there is the community of
12 Dome in which the ferry is noted on the U.S. Geological
13 Survey Topographic Map from 1926. So as late as 1926
14 the USGS mapmakers at least were noting that there still
15 was a ferry present or still had a historical presence
16 at that point.

17 BY MR. KATZ:

18 Q. Well, let me ask you this. There are those
19 that suggest that the use or ability to use this segment
20 for steamboats, which are fairly large crafts, correct?

21 A. They are.

22 Q. And the reason that that occurred was because
23 of major floods in the Colorado River watershed and this
24 was all just backwater; it wasn't natural flow within
25 the Gila. Do you agree with that proposition?

1 A. No. I do not. And the reason being as shown
2 in this slide right here, and also there was previously
3 a backwater report prepared for the Gila River. It was
4 submitted to the Commission in the past. It detailed
5 the extent of that backwater from the Colorado River,
6 and that was a relatively short segment. It's about 20
7 miles up to Dome. The backwater segment, as I recall,
8 was in the neighborhood of a mile or two. In fact, you
9 can see that on this map right here from the Yuma
10 quadrangle in 1903.

11 Q. And that's slide 62, and the prior map that
12 has the red circle on it was 61, correct?

13 A. Correct.

14 You see the Colorado River coming down in this
15 sinuous pattern right here with the Arizona-California
16 border down the middle of it. You also see the Gila
17 River coming in with this dry symbol, symbology used to
18 depict its corridor. And then you see it switches to
19 this perennial reach right here, which I interpret as
20 being backwater from the Colorado River after most of
21 the Gila River had been diverted and taken out of the
22 natural flow paths. So there is some backwater within
23 that reach, to answer your question, Paul, but it
24 certainly does not describe the river up to Dome.

25 VICE CHAIRMAN HENNESSY: So your argument is

1 that it's only about a mile or two miles of the lower
2 end of the Gila?

3 THE WITNESS: That there would be the
4 backwater, correct.

5 VICE CHAIRMAN HENNESS: There's backwater from
6 the Colorado. Not 20 miles.

7 THE WITNESS: Not 20 miles. And we have
8 historical descriptions of boating that went much
9 farther than just a mile or two up the river.

10 VICE CHAIRMAN HENNESS: What was the source of
11 that water?

12 THE WITNESS: The source of that water was the
13 natural flow of the Gila River.

14 VICE CHAIRMAN HENNESS: Hmm.

15 THE WITNESS: So in the Land Department
16 reports, it was divided by topic. These topics were the
17 ones provided: archaeology, history, descriptions of
18 the river, historical boating accounts, geology,
19 hydrology, rating curves -- where it's basically ways to
20 get flow depths -- and accounts of modern boating. And
21 I'll go through each of those topics hitting the
22 highlights of them. There's a lot more information in
23 the reports and the material that was provided as
24 supplements for these hearings, and I'm going to hit the
25 highlights.

1 BY MR. KATZ:

2 Q. And except for your highlights or any noted
3 additional information, you would be asking this
4 Commission in support of your testimony to look at the
5 2003 -- the two reports that you updated in 2003 that we
6 referenced earlier?

7 A. Yes, those reports and their appendices and
8 the material provided with them.

9 So the archaeology, the big lesson that you
10 want to take from the archaeology is that this river had
11 a thousand or more years of irrigation-based
12 civilization -- primarily in Segments 3, 5, 6, 7 and
13 8 -- not really in the bedrock canyon reaches. These
14 people were river-dependent people. Their identity was
15 tied to the river. Their use of the river speaks of a
16 perennial stream flow sufficient to support fish,
17 beaver, other wildlife, riparian vegetation. Not a
18 dried up dusty river, but a wet river with non-trivial
19 flow.

20 Q. And again, that archaeology and the history
21 that you'll be discussing shortly depict Native American
22 civilizations along the middle and lower Gila River that
23 were sustainable agricultural communities or
24 civilizations, correct?

25 A. Correct.

1 Q. And the history doesn't suggest that they were
2 wandering from place to place or were nomadic, correct?

3 A. Not the river tribes, no.

4 Q. And the river tribes in order to have
5 sustained year-round agriculture would have had to have
6 a perennial flow of water down those segments of the
7 Gila River, correct?

8 A. They would need a reliable source of flow,
9 correct.

10 VICE CHAIRMAN HENNESS: Jon, from the
11 standpoint of archeology, how do you explain the Hohokam
12 leaving the country in a generally considered drought?
13 And what segment was that?

14 THE WITNESS: Yeah. Well, there's a bigger
15 argument than we've got time for in a week. I think if
16 I knew the answer to why the Hohokam disappeared -- if
17 they did disappear -- I'd have a PhD in archaeology. I
18 don't know the answer to that. I know it's been
19 suggested that it related to a concentrated period of
20 flooding. It's been suggested that it related to just
21 overuse of the river. Some aspect of climate cycles,
22 lots of potential suggestions. But the fact that
23 remains is that they were here for a long period of time
24 and they developed very complex irrigation systems that
25 used the river water.

1 VICE CHAIRMAN HENNESSY: Indeed, but they also
2 left.

3 THE WITNESS: They did. But I'm not aware of
4 any definitive proof that said they left because the
5 river dried up for a sustained period of time.

6 BY MR. KATZ:

7 Q. And they were there from about 500 BC to about
8 1450 or 1500?

9 A. Yes, in the mid 1400s is when they were
10 thought to have -- the society changed. Whether they
11 left or not is a different question.

12 Q. And if there was a period of five or ten years
13 of extraordinary flooding or long-term drought, would
14 that be ordinary in terms of this river?

15 A. I would say no.

16 Q. Please proceed.

17 A. One aspect of the archaeology was these canals
18 that they developed. These canals were not trivial
19 little ditches. Some of the individual canals had
20 capacity for up to 240 CFS. There were tens of
21 thousands of acres that were irrigated, and the fact
22 that they were doing it for long periods of time speaks
23 to river stability, both in position and in the flow
24 rate. So it was sufficiently stable to have diversions
25 over long periods of time.

1 Q. And compared to the diversions of modern
2 times, these were de minimis or relatively small even
3 though they were not miniscule. Or let me ask it in
4 another way. They had over 200 miles of canals that
5 were developed, correct?

6 A. There were hundreds of miles of canals, yes.

7 Q. But compared to the diversions of today, they
8 were relatively small?

9 A. Some of them were smaller than today's, some
10 of today's diversions. Some of them were bigger than
11 some of today's. In cumulative, today we have a much
12 greater capacity to divert the river than they did at
13 that time.

14 Q. Again, by and large, even though they may have
15 been diverting water to adjacent agricultural lands,
16 back then a good deal of that water that wasn't soaked
17 up by crops or evaporated would flow back into the
18 river, correct?

19 A. Yes.

20 Q. And they weren't pumping large quantities of
21 groundwater. They didn't have the technology to do that
22 in 400 BC or 1500?

23 A. They did not have technology for deep water
24 pumping.

25 Q. And while part of the recharge of any river is

1 from the groundwater, whether that seeped into the
2 ground a hundred years ago or a thousand years ago or is
3 the result of irrigation waters percolating back down
4 into the ground table?

5 A. There was a number of statements in there
6 so --

7 Q. Okay. What I'm -- I guess what I'm trying to
8 simply ask you and take the lawyer's hat off, is whether
9 or not the river, Gila River would have been recharged
10 by groundwater if there was groundwater available?

11 A. Yeah, I'm not sure recharge is the right word,
12 but there were portions of the Gila River that received
13 flow from the ground, from groundwater, correct.

14 Q. And some of that would have been the result of
15 precipitation?

16 A. Absolutely.

17 Q. And some of that would have also been the
18 overflow of irrigation waters percolating back down into
19 the ground?

20 A. Correct.

21 Q. Please proceed.

22 A. Here are some maps of some of the
23 archaeological sites along the river. This one happens
24 to be near Buckeye. Some of the canals just downstream
25 of the Agua Fria River confluence showing their

1 orientation. In regard to the question Paul just asked,
2 some of the earliest Anglo canals simply cleaned out the
3 old Hohokam canals, so they were of similar size and
4 location. Other sites along the river -- and I'm not
5 going to draw this out in any great detail -- but there
6 were archaeological sites between Yuma and Phoenix along
7 the river in that segment as well as from the Salt River
8 confluence up to Florence, as well as from Florence up
9 to Safford, and in the above Safford reach up into the
10 Duncan-Virden Valley as well.

11 There's limited information in the
12 archaeological records about Native American use of
13 Native American boating. But there are a few things.
14 The Tohono have an account in their mythology about the
15 use of a canoe in a large flood. Also it indicates that
16 they at least had familiarity with the technology of
17 canoeing. Evidence of using wooden rafts on the lower
18 Gila in Segments 7 and 8, possibly on the middle Gila,
19 according to archeologists. Generally were constructed
20 of perishable materials. Use of bull boats in the upper
21 Gila in Segments 2 and 3 by the Apache.

22 Q. What are bull boats?

23 A. Bull hide stretched over a wooden frame.

24 The earliest Spanish explorers coming through
25 called the Gila River the Rio de las Balsas, river of

1 rafts. And Granger, one of the early Arizona historians
2 notes the Indians used wicker baskets to cross the river
3 but clearly these were not boat-dominated societies.

4 Q. And again those archaeological findings you've
5 been making reference to are pages 67 through 72 -- or
6 slide numbers 67 to 72, correct?

7 A. Correct. So there are isolated accounts of
8 those things.

9 Then we move to the Euro-American history of
10 Arizona beginning around 1820 when the trappers arrived.
11 And what we see here is some key dates on the bullets,
12 and on the bottom we see a chart of population which
13 tell you how many people were here in Arizona at what
14 time relative to what things were happening. So there
15 were not many people. As I mentioned this morning,
16 there were less than 10,000 people in 1870 in the
17 territory of Arizona. When trappers got here, there
18 were obviously much fewer than that. By the time we had
19 population starting to flow in around 1849 and the gold
20 rush, people coming through the state using it as a
21 transportation route through the state, there were still
22 very few people in here. And at that time it was
23 still -- the south part of the Gila River was not part
24 of the United States. Shortly after that, began
25 irrigating and diverting water off so that ordinary and

1 natural condition did not exist long after the people
2 came here.

3 Now, the railroad was available as an
4 alternative to transportation as early as 1871 at Yuma
5 and across the state within ten years. And
6 coincidentally, perhaps not, you see that the population
7 rises shortly after that date but also notes with
8 respect to the Gila River history that the Apache wars
9 did not end until 1886. So for much of the Gila, a
10 hostile Indian threat was a reality in terms of
11 settling, using, occupying the river.

12 Early exploration of Arizona, some of it did
13 come along the Gila River corridor. The Kearny
14 Expedition was one of those. Some soldiers that came
15 along were Carson and Emory, and you probably will hear
16 or have seen descriptions of the river from those
17 individuals.

18 Most travelers, however, did not take --
19 follow the river directly. They followed Cooke's route
20 that went away from the Gila.

21 Bartlett Boundary Survey, 1850s, was another
22 one. Keep in mind he was surveying the boundary. He
23 was not doing a title navigability study. So he makes
24 descriptions of the river that reflect his purpose as
25 setting a boundary. So he talks about the river being

1 unstable as a boundary or as an international boundary.
2 So sure enough, the low flow channel does move around a
3 lot. In fact, I've got a pretty good story about the
4 limitrophe reached of the Colorado south of Yuma, for
5 modern days about our border patrol not understanding
6 the difference between the legal boundary and the river
7 location -- but I'll spare you that today.

8 We mentioned before that Whipple as part of
9 that survey described the Gila canyon below what's now
10 San Carlos Reservoir as being impractical -- but as a
11 wagon route not as a boating route.

12 The treaty of Guadalupe Hildago specifically
13 mentions navigation, preserving navigation on the Gila.

14 In regards to the Gadsden Purchase, I would
15 note that travel in Mexico in the time prior to that
16 purchase, Mexico was aggressively trying to permit,
17 regulate and otherwise hinder travel by Anglos through
18 their territory.

19 So it gets to the question of -- I hear this
20 question a lot, for these hearings and previously -- why
21 didn't trappers boat the Gila? We talked this morning a
22 lot about why not use a boat if the river was navigable.
23 There are lots of reasons. We went through those.
24 Specifically when it relates to the trappers. First of
25 all, some did. Some built and used canoes. In some

1 cases the river didn't necessarily go where they were
2 going. Also, they traveled over land to get to Arizona.
3 So they had skipped other navigable rivers on their way
4 here. So it's not entirely surprising that they would
5 skip the navigable Gila when they got here. They got
6 here by wagon. They got here by horseback. They were
7 leaving by horseback. So it makes sense for them not to
8 have abandoned their horses and whatever they used to
9 get here. Build a boat, go west, work their way back
10 upstream and then do what? So they still needed their
11 horses and they were able to travel over land fairly
12 easy, so it makes sense that they kept whatever means of
13 transportation they had.

14 Furthermore, the marketplace they were taking
15 their sales wasn't in Yuma. It was in St. Louis. So
16 they had a lot of over land travel to do to get back
17 where they were going to sell their goods. And there
18 were fords. There were alternative routes that did not
19 require them to take the river.

20 When they got to the Colorado, the question is
21 well, why did they not float the Gila but they did the
22 Colorado. The Colorado River to get to the other side,
23 you need a boat. It's less fordable. It doesn't mean
24 it's not boatable. It means it's deeper and wider.

25 BY MR. KATZ:

1 Q. Let me also ask you, are you familiar with
2 other historical accounts of trappers on western rivers
3 other than in Arizona?

4 A. Some.

5 Q. And it wasn't unusual for a trapper that might
6 have come here from places not on river but on horseback
7 to build a boat when they came to a navigable stream if
8 there were materials, such as Cottonwood trees or other
9 appropriate materials for the construction of a boat,
10 correct?

11 A. Some built boats, yes.

12 Q. There isn't an abundance of lumber or other
13 materials along the Gila River when you get to it from
14 out of state from which you could on the spot build a
15 boat?

16 A. The account of Joseph Ives that I gave this
17 morning specifically mentioned that given the lack of
18 materials for boat building, they were glad they had
19 their Buchanan boats along.

20 Q. And I hate to change our focus to Lewis and
21 Clark, but during their expedition, once they were off
22 the Missouri, I believe they spent a winter in Montana,
23 and about 32 out of 44 or thereabouts of the men and
24 women who were on that expedition then built dugout
25 canoes with the assistance of Native Americans and

1 boated the Columbia in those man-made canoes down to
2 Oregon -- or the Pacific. Are you aware of that?

3 A. Yes, I am. I've heard that same story.

4 Q. And again, those were constructed out of wood
5 that was readily available, presumably, in those areas?

6 A. Right. So they switched boat types as they
7 went along, found something that worked for them.

8 Q. Please feel free to proceed.

9 A. Okay. So it brings us to a number of the
10 historical descriptions of the river. It's important
11 when you look at these descriptions -- because there are
12 a lot of them -- and they describe varying conditions.
13 Think about, well, what segment --

14 CHAIRMAN NOBLE: Mr. Fuller, why don't we take
15 a break now.

16 THE WITNESS: Fine by me.

17 CHAIRMAN NOBLE: Looks like this next segment
18 of your presentation might run for a few slides.

19 THE WITNESS: It does indeed.

20 (Recessed from 2:13 p.m. to 2:25 p.m.)

21 CHAIRMAN NOBLE: We welcome you back to
22 Day 4 -- I mean Session 4.

23 THE WITNESS: Just feels that way.

24 CHAIRMAN NOBLE: Mr. Katz, you may proceed.

25 MR. KATZ: Thank you very much.

1 BY MR. KATZ:

2 Q. Mr. Fuller, without further ado, whenever
3 you're ready.

4 A. All right. So we'll talk for a few minutes
5 about some of the descriptions of the historical
6 conditions on the Gila River, and as we look at these
7 descriptions, it's important to be thinking about what
8 segment that is being described. As you mentioned, the
9 reason for thinking about segments of the river is that
10 the geology and the conditions vary significantly over
11 the course of the river's path from New Mexico to the
12 Colorado River. We also need to think about what time
13 of year in light of those seasonal fluctuations of the
14 river that I showed you this morning in terms of high
15 flow period, low flow period. And also think about, is
16 this a description of a flood or an unusual drought,
17 because we want to be thinking about descriptions that
18 are indicative of the ordinary and natural condition of
19 the river.

20 We also want to think about the time period of
21 when that description was made to make sure that we're
22 thinking -- there were -- actually somebody was seeing
23 something that's fairly close to or really was the
24 ordinary and natural condition of the river and not a
25 disturbed condition that's post-depletion of flow.

1 And also you need to consider the point of
2 view and attitude of the observer. For instance, I had
3 mentioned Joseph Ives earlier today. He's the origin of
4 the famous quote about having seen the Grand Canyon and
5 thinking that he was the first Euro-American to have
6 seen it. And I'll read it for you. He says, "Ours has
7 been the first and will doubtless be the last party of
8 whites to visit this profitless locality," speaking of
9 the Grand Canyon which, of course, is absolutely untrue
10 and it's an incredible resource for the state.

11 But, you know, in his mindset, whatever his
12 mood was that day, he looked at the Grand Canyon and saw
13 horrible wasteland where others have seen incredible
14 resource.

15 So we see the same kind of thing. There's one
16 historical description of the Duncan Valley as being a
17 vast wasteland, and today, of course, it's a highly
18 profitable agricultural area.

19 So some people may just have been grumpy when
20 they were describing it. Some people may be a little
21 bit overenthusiastic. It's important to look at the
22 whole suite of descriptions and try to decipher from
23 that what was the character of the river by segment at
24 that particular time of year when they saw it.

25 By way of illustrating that, if we look at

1 this, this is a citation from the Land Department's
2 report from the U.S. Army reports from the Bartlett
3 Boundary Surveys where in one chapter they describe the
4 Gila River being a half mile wide and twelve feet deep,
5 wide bottoms and lagoons, and the Pimas were irrigating
6 field crops in a six to eight mile wide river bottom.
7 So they're talking about this verdant wet valley, and in
8 the same series of reports they're also describing the
9 river as being dry, a few locations in mid February.

10 And then in another volume they say, well,
11 water was not available during certain seasons but that
12 logs could probably be delivered from the Mogollon down
13 the Gila, and that river was approximately 9 feet deep
14 for 35 miles up from the mouth during low water.

15 So you take all that and you scratch your head
16 a little bit and go, I wonder what they were seeing,
17 what their attitude was. And so again, rather than
18 relying on any single quote or a single description,
19 we're going to try and look at the suite of quotes and
20 get a feel for what the river looked like.

21 Q. And again, the factors that you're asking us
22 to all consider with respect to interpretation of these
23 river descriptions are contained at Pages 76 and 77 of
24 your presentation; 73 through 75 were your summary of
25 historical findings, correct?

1 A. That's correct.

2 Q. Please proceed.

3 A. Now at slide 78. Some of the earliest
4 descriptions by Anglos were from Coronado in the late
5 16th century. He describes Segment 5 -- we believe
6 that's where he was at -- as a deep and reedy stream.

7 Father Kino just before 1700 described the
8 segment near the Pima Villages -- and I showed you that
9 location of the Pima Villages -- as a channel with large
10 cottonwoods, irrigation, agriculture, and fishermen that
11 used nets all year-round.

12 Q. And in today's world Segment 6 is virtually
13 desert, correct?

14 A. It is. The water is gone from that segment of
15 the Gila River.

16 Q. So what was described as large cottonwoods --
17 I mean with large cottonwoods and irrigation,
18 agriculture, large cottonwoods take a few years to grow,
19 correct?

20 A. Oh, yes.

21 Q. And we're talking about riparian vegetation in
22 Segment 6 that's no longer present?

23 A. For the most part, that's correct.

24 Q. And again, we're talking about fishing with
25 nets all year?

1 A. Yeah. There are no fish nets in that segment
2 now.

3 Q. Go ahead.

4 A. Moving on, de Escalante, Segment 6. He
5 describes the river as being too deep to ford in
6 November, which is typically one of the lower periods of
7 flow.

8 De Anza, 1775, the upper Gila, 6, 7 and 8,
9 describes it also dry, also as halfway up legs, reaching
10 the horses' shoulders, very deep, flowing slowly.

11 James Ohio Pattie, one of the trappers in the
12 1820s, describes the river in general -- and that's what
13 I mean by all segments -- as being beautiful, running
14 between banks with tall cottonwoods and willows and
15 plenty of beaver.

16 Segment 7 specifically, 200 yards wide -- 600
17 feet -- and too deep to ford, and reports that he built
18 a canoe to be able to trap both sides of the river.

19 Q. And you'll get into further discussion later
20 on of James Ohio Pattie's excursions, correct?

21 A. Correct.

22 Q. And he indicated that he traveled from Safford
23 to Yuma on several occasions by boat?

24 A. According to G.P. Davis' master's thesis,
25 that's what they recorded, yes.

1 Q. Go ahead.

2 A. The Kearny Expedition, I've talked about them
3 a little bit. Again, they were out doing mapping and
4 looking for transportation routes. They describe
5 Segment 7 as being 80 yards wide, 3 feet deep with a
6 rapid current.

7 In 1846 they said the river was navigable as
8 far as the Pima Villages -- which is up in Segment 6 --
9 possibly with small boats at all stages.

10 In 1853 he decided that it was not navigable
11 but also called it a never failing stream with a large
12 volume of flow and large fish.

13 One of their members, Turner, described the
14 river in Segment 7 as being 100-150 yards wide, average
15 depth of 4 feet, deep enough for a steamboat.

16 Segment 1, up near the New Mexico line,
17 described it as being 30 feet wide, a foot deep on the
18 shallows and pebbly bed and fringed with trees.

19 So again, some of these descriptions are
20 contradictory, and we're looking at the broader picture.

21 The Mormon Battalion that came through in
22 1847, describing Segment 7, which is below the Salt
23 River confluence as being 4 to 5 feet deep, 150 yards
24 wide.

25 Government survey, survey of 1846, Segment 7,

1 river is 3 feet deep, 60 to 80 yards wide. Three to 4
2 feet deep, 150 yards wide.

3 Some of the Forty-Niners describing the Gila
4 River principally below the confluence with the Salt,
5 and a little bit above, Segment 6, a deep, narrow and
6 rapid stream. And the whole stream is drawn off for
7 irrigation. Again, in 1849. Let that settle in. So in
8 1849 the whole stream is drawn off for irrigation.
9 That's ordinary and natural condition, 1849.

10 In August, deep, narrow, rapid, muddy, tall
11 cottonwoods.

12 Segment 1, 12 yards wide, foot and a half
13 deep, abounds with trout.

14 Segment 7, again the Forty-Niners, 300 feet
15 wide, deep enough for swimmers. River occupied a
16 quarter of the bottomland. Broad and shallow. Audubon
17 traveling along with those groups called it 18 to 20
18 inches deep. Deep holes in places.

19 Again from the Boundary Surveyors -- I'm on
20 slide 85 here -- 9 feet deep and 35 miles above the
21 mouth during the low water. 12 feet deep, dry in mid
22 February. Again, recalling their purpose.

23 Boundary Surveyors, Bartlett, Segment 6, low
24 flow, navigation is doubtful. Completely dry at the
25 Pima Villages due to irrigation. 50 yards wide and 9

1 inches deep elsewhere in Segment 6.

2 In Segment 5, 20 feet wide, 12 inches deep.
3 These are GLO Surveyors, and in their crossings they
4 describe it variably as a fine stream, smooth, lively
5 current, abundance of water, plenty of water. 12 to 15
6 feet deep. 18 inches to 2 feet deep.

7 Moving up into Segment 7, again, more and more
8 all discussing the presence of water, permanence of
9 water, the fact that water is an expected sort of thing
10 in the river.

11 And again in Segment 6 and in 5. Segment 6 is
12 describing it as dry in June, which typically is the low
13 flow period of the year. And later in 1878 there was an
14 abundance of water in Segment 5, which is up in the
15 Winkelman to the Kelvin reach.

16 A little easier to interpret pictures. There
17 are a number of pictures --

18 Q. Again, the river descriptions themselves were
19 contained at slide 76 through 88, correct?

20 A. In my presentation and also outlined in the
21 history chapter of the State Land Department reports.

22 Q. Can you explain a little bit what the purpose
23 of the GLO Surveyor surveys were and whether they were
24 focused on determining navigability or what the essence
25 of what they were doing involved?

1 A. They were setting up the basic land ownership
2 grid, a land descriptive grid for the State of Arizona.
3 So there is a north-south, east-west grid that describes
4 locations in the State of Arizona, and they were doing
5 the original survey to set those boundary markers and
6 whatnot. If they passed geographic features, they would
7 sometimes make note of them. I think you're going to
8 hear Dr. Littlefield talk to you a lot about GLO
9 Surveyors later in this week if he speaks. But they
10 were clearly not doing title navigability studies. They
11 were describing conditions of the river at the time they
12 were there.

13 Q. And most of their studies were done between
14 the 1870s and the 1890s after there was already a
15 significant amount of settlement that over time was
16 taking place?

17 A. I can't speak to whether most of them were
18 done in that time period. There were certainly a number
19 of them that were done in that time period. Some later.

20 Q. And on Page 87, two slides ago, those were all
21 trips that were taken between 1868 and 1890, correct?

22 A. Yeah, those are dates that are listed there.
23 Those are the publication dates for those surveys.

24 Again, we're seeing some pictures right here.
25 This is 1885. Gila River near Ft. Thomas. Not a

1 braided stream. It's a single channel such as we saw in
2 our Google Earth flyover.

3 Gila River, I'm not sure of the exact location
4 of this. Looks to me to be Segment 3. Army crossing
5 the river in wagons. They are not boating it. I get
6 that. However, I would note the depths there where it's
7 up to the -- they call this the chest of a horse, the
8 top of their legs.

9 VICE CHAIRMAN HENNESS: No.

10 BY MR. KATZ:

11 Q. And under those conditions, if you wanted to,
12 could you float a canoe or a flatboat?

13 A. Absolutely.

14 THE WITNESS: Now, I'm looking at the horses
15 in the background, Jim, not the ones in the foreground.

16 VICE CHAIRMAN HENNESS: I thought they were
17 Shetlands.

18 THE WITNESS: Pardon me?

19 CHAIRMAN NOBLE: Mr. Fuller --

20 THE WITNESS: Sir?

21 CHAIRMAN NOBLE: -- could I ask you a
22 question? Going back to your slide that begins
23 Coronado, 16 something or something like that. It's the
24 beginning of your river descriptions.

25 THE WITNESS: Yes.

1 CHAIRMAN NOBLE: Or at the beginning. You
2 have your river descriptions, it's the second slide in
3 that series.

4 MR. KATZ: 78.

5 THE WITNESS: Slide 78.

6 CHAIRMAN NOBLE: Okay. Well, unfortunately,
7 the numbers on my pages are not readable. I couldn't
8 tell you what it was. Anyway, you go down through
9 there, and you come to the photographs. Is this the
10 first time you've presented that information to the
11 Commission?

12 THE WITNESS: Regarding Coronado or the
13 photographs?

14 CHAIRMAN NOBLE: All those -- no, all of those
15 slides that follow the Coronado slide. The one that
16 talks about Coronado and the Escalante and Pattie and
17 Kearny and the Morman Battalion, the Forty-Niners and
18 second Forty-Niners slide, and the U.S. Army and the
19 Boundary Surveyors, is that the first time you've
20 presented that information on those slides to the
21 Commission?

22 THE WITNESS: No, that information is in the
23 Land Department reports.

24 CHAIRMAN NOBLE: From previous presentations
25 to the Commission?

1 THE WITNESS: Yes.

2 CHAIRMAN NOBLE: Thank you.

3 THE WITNESS: And if not in presentations, in
4 the reports themselves or the information that came with
5 it.

6 Okay. So we are now on slide 90, which is
7 titled Historical Photographs and has a picture of the
8 infantry crossing the Gila River. Mr. Katz was asking
9 me a question about whether the depths indicated by the
10 flowing water against the wagons and the horses would be
11 sufficient to float low draft boats, and I answered yes.

12 This is a picture of the Duncan -- the Gila
13 River in the Duncan Valley. And again, single channel,
14 nonbraided, well-defined channel. Looks a lot like that
15 today.

16 The next photograph on slide No. 92 is a
17 picture that was taken from the Burkham report. I
18 showed you that early this morning when we were talking
19 about his distinction of what the channel was versus the
20 low flow or main channel.

21 BY MR. KATZ:

22 Q. And when I first looked at this, that first
23 dark -- there's the light area, then a dark area. I was
24 originally thinking that that was the main channel, but
25 it is not, correct?

1 A. That's correct. Burkham would say this is the
2 channel across there. You and I, I would hope, would
3 agree that the channel is this lighter colored, highly
4 reflective. That's where the water is. That's what
5 you're seeing there. That's water. That's sand.

6 Q. That's slide 92 from May of 1909, correct?

7 A. And again, this is well into the period of
8 disturbed conditions, well beyond ordinary and natural.

9 Further upstream, 1928, looking downstream
10 from the present location of the Coolidge Dam and a
11 comparative photo from today. And again, they look
12 relatively similar. In this case, a little bit more
13 vegetation. Note that the '94 photos are after the '93
14 flood and a certain amount of cleanout of vegetation
15 occurred during the '93 releases.

16 Gila River near Kelvin in September of 1915,
17 single channel, not braided. Gila River near Kelvin.
18 Further you see a little more high flow braiding out in
19 there, but a well defined main channel within that area.

20 This is from 1908. Again, post-disturbance.
21 This photograph here is the Gila River, a bridge being
22 repaired. I brought this -- I stuck this in here for a
23 couple of reasons. You can see some interesting
24 features here. The guy sitting in the boat is one of
25 them. The boat, on the back of it says No. 5. That

1 makes me wonder if there's a 1 through 4 sitting around
2 somewhere or perhaps a 6 through 10. Folks are in this
3 boat, and they're in the boat despite the fact that over
4 here in this part of the river you can drop a ladder
5 down to the bottom, but over here you need a boat. So
6 that speaks to low flow channel; and then after this
7 recent flood, there's an inundated area that was swept
8 clean of vegetation, and there's much shallower water
9 out here. But the fallway, if you will, the main part
10 of the channel is off to river left.

11 Q. Again, this is after the flood, the river may
12 not have recessed totally, but you're not in a major
13 flood at the time this photograph is being taken?

14 A. It does not appear to be, no.

15 VICE CHAIRMAN HENNESS: You don't know where
16 that was, do you?

17 THE WITNESS: I don't know. This is from
18 Dr. Littlefield's report. He may know the exact
19 location there.

20 1905 flood was a very unusually large flow
21 event, particularly in terms of volume and was
22 relatively destructive throughout the state.

23 In looking downstream at the Wilton Crossing,
24 again, 1910, fairly far into the period of disturbance
25 of the river, and you see that river corridor down

1 through the middle.

2 So this is what I draw from these photographs
3 and these historical descriptions, is that dominantly I
4 saw a river channel that was a single channel. It was
5 described mostly as a river with relatively moderate
6 depths ranging from a foot to four feet, occasionally
7 greater than that. But I would say that was kind of the
8 sweet spot of the range of descriptions. There were
9 some areas that were deeper. The widths were relatively
10 moderate as well, 20 to 150 yards, let's say. Some
11 subjects -- some of the reach segments are subject to
12 seasonal and annual fluctuations where we see some
13 segments that are periodically dry, but dominantly the
14 descriptions were of a wet river with reliable,
15 significant flow volumes, and also a river that was
16 characterized by a corridor of vegetation along it. I
17 would say that would be the overall characteristic of
18 the Gila River through all of its segments in Arizona in
19 its ordinary and natural condition.

20 Q. And the corridor of vegetation would have
21 normally been cottonwoods and willows and not the
22 invasive Tamarisks that we see today?

23 A. No, the Tamarisks came in in the '20s and
24 '30s, as I recall. So that was a post-statehood change
25 in the river condition.

1 Q. And just for the record, the photographs were
2 of slides 89 through 97, and the summary of these river
3 descriptions is at slide 98 where we're currently at,
4 correct?

5 A. Correct. And I just flipped the slide to
6 slide 99.

7 At this point I want to talk about some of the
8 historical accounts of boating. And I mentioned this
9 morning when I was talking about boating in general that
10 there are historical accounts. There are a number of
11 them. Some of them were in the previous reports. Some
12 of them have been found since then, and we've tried to
13 supplement, and there was evidence that came in last
14 week of a few other ones that we hadn't found. So I
15 think you find that there will be more accounts the
16 longer you look, the more detailed you look.

17 There were steamboats that were used on the
18 Gila River, primarily in the 1860s after gold was found
19 around Gila City. There were some steamboats that ran
20 up to Dome. We can see that in some of these newspaper
21 articles.

22 There are also other boats that were used that
23 they were shipping firewood and they later switched to
24 just floating it on downstream and had a boom in the
25 river to collect that firewood.

1 Dr. Lingenfelter, his declaration states that
2 steamboats ran up to five miles during high water, which
3 is the same descriptor used for the Colorado River as
4 boating during high water. And they note gas-powered
5 steamers were used in the 1890s.

6 Tombstone Epitaph --

7 CHAIRMAN NOBLE: Mr. Fuller, where is Gila
8 City?

9 THE WITNESS: Gila City is about 20 miles up
10 the river. We're talking about Segment 8.

11 CHAIRMAN NOBLE: It no longer exists.

12 THE WITNESS: That's my understanding. I've
13 not seen it on a map.

14 CHAIRMAN NOBLE: I can assure you.

15 THE WITNESS: There's lots of parts of Arizona
16 that no longer exist that are sad to see go and some
17 that we're probably happy to see go.

18 Other historical accounts -- I'm trying to
19 move chronologically here. Chiricahua Apaches, those
20 are the ones who used the bullhide boats or bull boats
21 to cross the river. Also in wicker baskets. Don't know
22 a lot more about those accounts than that.

23 Again, as I mentioned earlier, the Spanish had
24 called the Gila River the Rio de las Balsas, that coming
25 from previous reports prepared and submitted to the

1 Commission.

2 James Ohio Pattie on slide 101, a character, a
3 trapper, came here in the 1820s. Made a couple of trips
4 to Arizona. Wrote about it in a diary. Other people
5 have written about him and the things that he's said and
6 done.

7 Segment 7 and 8, he said they had used a canoe
8 because the river was too deep to ford on horseback. It
9 doesn't say exactly where within those segments, but
10 that was his statement.

11 He also makes the statement they had -- a
12 statement that they had used -- they had made eight
13 dugout canoes and had a comfortable descent in these
14 canoes from Safford to Yuma. And he said, according to
15 G.P. Davis, who wrote his master's thesis in this area,
16 that it was done several times.

17 It is also described making rafts to escape an
18 Indian attack and that some other trappers had used
19 horsehide and wood frame boats in the course of their
20 trapping duties. Doesn't report any problems of any
21 kind in using those boats other than some harassment
22 from the Indians.

23 VICE CHAIRMAN HENNESS: But he did speak about
24 the number of beavers and beaver dams, no doubt, on the
25 Gila?

1 THE WITNESS: On the Gila? I don't -- I don't
2 recall any beaver dams on the Gila. I recall some
3 discussion of that on the San Pedro.

4 VICE CHAIRMAN HENNESS: You talked about
5 beaver --

6 THE WITNESS: Beaver -- not dams -- yes. Yes.
7 So that's what they were doing here. They were trapping
8 beaver on the Gila, the Salt, and the Verde.

9 BY MR. KATZ:

10 Q. And just to clarify, there are beaver on wider
11 or swifter flowing rivers that are bank dwelling and not
12 dam dwelling?

13 A. Yeah, I believe --

14 Q. Is that correct?

15 A. -- there's an affidavit from the Game and Fish
16 Department that described the use of the rivers by
17 beavers and what to expect in terms of dam building and
18 cliff dwelling or bank dwelling.

19 Q. So an abundance of beavers doesn't mean that
20 there was an obstruction to navigability at the time
21 that Mr. Pattie was going down the river?

22 A. In fact, from my understanding of what I've
23 read about beavers and my experience on rivers, I've
24 never seen a beaver dam on any of the -- the Gila River,
25 any of the places that I've boated or traveled.

1 Q. Okay.

2 A. Another account I'd like to stop and park at
3 for a little while is this slide 102. The account of
4 the Mormon Battalion, Colonel Cook and Lieutenant
5 Stoneman. And this has been brought up previously and
6 discussed in different ways. What I'd like to point out
7 is one thing, Colonel Cook himself, his quote is the
8 last bullet on the page there that he described the trip
9 as a complete failure. But in reading the documentation
10 of this particular account I note that the boats
11 actually arrived at their destination and they arrived
12 there faster than the ground troops. So what he meant
13 by a complete failure, he did not say. But it depends
14 on what you describe as a failure.

15 Also, you need to know that the boat that they
16 built was they took two wagons. They took the wheels
17 off it. They strapped Cottonwood logs to the outside of
18 it, piled on some more Cottonwood logs, and that was
19 their boat. They mention nothing about oars, poles,
20 rudder, anything like that, nor do they mention that
21 they had any experience using boats at all. So I would
22 suggest there's a couple things there. We have -- they
23 built the wrong boat where they quickly ran aground. It
24 was a first descent on a river that they had no
25 knowledge of boating on, apparently. They modified

1 their boat. They lightened their load. They separated
2 the wagons. They got rid of the Cottonwood logs, and
3 Lieutenant Stoneman boated down the rest of the river
4 without difficulty.

5 So it's a very normal first descent sort of
6 boating account. You put something on the river. It
7 doesn't necessarily work so well. You modify it. It
8 works better, and you achieve your goal.

9 Q. Let me ask you this. Does it make sense that
10 the military would have ventured to build a boat if they
11 felt that the river was not navigable?

12 A. Well, not everything the Army does makes
13 sense, but you would think that --

14 MR. SPARKS: Should have had the Marines build
15 it.

16 THE WITNESS: Yeah, you would think that a
17 bunch of folks sitting there in the heat looking at the
18 river wouldn't propose to build a boat if it was a dry
19 riverbed or it looked extremely shallow.

20 So, true, Mr. Cook said, Colonel Cook said it
21 was a failure. Not true, the boat did arrive and it got
22 there.

23 BY MR. KATZ:

24 Q. And again, we're dealing with not a properly
25 constructed boat, because they didn't know in advance

1 they would be using one?

2 A. It was a modified wagon. And in fact, when
3 the wagon got to Yuma, they sold it and used it as a
4 ferry across the Colorado River for a number of years.

5 Q. And there's no evidence that the individuals
6 that were piloting these ad hoc boats knew how to
7 navigate a river?

8 A. There was no evidence one way or the other
9 that they were experienced boatmen or not. They did
10 what experienced boatmen did in that they modified their
11 boat, made it work, achieved their objective.

12 Another trip from 1849 that we hear a lot
13 about is the Howard family trip, in part because Mrs.
14 Howard had a baby en route, named the baby boy Gila,
15 thought to be the first Euro-American born in Arizona
16 territory. This was a different sort of trip. They
17 actually built their wagon boat as a wagon boat. Put it
18 on Lake Michigan before they left. Tried it out. It
19 was a 16 by 5.5 wooden boat. It was decked. So it was
20 built to be used as a boat, and they used it without
21 serious incident. And according to their accounts, they
22 made the 250 miles from the Pima Villages down to Yuma
23 in three days. When they got there, they sold their
24 boat for \$300 and a wagon, put their belongings in the
25 wagon and continued down to California.

1 They boated portions of Segment 6, all of
2 Segment 7 and 8. They themselves described their
3 incident as being without incident -- described their
4 trip as being without incident. The newspaper called
5 them reckless voyagers; however, there was nothing
6 reckless that they said that they did. The Army sent
7 out some troops when they heard they were boating on
8 down the river. But it doesn't say whether they sent
9 out the troops because they were worried about an Indian
10 threat or whether they were worried about the boating
11 itself. But clearly, the folks who did the boating,
12 they described it as not having a problem. They
13 achieved their objective.

14 The Daily Tribune reported that lots of the
15 Forty-Niners were using boats. We don't know any other
16 facts than that except that they were boating to Yuma in
17 small boats.

18 The other account, folks named Hamilton,
19 Jordan and Halesworth, 1879 in January, boated from
20 Phoenix to Yuma. Part of that's obviously on the Salt
21 River, joined up with the Gila. And this was in a
22 homemade skiff and they paddled. And their declaration
23 after completing this trip was, the river was perfectly
24 practicable for navigation. They found one obstruction
25 in the form of rocks near Gila Bend. I would take that

1 to be near the location of the Gillespie Dam or the
2 remnants of the Gillespie Dam, and they concluded that
3 it would be easier for a flatboat loaded with produce to
4 make the trip through two feet or less. Their
5 conclusion was, yeah, more people ought to be boating
6 and it could be done to carry produce.

7 Cotton and Bingham in 1881. This is slide
8 106. Floated Segments 7 and 8, again, from Phoenix to
9 Yuma. And in an 18-foot skiff, flat-bottomed. We don't
10 know much more about that. We do know that they didn't
11 report any particular problems. They left Phoenix and
12 arrived in Yuma.

13 Q. And again, not all, but many of these
14 incidents are reported in various local newspapers and
15 those references are at the bottom of the slide?

16 A. That is correct. They're generally all from
17 newspaper reports. Some of them from other documents as
18 noted.

19 There was another kind of humorous account,
20 the Yuma or bus trip, a fellow named Bucky O'Neill, who
21 was apparently a character at the time. He went from --
22 reportedly from Phoenix to Yuma. The newspaper editor
23 decided that he had finished up in Gila Bend actually,
24 but he himself stated that he went to Yuma. The story
25 also accounts that a certain amount of liquor was

1 consumed and that they had a good deal of trouble
2 getting through some sandbars. They were seen pushing
3 their boat. It could be explained by low water; it
4 could be explained by the liquor, not exactly sure. We
5 do know that Bucky O'Neill was a bit of a character.
6 But nobody died. The boat and the boaters weren't hurt.
7 They had to push some so they had some occasional
8 difficulties, and it was not clear whether the pushing
9 that they were doing and where they were seen doing that
10 was on the Salt or the Gila. So it's a bit of a sketchy
11 account. It's one account in a host of others.
12 Probably can't make too much of it.

13 Two fellows named Stanley Sykes and Charlie
14 McLean in the winter of the 1890s. They're making this
15 recollection to a newspaper reporter fifty-two some
16 years after the report, after the actual episode of
17 boating, and they claim that they built a boat, canvas
18 over a wood frame and they put it in the Salt River, and
19 at the point they put it in the Salt River they
20 described it as being 15 to 20 foot wide and one foot
21 deep, and they had a number of dry reaches until they
22 reached the Gila confluence. They had some problems at
23 an irrigation diversion where they capsized. Put their
24 stuff back in the boat and continued to boat on. And
25 then they described that after that dam there was more

1 water and they made pretty good time to Yuma. So they
2 had a little bit trouble along the way, particularly
3 with low water up in the Phoenix area. And granted,
4 remember, this was in the 1890s and clearly it was at a
5 low water condition in a disturbed, not the ordinary and
6 natural condition. But even then, once they got to the
7 Gila and after the dam, they made pretty good time to
8 Yuma and reported no problems. The boats and the
9 boaters reached their destination.

10 Another account, these folks -- we don't know
11 their names -- it's an account in the Tombstone Epitaph.
12 Two men, they boated from New Mexico highlands down to
13 Yuma in a homemade wooden boat. They note that they
14 damaged or lost their boat in the canyon below San
15 Carlos Reservoir, which didn't exist at that time, that
16 Needle's Eye Wilderness area. But they built a new one.
17 They continued on, and they noted no other special
18 incidents. As I mentioned, when you're boating on
19 rivers, things happen. These folks sounded like they
20 were pretty hardy individuals. Their boat was damaged.
21 They built a new one. On they went.

22 Q. And again, the more experienced you are, not
23 only at boating, but boating a particular river, the
24 less likely there are risks or hazards that would be
25 presented?

1 A. That's correct. The more experienced you are,
2 just like you saw with the Powell Expedition. You know
3 the river, you know how to handle it, and you know what
4 kind of boat to use. In this case the boaters
5 themselves considered it a success.

6 The Day brothers in 1891 and 1892, they took a
7 long trip from Camp Verde on down to Yuma where they
8 were trapping, and they picked up beaver and otter.
9 They described it as very profitable. They reported no
10 problems. In fact, they planned on going back and doing
11 the same thing next year. We don't know whether they,
12 in fact, did it or whether it was newsworthy in the next
13 year or any other year. But that was certainly their
14 perspective having gone down the river. It was a
15 boatable river and they would do it again.

16 Another account of a long trip, this one from
17 Clifton which is on the San Francisco River into Segment
18 2 of the Gila River and the Gila Box and then on down to
19 Yuma, and they had a homemade wooden flatboat. It
20 was -- it would be an interesting boat to see a picture
21 of. It was 18 by 3.5 feet with some kind of cabin on it
22 to sleep in or store goods or something. They took the
23 boat on down to Sacaton. They took the train up to
24 Phoenix. It doesn't say why, whether to resupply, visit
25 folks. It just notes that they stayed there a couple of

1 days, and then they went on down to Yuma. The events
2 that they saw -- reported is they said below San Carlos
3 they had 81 miles of rough rapids and falls.
4 Interestingly, the actual mileage from the San Carlos
5 Canyon down to Winkelman is 28 miles, and there are no
6 falls in there. And then they reported that the river
7 was smooth below Winkelman, which is a true statement.
8 And that they hauled their boat and boated from Phoenix
9 to Yuma on the Salt and then the Gila. So they had a
10 little difficulty in that canyon. Maybe a function of
11 the kind of boat that they had. They described
12 something that they're lowering the boat on a 200-foot
13 rope. They're basically lining their boat through a
14 blind corner. And I have a pretty good idea of which
15 blind corner that is. And their boat got away from them
16 at that point. It got stuck. It was damaged. They
17 repaired it, and they went on down the river. They
18 paddled some, 60 some miles down to Sacaton from that
19 point. So clearly the boat was in pretty good condition
20 or in seaworthy condition. I would also note that
21 January and February is not typically high water for
22 that time of year.

23 Slide 112, Lieutenant Gully and Richardson,
24 sometime prior to 1896 -- don't know the exact date --
25 the Arizona Weekly Citizen reports that they went from

1 the Pima Villages in Segment 8 down to Yuma in a
2 homemade wooden boat. They report no incidents other
3 than some hostile Indians as they got close to the
4 Colorado.

5 Q. And Pima Villages would be Segment 6, not 8,
6 correct?

7 A. Did I say that?

8 Q. Yes, you said it.

9 A. Sorry. All right. Correction. Pima Villages
10 is in Segment 6.

11 An incident of floating logs in 1897, the LA
12 Harold reports that formerly they were bringing wood
13 down the Gila River on a raft -- used to be rafts -- and
14 now they decided instead of rafts they would just float
15 the logs down. It doesn't say where they got the logs,
16 but they were coming from upstream somewhere, and in the
17 swift current, they had to put a boom out in the river,
18 and they would collect them in the vicinity of the
19 prison in Yuma.

20 VICE CHAIRMAN HENNESS: The vicinity of what?

21 THE WITNESS: In the vicinity of Yuma, the
22 prison.

23 Jacob Shibley or Shipley -- depending on which
24 account you read -- in 1905, he took a boat from Phoenix
25 to Gila Bend. So a small segment, a small portion of

1 Segment 7. He did this in a wooden boat. He capsized
2 once. He reached Gila Bend. He determined he needed a
3 bigger boat. That was the opinion upon finishing his
4 trip. He said nobody should be out there unless the
5 boat was -- I forget the exact length. But some certain
6 length that was proposed.

7 I looked up the flow for that day. It was
8 about 11,000 CFS. So it was well above ordinary and
9 natural. I included this report, even though it's
10 basically a flood account in that it's been mentioned
11 previously, and I just wanted to put it in that context.

12 So he had a little difficulty, but he was
13 boating on some fairly high water. And I got that
14 estimate by adding up the Verde and the Salt gages. It
15 doesn't include any inflow from the Gila.

16 Granger reports that a guy named Stanley Sykes
17 boated from -- the entire length of the Gila. I'm
18 including this because it's listed in the Land
19 Department reports. My thought is that this is
20 referring to the other Sykes. So I'm not going to make
21 any more discussion of that, and I'm not counting this
22 as a new account.

23 Slide 116, we note that the GLO Surveyors, at
24 least on two instances, one in 1890 and one in 1911,
25 used boats in the completion of their duties needing to

1 cross the river, and this is one of those instances
2 where somebody needed a boat, and lo and behold, there
3 was a boat to be had. Even as late at 1911. On these
4 rivers, people had boats.

5 Another account, page 117 -- slide 117, HMT
6 Powell in 1849. It's described in McCroskey's report
7 saying that a heavily loaded vessel, it had some trouble
8 with sandbars, and navigation is only practical for
9 flatboats. This person's advice was, if you have heavy
10 loading, send it by boat from downstream of the Pima
11 Villages. So that was their conclusion upon completing
12 their voyages.

13 Nathaniel Jones was also a member of that
14 Mormon Battalion. Reports in addition to the boats
15 described previously, there may have been boats that
16 were made of wagons in which they put 12 ox in each.
17 And it doesn't describe anything about success or
18 failure, just that's what had been done. So if it was a
19 success, it was done without incident. If it was a
20 failure, it doesn't mention that it was a failure, which
21 seems like it wouldn't be something that would be
22 written about.

23 Some other accounts, just briefly. The
24 military in 1869 using a ferry to raft across the river
25 at high flow up near Fort Goodwin. 1883, the Weekly

1 Citizen reports that the Gila has been navigated to its
2 junction with the Santa Cruz. Certainly is consistent
3 with previous reports.

4 There is an account, a very brief account from
5 1886, February and March, describes the prospector who
6 built a dugout canoe and took it from Clifton to
7 Florence. And this is a case of what I would call a
8 boating failure. Now, keep in mind, this is a first
9 descent and it doesn't say anything about this guy's
10 boating experience and that dugouts are notoriously
11 tippy boats. But he took this boat without incident,
12 and he got to the canyon below what's now San Carlos
13 Reservoir, and experienced some problems with what he
14 called the Sawyer which is a strainer. He got his boat
15 tangled up in it. Flipped the boat. He lost his gear,
16 and it buried his boat. He lost his boat. And he
17 became -- whatever his reasons were, whether he was
18 frustrated or whatever, couldn't get his boat out from
19 underneath the water, we don't know. But he gave up
20 boating at that point and he walked into Florence.

21 VICE CHAIRMAN HENNESS: He walked into
22 Florence?

23 THE WITNESS: Florence.

24 VICE CHAIRMAN HENNESS: From the narrows below
25 the dam?

1 THE WITNESS: Yes.

2 BY MR. KATZ:

3 Q. That was a yes?

4 A. Yes. That was a yes.

5 He was a healthy individual, made the long
6 walk, I would guess that to be --

7 VICE CHAIRMAN HENNESS: 80 some miles.

8 THE WITNESS: Close on, yeah. So a goodly
9 long walk.

10 BY MR. KATZ:

11 Q. Let me just ask you this, because I don't
12 recall whether it's covered later, but a historic trader
13 or trapper that was an experienced canoeist, would they
14 secure or tie down their loads with the expectation that
15 they might flip over or capsize?

16 A. Yeah, if I were this guy's boss, I would ask
17 him why you didn't strap your load in. That's pretty
18 much a rookie boating mistake. You tie down your load.
19 It flips over, your load stays, stays in the boat.

20 Q. And your modern boating experience in your
21 various canoes, when you have camping gear, food, and
22 other supplies, do you just leave them untethered, or do
23 you do something to protect that load in the event of
24 tipping over or capsizing?

25 A. Even on the calmest rivers, I always strap my

1 loads in.

2 Q. And that would be a common practice
3 historically as well as in modern times?

4 A. Yes.

5 Q. Please go ahead.

6 VICE CHAIRMAN HENNESS: Jon, you speak, seems
7 these are all reasonably successful endeavors. Seemed
8 like to me a few years ago back in one of your prior
9 reports you talked about a military effort where they
10 were going to use the Gila below Gila Bend and gave up
11 on it.

12 THE WITNESS: You know, that's how we hear the
13 Stoneman account characterized sometimes, and that's my
14 initial understanding. The first time I read that, that
15 was the understanding I had, too. But as I looked into
16 the details of it, I found that the boats actually did
17 make it to Yuma. They had to lighten their loads and
18 modify their boats, but they did make it.

19 VICE CHAIRMAN HENNESS: So, in other words,
20 one should assume then that everybody that boated the
21 Salt on down and the Gila on down were successful?

22 THE WITNESS: Not everybody. Clearly, there
23 was this miner right here. The accounts that I've
24 found, they were during ordinary and natural conditions.
25 You're beating me to my summary here, sir, but by and

1 large, the boating was successful.

2 VICE CHAIRMAN HENNESS: Thank you.

3 THE WITNESS: Frank Burke and George Davis in
4 Segment 7, there was a newspaper account that they
5 were -- sounds like ferrying a load across the river,
6 flipped the boat, saved the gold -- good choice.
7 Recovered the gold. Put it on a train, and completed
8 their mission. I'll let you decide whether it's
9 ferrying accounts or whether that's a success or
10 failure.

11 I guess I would just say from boating
12 experience, those of you who boat rivers know that the
13 occasional flipping a boat, the occasional bumping into
14 a rock, the occasional hitting a sandbar is not that
15 unusual. And I think that's what the report was talking
16 about by the presence of occasional difficulties.

17 Again, I don't count boats during floods. I
18 think accounts of what happens during floods doesn't
19 represent the ordinary and natural condition and
20 shouldn't be considered in title navigability decisions.
21 But again, those boats always seem to be available if
22 somebody wants one.

23 VICE CHAIRMAN HENNESS: With 11,000 CFS, in
24 your opinion, that would be pretty -- more than a normal
25 flow?

1 THE WITNESS: Yes. That would be outside the
2 90 percent chance of flow. And we'll see --

3 VICE CHAIRMAN HENNESS: But you included it in
4 here.

5 THE WITNESS: I threw it in here because it
6 was an account that's been discussed in the past. I'm
7 not counting that in my summary.

8 There were ferries. I showed you a picture
9 this morning. There were ferries along the Gila in
10 Segments 5, 6, 7, and 8, and the one in Maricopa Wells
11 apparently was there for 25 years.

12 Again, the use of ferries declined as bridges
13 were built, as the railroad became present, and there
14 are other ways to get across the river and as the rivers
15 became diverted and more dry.

16 BY MR. KATZ:

17 Q. And even though we have the Maricopa Wells
18 ferry that was operating for 25 years, the river, as we
19 look at it today within Segment 6, is essentially dry
20 because of damming and diversion?

21 A. Yes, it is.

22 So, are these --

23 VICE CHAIRMAN HENNESS: Segment 6 is from
24 where to where?

25 THE WITNESS: Segment 6 is from the Salt River

1 confluence upstream to Ashurst-Hayden.

2 So were these successes or were they failures?

3 I would define a success is the boat, the passengers,
4 and the cargo arrive.

5 I would define the definition of a failed
6 boating account is there was a death or serious injury,
7 the cargo was completely lost and not recovered, the
8 boat was destroyed and not repairable, and the trip was
9 not completed. That's what I would say is an example of
10 a boating failure. However, I also note that those
11 kinds of boating failures occur on lots of navigable
12 rivers. For instance, the Mississippi is replete with
13 accounts of things that -- people who have died, cargo
14 that's been lost, boats have been destroyed and trips
15 not completed. So by virtue of the fact that somebody
16 had a problem on the river doesn't necessarily make it
17 nonnavigable.

18 Things that I would say do not count as
19 failures is some kind of a difficulty or problem that
20 was resolved during the trip. So if I got stuck on a
21 sandbar temporarily, pushed myself off, that's not a
22 failure. That's just an occasional difficulty. That's
23 just part of boating.

24 Flipping a small boat, a low draft boat, that
25 is also not that unusual. Certainly not desired, but

1 occasionally it happens. Occasionally it happened on a
2 line or portage or on an obstacle. That is also not a
3 failed boating attempt. Having to modify your boat to
4 fit the condition, particularly if it's a first descent
5 and you're using a homemade boat, it's also not unusual.
6 I mentioned the Stone Expedition in the Grand Canyon
7 where they actually cut their boat in half and shortened
8 it by 4 feet, rebuilt the boat, and continued on.

9 Similarly, I would not describe as a failure
10 having a newspaper editor describe you as daring or
11 adventurous or any other adjective that sounds scary.
12 It's what you said about the trip yourself and whether
13 you, in fact, met the criteria of success of getting
14 there with your boat and load intact.

15 So were these historical accounts successful?
16 Yeah. There were no deaths. There were no injuries,
17 and all but one boat reached its destination.

18 So my conclusion is dominantly the historical
19 boating accounts are accounts of successful boating.

20 On the Gila River, what kinds of -- types of
21 boating were they doing? What kind of trade and travel
22 were they doing? We have accounts of people hauling
23 goods, carrying passengers, doing exploration, military
24 use, ferries, fishing, trapping, hunting, survey, and
25 travel; and the boats that they were done in,

1 dominantly, as I said earlier, in small, low draft boats
2 dominantly in the downstream direction.

3 These are the segments in which these
4 historical accounts occurred, most of them in Segment 8.
5 But some kind of account in every segment.

6 Time of year, it wasn't done just during
7 unusual flooding. It was done seasonally. We don't
8 have particular accounts from August, September. Don't
9 know why. But those are typically higher flow months.
10 We have accounts from the winter. We have accounts from
11 the spring. We have accounts from the fall. We have
12 accounts from June, which would be the seasonal low
13 water.

14 These boating accounts occurred on normal flow
15 ranges, not during floods. They're within expected
16 range time period. They also account some difficulties
17 with some manmade obstacles, such as depleted flows and
18 irrigation diversions. And again, all but one reached
19 its destination.

20 So that's our historical boating accounts. We
21 can move to the geology right now.

22 BY MR. KATZ:

23 Q. And before you do, just for the record, I
24 didn't interrupt you on purpose, but slides 99 through
25 126 for future reference are the slides that deal with

1 historical boating.

2 A. That is correct.

3 I'm at slide 127 now. The geology is variable
4 over the river's length. This is quite a stretch of
5 Arizona, and it's not unexpected that the geology would
6 change.

7 Another finding, a key finding from the
8 geology reports in our, in our submitted reports are
9 that the channels move but essentially they stay the
10 same. So this low flow boatable channel doesn't change
11 much except perhaps in location. But also remember,
12 floods aren't ordinary.

13 I also discussed previously whether the
14 channels are braided, compound. I would suggest that
15 the flood channels have some braiding character to them
16 but the boating channel generally does not. And also
17 braided or not, you can boat a braided channel if
18 there's enough water.

19 This graphic right here depicts the
20 variabilities of the geology. The grays are bedrock.
21 The gray tones are bedrock. The yellow is alluvium or
22 soils. So you can see the change in geology as you move
23 across the state from a narrow alluvial valley to
24 bedrock, alluvial valley, bedrock, and then dominantly
25 alluvial valley down to the Colorado.

1 Dr. Gary Huckleberry wrote the geology section
2 of the lower Gila report, the Land Department's original
3 report that discusses the changes in the geology of
4 Segments 3 through 8. That's from Safford on
5 downstream.

6 He also makes reference to the Burkham study,
7 and notes that it was due to a period of unusual
8 flooding. Having said that, he also describes the
9 Kearny Reach as having a single sinuous channel. And he
10 also notes that his work did not cover the canyon
11 reaches of the Gila River, that he's only looking at the
12 valley reaches.

13 He also notes this depiction, this change,
14 this difference between the low flow, the main channel,
15 and the higher flow braided channel. It's also in
16 Huckleberry's work.

17 He also makes the statement that the GLO
18 channel plots -- so the surveyors as they were doing
19 their boundary surveys occasionally would draw a sketch
20 of what they thought the channel looked like between
21 section lines. And in his experience in doing a lot of
22 channel location work is that those plots are
23 notoriously inaccurate except at the section lines. So
24 to look at this for evidence of channel patterns is not
25 using the best source.

1 Also, having worked with Gary on a number of
2 occasions, we are both by training flood
3 geomorphologists and tend to be thinking more about
4 flood patterns and the river corridor in general than
5 the low flow main channel that we're interested in for
6 navigability; nor was Gary at that time doing those
7 reports focused in on determining the ordinary and
8 natural condition of the river. We were looking at
9 conditions as of statehood without consideration
10 explicitly of the changes due to human impacts.

11 In those geologic reports on slide 130, you
12 can see that there is a geomorphic response to those
13 human changes to the river. Specifically, the loss of
14 the low flows. When we take out the flows for
15 irrigation, for storage and dams, et cetera, it affects
16 the ability of that navigable low flow channel to
17 recover. So it takes longer for it to recover. So the
18 patterns we see today in post-flood, et cetera, it takes
19 longer for a pre-flood condition to be re-established
20 with respect to that flood channel.

21 The persistence of flood impacts that we see
22 today are not as representative as what would occur if
23 the river were in its ordinary and natural condition and
24 the low flows were still there.

25 Also, the change, the absence of low flows,

1 the absence of floods affects the ability of native
2 species to compete with nonnatural species, and we see
3 the invasive species outcompeting along the river
4 segments where the flood cycle has been interrupted.

5 And also with the loss of the low flow we have
6 changes in the sediment budgets of these rivers, and
7 that has impacts for how the channel looks today in
8 terms of braiding and increased deposition of sediment
9 along the river corridors.

10 Some of the other factors from the geology;
11 one, there are no waterfalls. Rapids are rare on the
12 Gila River.

13 The Gila River is what's called an exotic
14 stream. That means its source is not proximal to the
15 river itself. It's being basically run off from the
16 Gila uplands in New Mexico and other distant sources as
17 it traverses the desert sections of Arizona.

18 Water table previously was high, which changes
19 how the river is being attributed from the groundwater
20 flow in that there are gaining and there are losing
21 segments, and I've listed those by segment here.
22 Basically, the bedrock canyons, the stream is gaining,
23 and in the other segments the stream is losing.

24 And sandbars, geologically, lots of navigable
25 rivers have sandbars. We've talked about that already.

1 Some of them do exist on the Gila River, but again,
2 those are just obstacles to go around.

3 I'm ready to begin the section on hydrology,
4 if you would like to go on now or --

5 CHAIRMAN NOBLE: Let's go on.

6 THE WITNESS: All right.

7 BY MR. KATZ:

8 Q. And the sections that dealt with geology, just
9 for the record, were slides 127 through 133?

10 A. Correct. 131.

11 Q. 131.

12 A. Yes.

13 So we're at 132 right now. We're going to
14 present the key findings from our hydrology in the Land
15 Department reports. In the original reports we provided
16 a lot of data in a lot of different formats. We
17 provided data from pre-statehood conditions, whatever
18 measurements were available at statehood, year of 1912,
19 post-statehood, long-term records. We presented the
20 means, the monthly averages, the median flow rates, the
21 ranges of flow, the 90 percent discharge, the 10 percent
22 discharge. We provided information on the seasonality
23 of flow. We provided information on floods and
24 droughts -- those are rare -- and they're not part of
25 the ordinary condition of the river.

1 We provided estimates from -- based on U.S.
2 Geological Survey and Bureau of Reclamation -- the
3 Reclamation Service, excuse me. Flow measurements, but
4 also from other sources, from tree ring data, from other
5 studies, from other modeling type studies, but we had a
6 heavy reliance on the modern U.S. Geological Survey Gage
7 Data from the late '80s to the present. We described
8 that this morning.

9 We've provided both mean and the median. Both
10 were provided. The mean is commonly used. It's more
11 commonly used as a means of communication between folks.

12 The median, as I noted in those original
13 reports long ago, is more reflective of the ordinary
14 condition, and that's why we provided those data sets in
15 those reports.

16 There is seasonal variation. I showed you
17 that generalized curve with winter increases and monsoon
18 summer increases. Summer monsoon increases the flow.
19 Those kinds of variations are normal for navigable
20 rivers. Some rivers have fluctuations that relate to
21 freezing in the winter. Some have different flood
22 seasons later in the year, early in the year. Seasonal
23 fluctuations are a normal part, and those are
24 represented in the data that you've been seeing many
25 times previously.

1 There are floods. There are droughts. Those
2 are rare things. That's why we call them out. That's
3 why they make the news. They're not ordinary. They're
4 unusual. Newsworthy. But they're irrelevant to the
5 determination of navigability. They are not the
6 ordinary and natural condition.

7 VICE CHAIRMAN HENNESS: How do you define
8 "drought," Jon?

9 THE WITNESS: There is a scientific definition
10 of drought which is a certain number of years of below
11 average, a certain amount of below average flow -- that
12 is in the record somewhere. Perhaps one of the experts
13 here can rattle that off from memory. I'm going to use
14 the common sense definition of drought.

15 VICE CHAIRMAN HENNESS: But you say it's not
16 common, it's not ordinary?

17 THE WITNESS: No. I would agree that it's not
18 ordinary. And that's why we call it a drought. It's
19 something unusual that's happening. If the river is
20 hardly ever flowing, I would say that's its normal
21 condition, not drought. Drought has to be below some
22 threshold of normal from a common sense standpoint.

23 And generally you know when you're in a
24 drought after the fact. You look back at the data and
25 say oh, the data indicates that we were in a drought.

1 You might have the sense that it's dry, but whether it
2 meets that scientific definition is something you
3 determine after the fact.

4 VICE CHAIRMAN HENNESS: Some of us deal more
5 with those things -- recognize it a little earlier than
6 some of you technicians.

7 THE WITNESS: I suppose the price of water
8 might change, depending on where it's coming from.

9 The flow data we cited are perfectly reliable.
10 They were the best available data at the time. They
11 still are the best available data that describe
12 long-term flow records. They're based on actual
13 measurements. They're routinely used for court
14 decisions. They're relied on for water supply
15 decisions, water rights, permitting recreational
16 boating, all sorts of other uses. The gage data
17 provided, the flow data are reliable, sound, scientific
18 information.

19 BY MR. KATZ:

20 Q. And again, gage data, as you described
21 earlier, underestimates historic flows; is that correct?

22 A. That's correct. So to underscore what I said
23 earlier, the numbers that we're using are lower than the
24 ordinary and natural conditions of the river. So the
25 river flows are less. That means the depths are less.

1 But we can show that you can boat in the conditions of
2 the flow rates that are based on the flow data that we
3 used. It's only going to be more navigable, greater
4 depths, et cetera, by using flow data that represent
5 ordinary and natural conditions.

6 It would have been great to have the budget
7 and the time to go back and do such studies, but there
8 have been other folks who have done those studies, and
9 we're willing to concede the results that are presented
10 in some of those studies.

11 These are a summary of the data that were
12 published previously by the Land Department for the Gila
13 River. And in this chart here you see various gauging
14 stations from Dome up to Virden in the segments that
15 they go with.

16 The second column, the median flow rate, if it
17 were available, the 90 percent flow rate. In this case
18 I mean it's greater than this flow rate 90 percent of
19 the time. Again, remember, this is post-disturbance,
20 and the kind of depletion hydrology that has occurred
21 since the ordinary and natural condition prevailed has
22 been most impacted on this flow rate right here.

23 And then the last column you see the period of
24 record. Again, you see that those are relatively far on
25 past the period when the rivers were in their ordinary

1 and natural condition.

2 Other parties are submitting estimates of the
3 undepleted flow rate. Mr. Burtell's estimates are here
4 for Segments 1, 2, 3, and 4. You can see his numbers
5 here from 80 -- these are by month and they're medians.
6 From his report you can see these flow rates are
7 typically three-digit type numbers ranging from a low,
8 monthly low of about 80 CFS, cubic feet per second, up
9 near the New Mexico border down to below Coolidge Dam to
10 a high monthly of about 845 CFS. A high monthly, even
11 up at Virden, is around 315.

12 Mr. Burtell did not provide estimates in
13 Segments 5 to 8 that I saw in his report. They may be
14 in other work that he's done.

15 Mr. Gookin provided information predominantly
16 for Segment 6, my Segment 6 and 7, a little bit into 5,
17 and he proposes a median flow rate in the neighborhood
18 of 345 down to 193 above the Salt River and then up to
19 774 with low flow rates that you see over there in the
20 far right, and mean flow rates that he reported over
21 there.

22 Q. Before you go on, when we look at the
23 reconstruction that Mr. Burtell did for Segments 1
24 through 4, are all of those flow ranges within those
25 segments that would be boatable?

1 A. Yes.

2 Q. And with respect to the range of flows that
3 Mr. Gookin reports at slide 138 for Segments 6 and 7 --
4 or 5, 6, and 7, would those be boatable?

5 A. Would you repeat the question?

6 Q. Yeah. I was asking the later data that you
7 referred to that the flow rates that were presented by
8 Mr. Gookin, I believe on slide 138, at least that was my
9 understanding of what you were saying for Segments 5, 6,
10 and 7, would those be flow rates that would create
11 depths significant enough to boat?

12 A. Yes.

13 Q. And again, we are more concerned from a
14 navigability or boating perspective with the depth of
15 the water, not cubic feet per second in ordinary
16 condition?

17 A. That is correct.

18 Q. Please go ahead.

19 A. The rubber meets the road at the depth.

20 As far as I'm aware, Dr. Mussetter did not
21 produce any flow data for whatever reason.

22 Win Hjalmarson, working primarily in Segment 7
23 and 8, produced these estimates from his previous work,
24 median flow of 1,750 and a base flow of 290 up at the
25 confluence with the Salt River down to 170 CFS near the

1 mouth of the Gila at the Colorado River.

2 And I'm sure these gentlemen will be speaking
3 to some degree later in this week, and if I've made some
4 estimates there they can -- if I've made some errors
5 there, they can correct those.

6 There are other estimates of undepleted flow
7 rates that have been out there. The Bureau of Rec has
8 made some, other publications, and they are uniformly
9 larger than the flow data that we are using here.

10 Some of those are from tree ring studies; some
11 of those are from other types of modeling studies. But
12 again, they're all higher than the flow rates and the
13 information that I'm building my case on.

14 So we used the best available data. The flow
15 is predictable. Those data show us that. It's within a
16 specified range 90 percent of the time. The flow is
17 reliable. It's perennial, and it's significant. And
18 pre-development flows were higher. That's really all
19 you need to take from this portion of the presentation.

20 Now we move to the rating curves.

21 CHAIRMAN NOBLE: We'll take a break after your
22 curves.

23 THE WITNESS: All right.

24 BY MR. KATZ:

25 Q. And again, your hydrology summary was slide

1 132 through 140, correct?

2 A. Correct.

3 Now I'm at slide 142. And we'll talk about
4 these rating curves, and that would be a great place to
5 take a break right after, and then we'll dive into some
6 specific segments and how they apply.

7 So the rating curves were used to develop
8 estimates of flow depth and width. We based them on,
9 partially on rating curves that were used by the U.S.
10 Geological Survey -- a number other experts took the
11 same approach -- as well as field sections. We tried to
12 make those data sets representative of each of the
13 segments, so rather than having one curve that applied
14 uniformly to the entire river, we have one or two curves
15 that applies to each segment as we define them.

16 They are also based on actual measurements and
17 observations of flow depths and widths, and we wanted to
18 check and make sure that our results with the historical
19 descriptions are consistent with historical descriptions
20 that I talked about earlier. So that was kind of our
21 reality check. It's one thing to run the math and get a
22 number. It's quite another to go back and say, yeah,
23 that makes sense with what we see in the field and what
24 other folks described as having seen when they saw the
25 river previously.

1 What I'm giving you here in these tables are
2 by segment the depth estimates for three flow rates.
3 One is the median flow rate, which I would suggest to be
4 the most representative conditions. Half the time the
5 flow is higher than that; half the time it's less. The
6 90 percent flow, which would be something akin to base
7 flow. A low flow rate, again, for the depleted
8 condition. And then also just for comparison, the mean
9 annual flow rate, which is the number that we've given
10 you in the past. The number I want you to focus on are
11 these depths right here. So for the Segment 1 at the
12 upstream end, we're looking at depths that are in the
13 neighborhood of a little greater than a half foot at the
14 base flow condition. And at the median, they're in the
15 neighborhood of about a foot. This is the upstream end
16 of Segment 1. This is near the downstream end of
17 Segment 1.

18 Q. Is there any difficulty in floating a canoe or
19 boating a canoe down waters of that depth?

20 A. According to the U.S. Fish and Wildlife
21 Service and the data I presented this morning, a half
22 foot depth is the minimum for canoeing.

23 Q. So .9 or 1.2 feet are above that?

24 A. No problem.

25 Q. And they may not be ideal conditions, but they

1 are boatable conditions?

2 A. That's correct. It's more fun to boat when
3 there's greater depths. It's plenty boatable at these
4 depths shown here.

5 Segment 2, about the same. A little more than
6 a half foot at the base flow, the depleted base flow
7 condition, and at the depleted median condition, about a
8 foot deep. And again, as I mentioned earlier this
9 morning, when you have enough depth, you almost always
10 have enough width.

11 Q. And these curves are depleted conditions and
12 are not natural conditions prior to significant damming
13 and diversion?

14 A. That is correct.

15 Segment 3, near Solomon. Keep in mind, this
16 is a very depleted river section right here. 2 CFS.
17 That's irrigation that takes out almost all of the river
18 flow in this segment right here. So we see they are a
19 little below those thresholds in this depleted
20 condition. But here at the head of the river of the
21 valley in Segment 3, depths are sufficient for shallow
22 draft boating.

23 Segment 4, we don't have the data. We did not
24 have the data for this segment. We're going to come at
25 it from a different direction. It was not reported in

1 the original Land Department reports, and that's what
2 I'm reporting here, what was in the original land
3 reports. We've gone a separate way of coming up with a
4 rating curve for this section which I'll show in a bit.

5 But at the mean annual hydraulic depth -- it's
6 the average depth, not the maximum depth -- was a little
7 under three feet.

8 Near Kelvin in Segment 5 using the rating
9 curves in that area, again, this depleted condition,
10 about a third of a foot at 26 CFS, but the median flow
11 around 270, over a foot in depth.

12 Also from the Land Department report, at
13 Olberg in Segment 6, again, depths that -- they provided
14 a rating curve, and you can see that even at their
15 lowest condition, the depths are pretty uniformly above
16 a half foot.

17 Same for Segment 7, a rating curve provided by
18 the Land Department, half foot or greater as the flow
19 rate goes up. Think of these values in the context of
20 the undepleted flows that were reported by the other
21 experts in this case -- we're going to hear about
22 later -- that are in this range right here, and those
23 depths are a foot and a half to three foot, in that
24 range.

25 The lower end of Segment 7, again, flow rates

1 greater than a foot, and Segment 8, we have very little
2 data that was in the Land Department report, but at the
3 mean annual flow, a depth of about three feet.
4 Comparing these rating curves that were in the Land
5 Department reports and the upper Gila report, you can
6 see that in general depths that were reported by others
7 are greater than the depths that are reported by the
8 Land Department. That's consistent with what I've been
9 telling you. The flow rates are greater in the
10 undepleted condition; therefore, you would expect that
11 the depths would go up as well. Similarly, with the
12 results for Section 6, Mr. Gookin, there's substantial
13 issues with the cross section there that we can get
14 into, if needed. Those depths seem to be a little bit
15 low, but still in that boatable range.

16 And in the Hjalmarson data, again, you've seen
17 in the previous testimony, these are depths that I would
18 concur with. They seem realistic based on the
19 methodology that he used, based on the observations that
20 we read in the historical record, based on the
21 principles of river geomorphology, et cetera. These are
22 very reasonable estimates and what I would think would
23 be representative of section -- Segment 7 and 8.

24 This is a good place to take a break.

25 CHAIRMAN NOBLE: I think this is the time to

1 take a break. Take a break for about five or ten
2 minutes. Just be a short break.

3 (Recessed from 3:37 p.m. to 3:48 p.m.)

4 CHAIRMAN NOBLE: Mr. Fuller.

5 THE WITNESS: All right. Welcome back. Thank
6 you.

7 This is the part where we start stitching
8 together all of the little pieces of information that
9 I've been laying out for you all day. Taking the
10 hydrology estimates, taking the rating curves, taking
11 the descriptions and piecing them together and saying
12 what kind of boating are these segments susceptible to.

13 The requirements for boating by different boat
14 type, I gave you in the boating presentation. The flow
15 data, I gave you seasonally and medians and the 10 and
16 the 90 percent range. And what we're doing now is
17 putting that together by segment.

18 And I'll give your brain a moment to absorb
19 this chart right here. We prepared this kind of chart
20 for each of the 8 segments, the graphics of the segments
21 Joy is putting up behind us.

22 So Segment 1, again, is from the New Mexico
23 border down to the beginning of the Box, this area right
24 here. What you see on this chart right here is all this
25 information put together. So on the vertical axis we

1 have flow rates ranging from 0 CFS to 2,000 cubic feet
2 per second. Along the horizontal axis is each of the
3 months. 156 is the page number.

4 The other lines on this chart include the
5 average monthly flow taken from the gage data, the
6 modern gage data for Segment 1, that came from the gage
7 near Virden, which is the upstream end, and you can see
8 that seasonal fluctuation highs around March, lows in
9 June, and the monsoon push in late summer, early fall.

10 That's this darkest line with the mountains in
11 it. The red dashed line right here is the 10 percent
12 flow rate. So -- I think this is actually backwards --
13 10 percent, 90 percent. But 90 percent of the time it's
14 less than this. 10 percent it's greater than that. So
15 404 CFS. The base lower than 90 percent flow rate is 21
16 CFS. So for the modern gage data, Segment 1, 80 percent
17 of the time is between 21 and 404 CFS. That monthly
18 flow fluctuation fits within that bracket between the 10
19 percent and the 90 percent. The 50 percent range, the
20 50 percent median flow is 91 CFS.

21 We took the rating curves and looked at the
22 flow depths generated by those flow rates and said,
23 well, what kind of a boat can you put in there according
24 to the federal criteria. So at 21 CFS we've got at
25 least a half foot of flow, so we can put in canoes,

1 kayaks, other low draft boats like that. And that
2 represents the blue range right here.

3 The purple is depths that are too low for even
4 canoes. So below 21 CFS with a 90 percent flow rate,
5 somewhere in that range is the depth that generates less
6 than a half foot. So purple, no boat. Blue, canoes and
7 kayaks. Above that is canoes, kayaks, flatboats, lots
8 of different boats, because the depths are sufficient
9 for those types of boats.

10 Off the chart up here, somewhere up here is
11 the two-year flood, so these are nonflood discharges.
12 Clearly, we can -- the upper boating limit is well above
13 2,000 CFS, but that's well outside our ordinary
14 fluctuation. So the ordinary and natural fluctuation of
15 flow on this river is between here, and 80 percent of
16 the time we can put a boat on there.

17 BY MR. KATZ:

18 Q. And a two-year flood is off the chart or above
19 2,000 CFS, but a 100-year or a 500-year flood would be
20 way off that chart?

21 A. Well beyond our vertical axis.

22 Q. And again, the best reflection of ordinary and
23 natural condition on all of these illustrations is the
24 91 CFS, but the base or low flow, 90 percent of the time
25 is 21 CFS or higher?

1 A. In the depleted condition. So to get at the
2 ordinary and natural condition, I also added this dashed
3 line on right here where you see that seasonal
4 fluctuation, and this comes from the reconstructed
5 median monthly flow from Mr. Burtell. He was the one
6 that provided monthly fluctuations. So I added those
7 data set, that data set onto this curve, and you can see
8 there, as I mentioned, they're well above the median
9 flow. They're also above the average monthly flows --
10 and these are medians, keep in mind.

11 Q. So again, the 21 CFS to the 404 CFS is
12 reflective of diminished or depleted flow rather than
13 ordinary and natural flow?

14 A. Right.

15 Q. Thank you.

16 A. So, I want to show you a chart like this for
17 each of the 8 segments, and they're going to look
18 dominantly with the same kinds of information and the
19 types of boats. The purple, blue, green; 90 percent, 50
20 percent, 10 percent.

21 In Segment 1, what kind of modern boating goes
22 on. It's rarely boated, primarily because it's not very
23 scenic. There's some nice trees and whatnot. But also
24 because a lot of the flow has been removed. There's a
25 number of diversions. There's fences. Not particularly

1 adventurous. If you're going to drive that far to go
2 boating, you might as well go to the Gila Box. It's
3 prettier, and it's a long ways from any major population
4 centers. If that segment were located in downtown
5 Phoenix, you would see a lot more boats on it on a daily
6 basis.

7 Since statehood, one of the other things that
8 the Supreme Court wanted us to look at in the Montana
9 case, what kind of changes have occurred. Well, the
10 flow has been removed for irrigation. There's been a
11 fair degree of encroachment of the valley bottom, mostly
12 for agriculture. There are some isolated levies in and
13 around there. There are a number of bridges, and we've
14 had invasion by some tamarisk and loss of some of the
15 native vegetation. Primarily it's the loss of the low
16 flow and that recovery of the main channel has been
17 changed.

18 By way of summary, you can boat this segment
19 about 90 percent of the time or about 329 days a year by
20 canoes. A little less by flatboats. You're going to be
21 doing that seasonally, predictably during the spring
22 high flow period. Some recreational use up there, and
23 in the ordinary and natural condition, it would have
24 been higher flow and more boatable.

25 So if you've been working in this for 22 years

1 and you've seen a lot of rating curves and you've seen a
2 lot of smart people argue about flow rates and depths,
3 and blah, blah, blah, blah, blah, what kind of boats.
4 It occurred to me that maybe the best test, we go take
5 my boat out there and throw it in the river and see what
6 I could do. What's it going to look like?

7 I went out there in February of this year, and
8 the flow rate at Duncan was 50 CFS at the upstream end.
9 At the Old Safford Bridge out to the Box, it was 38 CFS.
10 So I went out there in one of my solo canoes. It's a
11 little under 16 feet long. It weighs 59 pounds. The
12 load I carried was about 300 pounds, including me -- I
13 won't tell you how much of that was me -- and I have
14 some pictures.

15 Q. And what would be the maximum load of that
16 particular boat?

17 A. You probably wouldn't want to take more than
18 500 pounds in that particular design.

19 Q. Whether you're talking 300 or 500 pounds, it
20 wouldn't make a significant difference in its ability to
21 be navigated through this section or these sections of
22 the Gila?

23 A. It might change the seasonality of it at that
24 particular boat. It's going to draw a little bit more
25 water with -- when I get in the boat, I'm down about

1 3 inches. When I put 500 hundred pounds in the boat,
2 it's down about 7 inches.

3 VICE CHAIRMAN HENNESS: Jon, let me ask you a
4 question. I just made the drive from Silver down to
5 Cliff, that way.

6 THE WITNESS: Silver City to Clifton, did you
7 say?

8 VICE CHAIRMAN HENNESS: Down by Cliff, New
9 Mexico --

10 THE WITNESS: Okay.

11 VICE CHAIRMAN HENNESS: Along the river, the
12 Gila, there wasn't a damn bit of water in it. Now, you
13 talk about all these footages and what have you. How do
14 you explain these footages when there was no water in
15 the channel at all?

16 THE WITNESS: Well, we could go -- I boated
17 the Gila Box at 22 CFS.

18 VICE CHAIRMAN HENNESS: Where did that water
19 come from?

20 THE WITNESS: God. Rain, springs, runoff.
21 It's more like where did the water go. So when it's not
22 in the riverbed, it's been taken out or it's unusual
23 drought.

24 VICE CHAIRMAN HENNESS: That was one of the
25 things I noticed more than anything driving along, there

1 was nothing there. I don't know how you canoe something
2 like that.

3 THE WITNESS: This is 50 CFS. This is what
4 the river looks like.

5 VICE CHAIRMAN HENNESS: Not when I was on it
6 two months ago.

7 THE WITNESS: According to the USGS, this is
8 50 CFS. This is the camera. You can see the date and
9 the time. This is me sitting in my boat. This is what
10 the river looks like.

11 I paddled from the -- above the Church Street
12 Bridge in Duncan. I took out about two and a half,
13 three miles downstream. I went over and had some
14 breakfast. Loaded up my boat. I took it down to York,
15 put it back in the river and boated down to the Old
16 Safford Bridge. That's 191.

17 VICE CHAIRMAN HENNESS: Maybe I was on the
18 wrong river.

19 BY MR. KATZ:

20 Q. And I guess, Mr. Fuller, the things that we
21 see today, even though you're seeing this condition
22 here, are again substantially depleted since the 1860s
23 or '70s?

24 A. They are substantially depleted. If we look
25 back at our curve here, we look at the undepleted flow

1 data, we can see it's significantly above what I would
2 have experienced. So I was boating at 50 CFS down here.
3 Normally in February, you would expect that flow to be
4 up around 300 CFS. We are in a drought. The Gila
5 highlands did not get much water this last -- not much
6 snow this last year.

7 That was Segment 2 -- that was Segment 1.
8 Segment 2 is the Gila Box. The same data. You see that
9 seasonal fluctuation, high flow in the winter, in
10 monsoon. Our 90 percent flow rate is 18 CFS. Our
11 median is 80 CFS. There is the reach right there. We
12 have marked out in large green numbers the rapids that
13 occur in this reach and also the type of rapids that
14 they are. They're Class IIs. There's four of them in
15 this reach. We can see the reconstructed median monthly
16 flow from Mr. Burtell. Quite a bit higher than the
17 modern gage record through this reach. And again,
18 seeing that floating by canoes and kayaks down to 18
19 CFS.

20 And this reach is, indeed, boated a lot very
21 frequently by canoes, kayaks, rafts. There has in the
22 past been a fair amount of commercial recreation in that
23 area, people paying to go down that river in somebody
24 else's boats. There are four Class II rapids. The
25 rapids themselves make up less than one percent of the

1 23-mile reach. There's a book about boating through
2 here by M.H. Salmon -- I'm forgetting his nickname --
3 Dutch. Dutch Salmon. There's a bunch of websites and
4 river guides. The prime season is in late spring and in
5 the summer monsoon. And according to our data that I
6 showed you on the chart there, it's boatable by canoes
7 90 percent of the time. By flatboats, about 50 percent
8 of time. There's number of days per year. Extensive
9 recreational use, and there are some fences and
10 diversion dams in the reach that alter the flow
11 conditions. Again, ordinary and natural condition would
12 be more boatable than today. And again --

13 Q. And again, we're dealing now with substantial
14 diversion and damming that has affected -- or is it
15 primarily diversion with respect to the depleted
16 conditions on Segment 2?

17 A. At this time it's diversions.

18 Q. And just for the record, the Segment 1
19 summaries were slides 156 through 159 and we're dealing
20 now with Segment 2, slides 160 to 163.

21 We also put up in a large version of the map
22 of Segment 2 that we will be offering, or at least a
23 smaller version of that map.

24 A. Yes. And again, wanting to see what it looked
25 like at low flow, I went out there last week, week

1 before last. In June it was 22 CFS at the Old Safford
2 Bridge. It was 40 CFS at the head of Safford Valley.
3 It was in the same canoe. I had a little heavier load
4 because I was carrying gear for camping, and I also had
5 company that brought along a Yukon Expedition kayak.
6 And this is what it looks like. Actually, I'm going to
7 turn this off and do that again.

8 Sorry, it was starting at the downstream --
9 which there it is again. All right. We're just going
10 to do that. Starting at the downstream direction
11 working our way up. Decent size river even at 22 CFS.

12 Q. And again, 22 CFS is below ordinary and
13 natural low flow?

14 A. It's below the -- it's well below the seasonal
15 low of the median monthly flow rates reconstructed.

16 Q. And again, you were in a 15-foot canoe. Could
17 you take a larger canoe or the same size canoe that
18 could carry a greater load?

19 A. Yeah, this particular canoe is developed for
20 speed in the downstream direction, so it's relatively
21 narrow. If I had a wider boat, it would draw less
22 water. If it were shorter, it would be a little more
23 maneuverable.

24 I'll show you lots and lots of pictures. This
25 is what that segment looks like at very low flow. It's

1 a typical little rapid. There's a little bit of beaver
2 sign.

3 VICE CHAIRMAN HENNESS: Where was this, Jon?

4 THE WITNESS: This is the Gila Box.

5 VICE CHAIRMAN HENNESS: The Gila Box, below
6 the --

7 THE WITNESS: It's above Safford, below
8 Duncan. That's probably enough of that.

9 Segment 3, below the Gila Box, down to
10 Coolidge Dam, San Carlos Reservoir, same kind of
11 information. 10 percent flow rate, 90 percent flow rate
12 in its depleted condition. Here's the reconstructed
13 monthly average flow. Again, there's the too shallow to
14 boat down to 62 CFS, according to the rating curve.
15 Based on my field experience, it might be a little bit
16 lower than that. Regardless, it's -- in ordinary and
17 natural condition wouldn't occur enough to worry about
18 the argument. But canoes, flatboats, et cetera, flow
19 rates above 62 CFS would occur most of the year. Hardly
20 anybody boats this reach because the flow has been
21 diverted. There are a number of fences out there.
22 Diversions. Scenery is relatively poor now. It's
23 mostly tamarisk. Long ways from population centers.
24 Not a lot of adventure.

25 Again, the changes since statehood, the flow

1 has been taken out. That's the biggest change. The
2 river has also been significantly encroached, mostly for
3 agriculture. There are a number of levies out there,
4 bridges, and particularly the invasive species of
5 tamarisk in the lower part of this segment. Boatable by
6 canoes and flatboats 80 to 90 percent of the time -- 80
7 to 90 percent of the time. Although there's not a lot
8 of recreational boating, mostly because of the condition
9 of the river these days. Ordinary and natural condition
10 would be much more boatable.

11 BY MR. KATZ:

12 Q. And again, we were dealing with slides 165,
13 166, and the map of Segment 3 has been displayed?

14 A. Yes. We are now on 167. Thank you for the
15 reminder. I'll update myself here.

16 Segment 4, this is below Coolidge Dam,
17 Needle's Eye Wilderness. Ms. Joy is showing you right
18 here. Here's the reservoir, goes through the canyon. I
19 gave you a flyover of that earlier. You can see that
20 there are a number of rapids, Class IIs. There's one
21 Class III in here. And I think reasonable people could
22 have an argument on whether that's really a Class II. I
23 showed you some video of boating through that. I think
24 there's a few Class II rapids in there. Nothing
25 particularly challenging in that reach at all.

1 On this chart, again, we see the same kind of
2 information. The median flow rate, 10 percent flow
3 rate, the 90 percent flow rate. The purple range, the
4 blue range, the green range meant everything they saw --
5 that previous -- we saw on the previous slide. But I've
6 also added in the average flow rate that was reported in
7 the Land Department's report. And the average monthly
8 flow rates as reconstructed from Mr. Burtell, and the
9 flow rates that were in the -- from the Kelvin gage as
10 well. So you can see those.

11 This is the modern, I'm sorry, this is the
12 modern flow data right here, and what you see right
13 there is the loss of the big hump in the winter and the
14 displacement of that flow to the summertime releasing it
15 for agriculture. The natural flow rate, the end of
16 season flow rate, you see it has that rise in the winter
17 as well as in the summer, and those rates are
18 substantially larger than the flow rates that we're
19 using in our chart.

20 VICE CHAIRMAN HENNESS: Is there a flow rate,
21 Jon, when there's no releases?

22 THE WITNESS: When there's no release? If the
23 powers-that-be cut off the water to that canyon,
24 whatever they need to release to keep the fish alive,
25 probably down, you know, 10 CFS, something like that.

1 I'm not sure of the lowest of the low releases. But at
2 very low releases only the --

3 VICE CHAIRMAN HENNESS: There's no, below the
4 dam, inflow particularly in that reach?

5 THE WITNESS: There's no other sources other
6 than what's coming down the Gila, if that's what you're
7 asking.

8 VICE CHAIRMAN HENNESS: If there's no releases
9 from the dam --

10 THE WITNESS: It dries up with the exception
11 of some minor springs. However, even in that case
12 there's a number of -- most of the river is pools. So
13 until those pools evaporate and there's no inflow
14 from the surface, there would be water in the river, but
15 the riffles would be -- you would need to drag through
16 the riffles and the rapids if there was no inflow.

17 Okay. So summarizing Segment 4. All right?
18 Modern boating. It's tough to get in there, because the
19 roads are often locked, with locked gates. But it's a
20 beautiful canyon. If you can find a way in, it's a
21 beautiful run, and a lot of people will hike themselves
22 in. I've known people that have hiked up from the
23 bottom dragging a boat, then boated on down just because
24 of the fun in doing it.

25 There are twelve Class II rapids, one Class

1 III in the 21-mile reach, and there are a number of
2 websites that describe the boating conditions in there.
3 So it is a modern boating reach.

4 Since statehood, the flow releases I mentioned
5 are regulated for irrigation, and there's a fair amount
6 of tamarisk invasive species, particularly in the lower
7 part of the canyon, and the bank vegetation is quite
8 overgrown due to the cutting off of the floods.

9 VICE CHAIRMAN HENNESS: They tell me that it's
10 pretty good agriculture going on in the bottom of that
11 canyon.

12 THE WITNESS: Really? I did not see that. I
13 know there's plenty of cows down there.

14 VICE CHAIRMAN HENNESS: It's some of that
15 funny weed.

16 THE WITNESS: I'm glad I didn't run into
17 anybody doing that.

18 VICE CHAIRMAN HENNESS: I wonder if they
19 divert water for it.

20 THE WITNESS: I couldn't tell you. Not my
21 expertise.

22 The summary for Section 4. Boatable by canoes
23 90 percent of the time. Flatboats, little more than 70
24 percent of the time. Even more so in the ordinary and
25 natural condition. And there is recreational use.

1 Again, I wanted to have that test. I took my
2 boat out and a number of other boats, boated Segment 4
3 into Segment 5, and this is what it looks like.

4 BY MR. KATZ:

5 Q. What was that time of year?

6 A. This was in --

7 Q. February?

8 A. -- February, February 21st, I believe this
9 was.

10 VICE CHAIRMAN HENNESS: Of this year?

11 THE WITNESS: This year, 2014.

12 And the flow rate was 220 CFS. I noticed
13 there happened to be a release, so we decided to jump on
14 it, get out there and boat it.

15 VICE CHAIRMAN HENNESS: We had the one flood
16 come out of that, picked up a 120,000 acre feet in the
17 dam.

18 THE WITNESS: They had some flow back there to
19 get rid of.

20 Good-sized river. Interestingly, somebody
21 else has a boat down there. See that right there.
22 That's a rowboat that some rancher stores on the shore.
23 For what purpose, probably fishing. It's a long ways in
24 at that point. The boats that were out there were a
25 tandem canoe. A Wenonah Cascade is 15 feet long. We

1 were carrying a little under 500 pounds, I would guess,
2 450 maybe. We had a hard-shell kayak Prijon, an
3 inflatable kayak, and another tandem canoe being paddled
4 by Don Farmer and his wife Kiki -- who I think you'll
5 hear from tomorrow.

6 MS. HERNBRODE: Wednesday.

7 The WITNESS: Wednesday.

8 CHAIRMAN NOBLE: Of which week? You're doing
9 fine, Mr. Fuller. I didn't want to hurry you up at all.

10 THE WITNESS: All right. This is what it
11 looks like. There you start getting into that narrow
12 near the Needle's Eye. Just takes you right down there.

13 This is the Needle's Eye. It's a narrow part
14 of the river. It's plenty wide enough for boats. This
15 is just a little alcove behind that rock. We sat and
16 waited for other boats to catch up.

17 I showed you some pictures of boating this
18 rapid earlier. And that's what it looks like in the
19 canyon below San Carlos. Very boatable. Those are the
20 boats we took down there.

21 Section 5 is the Winkelman reach. It goes
22 from about where State Route 77 comes close to the
23 river, around the bend over to Kelvin, and down through
24 the mountains down to Ashurst-Hayden Dam.

25 And here I'm only recording the seasonal

1 fluctuation that came from Mr. Burtell's reconstruction,
2 because of the change in the hydrology due to the dam.
3 It didn't seem useful to put that on there. Giving the
4 Land Department's average flow rate, the median flow
5 rate from the modern gage data, and then you see a
6 broader range; and the median monthlies fit in there.
7 And again, 90 percent of the time you can get lots of
8 boats in there, even in the depleted condition. But in
9 the historic condition, it would have been much more
10 boatable, greater depths, wider channels. A nice ride
11 through there. We saw that in the historic accounts as
12 well.

13 Segment 5, there's occasional recreational
14 boating, mostly canoes and kayaks. Flow has been
15 removed. There's a number of diversions, fences, mining
16 waste. Limits some of the recreational boating.
17 There's one Class II rapid in that section. In this
18 61-mile reach the rest of it is Class Is or pools. Very
19 easy to boat. If you like birds, it's a fantastic area
20 to see birds. Other wildlife. I saw the first mountain
21 lions I've ever seen in my life in this reach.

22 Changes since statehood, flow has been removed
23 for irrigation. Flow hydrology has been changed, a lot
24 of encroachment, mostly from mining. Extensive
25 invasion -- invasive species and loss of floods result

1 in a change of vegetation. So it's a little less
2 navigable today than it was in the past due to those
3 changes. Ninety percent of the time you can take a
4 canoe down there, same with the flatboats. And again,
5 there's some recreational use, mostly in small low draft
6 boats. And again, ordinary and natural condition. Much
7 more boatable than the data we're showing you in these
8 charts.

9 BY MR. KATZ:

10 Q. And just for the record, Segment 4 is
11 summarized at slides 167 to 171, and Segment 5, 172
12 through 176. Also the segment maps we keep putting up
13 are Exhibit X012, Exhibit 72 -- or part 72.

14 A. That is correct.

15 As you're talking, I'm flashing through some
16 field photos, what the river looks like today, and you
17 can see it's plenty wide enough, plenty deep enough,
18 lots of vegetation on the banks. A couple of spots that
19 are bare because of recent wildfires. A little bit
20 strainer. There's some strainers in spots. Nothing we
21 had to get out of the boat to get around. Just needed
22 to approach them cautiously. And that's what it looks
23 like. I'll show you lots more if you're interested.
24 And I'll be submitting these field photos on a DVD for
25 you at the conclusion of today's hearing.

1 Segment 6, downstream of Ashurst-Hayden down
2 to the Salt River confluence -- Ms. Joy is showing us
3 right here -- goes through the heavily agricultural
4 portion in Phoenix in the area of the Price Landing,
5 down to the Salt River confluence. And again, we're
6 looking at generalized -- this is a generalized monthly
7 flow average, and we don't have the seasonal data
8 downstream in this reach. Nobody has made estimates of
9 that.

10 We do have estimates of the median flow.
11 Mr. Gookin's in the range from 175 for his low flow. A
12 median of 345. In the Land Department report it's at
13 264 for median. So again, those pre-development
14 discharges were higher. The average discharge at 491
15 and 10 percent discharge up at 735. And again, those
16 are all boatable flow rates.

17 VICE CHAIRMAN HENNESS: Jon, this is from
18 where now, 6 -- 5 and 6? Where is this?

19 THE WITNESS: Ashurst-Hayden Dam downstream --

20 VICE CHAIRMAN HENNESS: The diversion dam?

21 THE WITNESS: Yep.

22 VICE CHAIRMAN HENNESS: Clear down through
23 Sacaton, across the bridge on the I-10, and you're
24 telling me that there's that kind of flow there?

25 THE WITNESS: In the ordinary and natural

1 condition.

2 VICE CHAIRMAN HENNESS: It's dryer than dry.

3 CHAIRMAN NOBLE: At statehood?

4 THE WITNESS: Absolutely.

5 VICE CHAIRMAN HENNESS: At statehood, you're
6 telling me?

7 THE WITNESS: Absolutely. Today you go out
8 there and it's like those German prisoners that broke
9 out of the prison camp; they saw the river on the map,
10 and it's a river no more.

11 BY MR. KATZ:

12 Q. And at statehood in its ordinary and natural
13 condition without the diversions that were taking place,
14 would it have been navigable?

15 A. It would not have been a dry river. It would
16 have been navigable by small boats. And at statehood it
17 was not in its ordinary and natural condition.

18 Q. And after 1923, that's when the Coolidge Dam
19 went into place, correct?

20 VICE CHAIRMAN HENNESS: Correct.

21 THE WITNESS: Not sure of the exact date, but
22 I have that in my presentation somewhere. Coolidge Dam
23 was about that time frame. Ashurst-Hayden, its modern
24 configuration was also about that time frame.

25 BY MR. KATZ:

1 Q. But at the time that dam went in, the water --
2 and prior to statehood, the water was overallocated and
3 not always available for agriculture because of the
4 diversions; would that be correct?

5 A. You know, I can't really speak to the
6 overallocations. I can tell you in its ordinary and
7 natural condition we have the flow estimates from a
8 variety of experts that suggest that the flow rates were
9 significant, and it was not a dry riverbed in its
10 median -- at the median flow rates.

11 Q. And as the result of damming and diversion,
12 we've turned what would have been a perennial stream
13 into basically extended desert?

14 A. Correct.

15 Q. And the cottonwoods that were reported earlier
16 in the historic reports and the willows that were within
17 the riparian corridor are no longer there?

18 A. Correct. And the fish.

19 Q. And without the trees in place, that subjects
20 the channel to greater than normal erosion, correct?

21 A. That's correct.

22 Nobody boats this because the river is now
23 dry. The water is out. So that's the primary change
24 since statehood. The flow has been removed. The water
25 table is lower, pumping. Lots of floodplain

1 encroachment. There's instream mining. There are
2 levees, bridges, invasive species. It's very strongly
3 less navigable than it was in the past. In its ordinary
4 and natural condition, it would have been boatable by
5 canoes 90 percent of the time as well as by flatboats.
6 There's no modern boating, as I mentioned.

7 Also note that in this reach, some of the
8 historical descriptions that I gave you earlier noted
9 that there were times when the river was dry. In one
10 case it was attributed to the river being -- water being
11 removed for irrigation. In other cases, that was not
12 stated as the reason. It is possible that there were
13 times that the river in this section either dried up,
14 became close to being dried up, particularly in the
15 lower reaches as you got closer to the Salt River but
16 still upstream of the Salt River. However, I would
17 suggest that based on these flow reconstructions and the
18 descriptions, that was not the ordinary condition of the
19 river. It may have been natural, but it was not the
20 ordinary distribution of flow. Typically the flow rates
21 were higher than that, thus says the record.

22 Q. And let me ask you. I am not here to ask you
23 legal opinions, but you have to have an understanding of
24 basic principles like Daniel Ball, and you also have
25 been briefed on and read PPL Montana?

1 A. Yes, I have.

2 Q. And does a river have to be navigable a
3 hundred percent of the time, year in and year out, or
4 boatable a hundred percent of the time, every month,
5 every year in order to be considered navigable?

6 A. My understanding is it does not.

7 Q. Thank you.

8 A. Segment 7, this is downstream of the Salt
9 River confluence, down to about Dome. The Salt River
10 provides a boost of flow. On this chart here we see the
11 generalized average monthly flow. We don't have the
12 reconstructed flow by month in this area, but we do have
13 the average flow. Mr. Hjalmarson's median base flow of
14 290, Mr. Gookin's median flow of 774, Mr. Hjalmarson's
15 median flow of 1,750. Regardless of which numbers you
16 believe, there's plenty of water there to float low
17 draft boats at those median flow rates whenever they
18 were there. So most of the time that river was
19 navigable, particularly by small boats.

20 Not a lot of boating goes on in here because
21 most of the water has been removed. There is some that
22 goes on in the effluent downstream of Phoenix where you
23 get into the runoff of the Salt and on to the Gila. In
24 the past there was a canoe festival or a river festival
25 that included canoe trips in that reach. So there was a

1 little bit of recreational boating. There's a
2 surprising amount -- when there's water and six million
3 people, you're going to find some people using boats,
4 and that's the case down in there.

5 Changes since statehood, actually the flow
6 removed for irrigation. There's plenty of encroachment.
7 Lots of levees, mining, agriculture, bridges, utilities,
8 invasive species. It's a very different river than it
9 once was and clearly less navigable than it was in the
10 past due to removal of flow.

11 Q. And let me just ask you. Human impacts have
12 affected both -- or Segment 6, 7, and 8 more than the
13 other segments of the river with respect to
14 navigability?

15 A. Yes. In its ordinary and natural condition, I
16 estimate that it was boatable by canoes at least 90
17 percent of the time. In flatboats, the same amount of
18 time, in the ordinary and natural conditions due to
19 higher flow were more boatable.

20 Also put some boats in here. We'll take a
21 look and see what that looks like. Segment 7, very
22 pretty segment.

23 CHAIRMAN NOBLE: Where is this?

24 THE WITNESS: This is on the Gila River
25 between the Buckeye area.

1 CHAIRMAN NOBLE: I got the Gila River part.

2 THE WITNESS: Pardon me?

3 CHAIRMAN NOBLE: I got the Gila River part.

4 MR. SPARKS: From the color, it's below the
5 99th Avenue Treatment Plant.

6 THE WITNESS: Yes, it is. It is in the
7 Buckeye area.

8 Beaver sign. Lots of water life. Other
9 people. It's a pretty segment. And the boater in me
10 longs for days when it was flowing more frequently. A
11 number of canoes on that trip, tandem canoes mostly.

12 CHAIRMAN NOBLE: Mr. Fuller, where did you get
13 out on that part?

14 THE WITNESS: We had some various dirt roads
15 that we got out on that are unnamed. Basically in that
16 trip we went down pretty close to the 85 Bridge is where
17 we got out. I've talked to other folks who have taken
18 trips, and they've gotten out closer to Gillespie.

19 CHAIRMAN NOBLE: You're not able to do it
20 below Gillespie?

21 THE WITNESS: You surely don't want to go
22 through Gillespie. Most of the water comes out at
23 Gillespie. I've never tried it down there below. I
24 have really no direct knowledge of modern boating
25 conditions. I've not talked to anybody who has boated

1 down there either.

2 Segment 8 is down Dome and below. The last
3 segment, and we broke this out because of the change in
4 the historical use, and the flow rates there are
5 basically the flow rates I've already summarized for you
6 that come from, primarily come from Mr. Hjalmarson. The
7 flow rates, his base flow is 170 CFS, and according to
8 the rating curves that he's developed and we've
9 developed and the Land Department had previously
10 developed, those are boatable by low draft boats, and at
11 higher flow rates are sufficient as the historical
12 record suggests for use by even larger boats, such as
13 steamboats.

14 BY MR. KATZ:

15 Q. Again, Segment 7, which we covered a few
16 minutes ago, is depicted or the summaries are in slide
17 181 through 185, and 186 through 189 deal with
18 Segment 8?

19 A. That's correct.

20 Not much modern boating goes on in Segment 8
21 because the water is gone, for the most part. Some
22 irrigation return flows. None that I'm aware of, at any
23 rate.

24 Changes since statehood are basically what
25 I've told you before for other reaches. The flow has

1 been taken out. We're drinking it and watering our
2 plants with it, and it's less navigable than in the
3 past. In its ordinary and natural condition, I would
4 estimate that at least 90 percent of the year it was
5 boatable by canoes, flatboats, and probably by
6 steamboats -- not streamboats -- 50 percent of the time.
7 And that the conditions were more boatable in the
8 ordinary and natural condition.

9 So getting close to wrapping up here, modern
10 boating on the Gila River. I kind of hinted at this a
11 little bit in our discussions. There's some
12 recreational boating that occurs in various segments.
13 In the past there has been some commercial recreation
14 that occurs. People that are taking people in boats
15 down the river.

16 Previously we provided evidence from the
17 Central Arizona Paddler's Club and a poll of their
18 members, and that all of Segments 1 and 2 have been
19 boated. Segments 4 and 5 have been boated. In fact, in
20 the past there was a river race in Winkelman on
21 Segment 5.

22 Also point you to previous testimony before
23 ANSAC in 1997 in the town of Globe, City of Globe,
24 regarding commercial uses on the Gila River.

25 There are websites that are devoted to

1 describing boating conditions on the Gila River in
2 Segments 1, 2, 4, and 5. In particular, the GORP site
3 says that year-round boating is possible in Segment 2
4 and recommends it as flow rate of 150 CFS to 1,500 CFS
5 for novice canoeists. So if you're new to the sport and
6 the river is at that flow rate, that's a pretty good run
7 for you.

8 And that 150 CFS -- it was curious to me, and
9 that was the reason for me going out there at 22 CFS and
10 saying well, if that's what they're recommending, how
11 low could I go. I probably could have gone lower than
12 the 22 that was out there. That's the days we were
13 there.

14 Paddleon.net describes trip reports from
15 Segments on 1, 2, 4, and 5. Southwestpaddler, and these
16 other websites that are listed there, including the
17 Bureau of Land Management, describe boating
18 opportunities on the Gila River.

19 Q. What are the reasons, or at least your
20 understanding of the reasons why we're looking at 1, 2,
21 4, and 5 but there isn't any reference to Segment 3?
22 What's the problem within that segment?

23 A. That's the agricultural reach in the Safford
24 Valley in which the water has been taken out of the
25 river.

1 Q. All right.

2 A. Arizona State Parks also publishes a boating
3 guide that includes descriptions of that segment of the
4 river. Canoes, kayaks, inflatable rafts, all boats that
5 were available at the time of statehood, albeit made of
6 different materials.

7 Also there's a published guide called the
8 Southwest Boating Guide that discusses the river
9 Segments 1 and 2.

10 Previously you heard from Jon Colby who owned
11 a company -- owns a company called Cimarron Adventures
12 and in the past for about 17 years he operated in the
13 Gila Box. These are commercial trips, primarily in the
14 spring. The flow rates he was trying to run were
15 between 170 and 3,000 CFS. In speaking with Jon, he's
16 indicated that he's just shifted his focus, shifted his
17 focus of his boating operations to other rivers at this
18 time. He still believes the river to be navigable,
19 which was his testimony before. Nothing about that has
20 changed. There are folks that have -- that offer
21 shuttles and outfitting and canoe rental in the past for
22 the Gila Box. My understanding from reading some of the
23 other experts' reports is that store is no longer doing
24 that. I take that on face value, but in the past they
25 have been.

1 Also in Segment 5, which is upstream,
2 primarily upstream of Winkelman, there have been
3 commercial outfits that operated there in the past that
4 ran rafting and inflatable kayak and canoe trips down
5 that reach. If you go out there on a Saturday when the
6 river is flowing, you'll see lots of people out there
7 boating.

8 Q. And you fairly recently spoke with Mr. Colby
9 just to reaffirm what he was or wasn't doing and his
10 prior testimony before this Commission?

11 A. I did. I did. I -- actually, Cheryl Doyle
12 did at my request.

13 Q. Was there any recollection, as far as you
14 know, of any conversations with any of the other experts
15 in these proceedings that he specifically recalls?

16 A. He said he didn't recall talking to anybody
17 about navigability specifically.

18 Q. Okay.

19 A. But he may have had a conversation.

20 Q. In other words, he may have had a
21 conversation, but there was no recollection of
22 discussing the navigability of segments of the Gila with
23 other experts in these proceedings?

24 A. Let me be clear. In Mr. Burtell's report he
25 discusses talking to Mr. Colby and reports what

1 Mr. Colby told him. In talking to Mr. Colby about that,
2 he doesn't recollect talking about navigability with
3 anybody. He didn't say that that conversation didn't
4 occur. But he didn't make the tie to is the river
5 navigable or not. He was talking about, does he operate
6 commercial operations there. So I have no doubt that
7 Mr. Burtell is honestly reporting the nature of his
8 conversation.

9 Q. That's fine.

10 A. No doubt at all.

11 Modern boating on the Gila River in the past,
12 according to the BLM, these are the companies here that
13 had commercial permits to operate in the Box. There
14 were quite a number of them. The data stopped at 2003.
15 That's when we last asked the BLM. I didn't ask for an
16 update on anybody more recently than that. This is the
17 data set that we provided previously. So there were a
18 number of companies that were out there running
19 commercial recreation trips.

20 Game and Fish goes down this reach and other
21 reaches in canoes doing wildlife surveys. That, in my
22 mind, is commercial use. And the BLM itself has
23 management personnel that take periodic flow trips
24 through the river during the course of their management
25 duties, which I would also suggest would be a commercial

1 use of the river.

2 Okay. To summarize the hydrology and the
3 technical information I provided is that the hydrology
4 indicates that this river had perennial flow, variable
5 by segment, permanent and perennial in all segments that
6 had occurred within a predictable, reliable flow range,
7 and it was sufficient at almost all times to float
8 shallow low draft boats. And it was sufficient
9 seasonally for larger flat-bottom boats, and that
10 there's a well-defined boating channel that conveys the
11 ordinary normal flow of the Gila River throughout its
12 course.

13 I would also point out that in making this
14 decision, I would encourage you to think about the
15 Colorado River as an example. The Colorado River is
16 affirmed to be navigable in the State of Arizona by
17 court cases and as well as in our legislation.

18 The characteristics of the Colorado River is
19 it's subject to flood and drought. It's subject to
20 disastrous floods, according to some descriptions. It's
21 subject to flash floods. There are very large seasonal
22 fluctuations. It's described by one expert as a wildly,
23 wildly varying river, fast current in summer and minimal
24 flow in winter. There are many rapids. Lieutenant Ives
25 described the river as having a constantly shifting

1 channel with numerous obstacles. It has a compound
2 channel, some of which portions are braided. The
3 channel position changes due to flood, erosion, and
4 meandering. There are sandbars. There are islands.
5 One description described it as ever changing sandbars
6 that hindered navigation. Subject to tidal bores, high
7 tides. It's not listed in the Rivers and Harbors Act of
8 1899.

9 And my conclusion from these descriptions of
10 the Colorado River, the navigable Colorado River, is
11 that those characteristics are not definitive evidence
12 of nonnavigability. The Colorado River is navigable and
13 it has those characteristics. Therefore, the presence
14 of those characteristics is not evidence of
15 nonnavigability.

16 So what is evidence of nonnavigability? It's
17 some kind of scientific evidence, historical evidence
18 that it's not deep enough for boating, not wide enough
19 for boating, and there are some natural obstructions
20 that prevent boating over long reaches, not momentary
21 obstacles. I've been here for 21 years -- seems like
22 today has been that long, but it's been a long time. In
23 our first reports that went in 21 years ago, we pointed
24 out that whether it's navigable depends on whether we're
25 considering the ordinary and natural condition. We also

1 pointed out what modes of travel constitute a highway of
2 commerce and in what type of boat and what duration of
3 boatable conditions is sufficient. Those were the
4 conclusions of our report 21 years ago, and it seems
5 like not that much has changed.

6 But I would point you and encourage you to
7 look at the Daniel Ball Test, the federal test for
8 navigability, in making that decision for the Gila in
9 its ordinary and natural condition, whether it was used
10 or susceptible to use for trade and travel on water.
11 And based on the information that I presented you
12 today -- well, it certainly existed as of the time of
13 statehood and still exists today.

14 It was used occasionally as a highway of
15 commerce and it certainly was by its depth and its flow
16 rates susceptible for use as a highway of commerce, for
17 different types of trade and travel on water -- not all
18 types, but some types -- and the customary modes of
19 travel that were used as of the time of statehood.
20 Therefore, I conclude that it was a navigable
21 watercourse.

22 Q. And again, Mr. Fuller, as a scientist and
23 someone that's been involved with this river system for
24 over 21 years, do you have any doubts that the Gila
25 River and all of its segments were navigable in their

1 ordinary and natural condition prior to February 14th of
2 1912?

3 A. I have no doubts.

4 Q. Thank you very much.

5 MR. KATZ: And that, I believe, concludes our
6 direct examination of Mr. Fuller.

7 CHAIRMAN NOBLE: Do the Commissioners have any
8 questions for Mr. Fuller?

9 VICE CHAIRMAN HENNESS: Lots of them, but not
10 today.

11 CHAIRMAN NOBLE: Mr. Fuller, just a couple of
12 questions. You conclude that both the river and each of
13 the segments were navigable; is that correct?

14 THE WITNESS: That's correct.

15 CHAIRMAN NOBLE: Why divide it into segments?

16 THE WITNESS: Because they have different
17 characteristics in each reach that I think should be
18 discussed separately. And it's also important to
19 characterize the historical evidence as it's presented
20 as applying to a specific segment of the river rather
21 than the river as a whole. So someone's description of
22 what the river looked like at the Pima Villages in
23 Segment 6 is not applicable to the description of the
24 river in the Gila Box.

25 CHAIRMAN NOBLE: Tomorrow we will begin at

1 9:00 a.m. We would like to start at 8:00, but we will
2 start at 9:00 a.m. tomorrow and 8:00 a.m. on Wednesday.
3 We will notice the 8:00 a.m. start tonight. Yes?

4 MS. HERNBRODE: Mr. Chairman, I apologize. I
5 misspoke at the beginning of the day. Our boating
6 expert will be here first thing Wednesday morning, not
7 first thing Tuesday morning.

8 CHAIRMAN NOBLE: And tomorrow we will begin
9 questioning Mr. Fuller from other people. We won't call
10 it cross because we know you'll be kindly. So we'll see
11 you tomorrow at 9:00.

12 MR. KATZ: Thank you, all, very much.

13 (The proceeding recessed at 4:45 p.m.)

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1 STATE OF ARIZONA)
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I, GARY W. HILL, Certified Reporter No. 50812
 for the State of Arizona, do hereby certify that the
 foregoing printed pages constitute a full, true and
 accurate transcript of the proceedings had in the
 foregoing matter, all done to the best of my skill and
 ability.

WITNESS my hand this 27th day of June, 2014.



GARY W. HILL, RMR, CRR
 Certified Reporter
 Certificate No. 50812

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BEFORE THE
ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN THE MATTER OF THE NAVIGABILITY)
OF THE GILA RIVER FROM THE NEW) NO. 03-007-NAV
MEXICO BORDER TO THE CONFLUENCE)
WITH THE COLORADO RIVER, GREENLEE,) ADMINISTRATIVE
GRAHAM, GILA, PINAL, MARICOPA AND) HEARING
YUMA COUNTIES, ARIZONA.)
_____)

At: Phoenix, Arizona
Date: June 17, 2014
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VOLUME II
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1 BE IT REMEMBERED that the above-entitled and
2 numbered matter came on regularly to be heard before the
3 Arizona Navigable Stream Adjudication Commission, State
4 Senate Building, Hearing Room 1, State Senate Building,
5 1700 West Washington Street, Phoenix, Arizona,
6 commencing at 9:00 a.m. on the 17th day of June, 2014.

7

8 BEFORE: WADE NOBLE, Chairman
9 JIM HENNESSY, Vice Chairman
10 JIM HORTON, Commissioner
11 BILL ALLEN, Commissioner

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1 CHAIRMAN NOBLE: Good morning. We welcome you
2 back to the Gila River hearing of the Navigable Stream
3 Adjudication Commission. We will begin this morning
4 with Mr. Fuller continuing and Mr. Hood. Please begin.

5 MR. HOOD: Thank you, Mr. Chairman.

6

7

JONATHAN EDWARD FULLER,
8 called as a witness on behalf of State Land Department,
9 was examined and testified as follows:

10

11

CROSS-EXAMINATION

12 BY MR. HOOD:

13 Q. Good morning, Mr. Fuller.

14 A. Good morning.

15 Q. My name is Sean Hood. I represent Freeport
16 Minerals Corporation. Rich Burtell, our expert witness,
17 is here today, and I expect that Shilpa Hunter Patel,
18 Freeport Minerals' Senior Water Counsel, will be here,
19 schedule permitting, throughout the week.

20 Mr. Fuller, I left a few documents up there.
21 We may cross-reference as we go through our discussion
22 today, our friendly discussion. I was told not to do
23 cross-examination. We're just having a conversation.
24 So, anyway, I've got some documents up there. We'll
25 walk through them. And they include your upper Gila

1 report that you revised in 2003; is that right?

2 A. Yes, it does include the 2003 revision of the
3 upper Gila report.

4 Q. I'll probably just refer to it as the upper
5 Gila report. Will that work for you?

6 A. That's fine.

7 Q. Great. You were nice enough to bring your
8 PowerPoint back. We'll certainly go through some of
9 your slides from yesterday. You also should have the
10 hearing transcript from the 2005 proceedings on the
11 Gila. Is that there?

12 A. That's right here.

13 Q. Okay. And then you probably also have the
14 declaration of Rich Burtell concerning the upper Gila
15 River?

16 A. Yes, I do.

17 Q. Great. Let's start with that, because I think
18 we can get that out of the way and I can actually make
19 some room for you.

20 Some of my questions for you today,
21 Mr. Fuller, are going to be specific to the upper Gila
22 River, and I'll probably say upper instead of Segments 1
23 through 3, okay?

24 A. So by upper Gila, you mean Segments 1 through
25 3?

1 Q. Generally speaking, and I understand there's
2 an issue about there was some flow data just downstream
3 of Coolidge and therefore that sort of incorporates 4.

4 A. Right.

5 Q. So don't, don't -- if I say upper and you
6 think you need to clarify that I'm also referring to
7 that stream flow data, please do correct me or make that
8 clarification. Okay?

9 A. Very good.

10 Q. Thank you. Would you turn to Table 15 of
11 Mr. Burtell's declaration. I think I tabbed it for you
12 on the right.

13 A. It is tabbed.

14 Q. Great. And Mr. Burtell here has compiled four
15 accounts of historic boating pre-statehood along the
16 upper Gila. Have you had a chance previous to today to
17 take a look at this table?

18 A. Yes, I did.

19 Q. Are you aware of any other instances of
20 boating before statehood on the upper Gila River other
21 than these four examples?

22 A. Just the ones that I presented yesterday. I
23 would have to go back and look through that list and
24 separate them out by segment again.

25 Q. Okay. Well, let's do that, because I

1 definitely want to make sure we have a universe of
2 historic accounts.

3 A. Are you ready?

4 Q. I am, yes.

5 A. Okay. So I'm at slide 100. These two
6 descriptions, such as they are, occurred in the upper
7 Gila reach as you defined it. Chiricahua Apaches and
8 the Spanish explorers encountering what they call the
9 River of Rafts.

10 Q. We're referring to, we're referring to slide
11 number 100 on Mr. Fuller's navigation PowerPoint from
12 yesterday; is that right?

13 A. It's the navigability of the Gila River.

14 Q. Right. What are your references for these two
15 examples?

16 A. I believe these are referenced from the
17 Tellman report that was submitted previously to ANSAC.
18 Let me check in my notes and see if I wrote it down.

19 Q. Would that be the chapter that was included in
20 the Final Report: Criteria for Assessing Characteristics
21 of Navigability for Small Watercourses in Arizona?

22 A. Barbara Tellman had three different sources.
23 One was a presentation she gave to ANSAC. It was a
24 slide presentation, and there is information and
25 transcript that goes with that. There is a chapter in

1 one of the Stantec reports that relates to boating in
2 Arizona in general. And then also she had an article
3 that she had submitted to some historical society that's
4 in the evidence that the Arizona Attorney General
5 submitted. Those are the sources that I was considering
6 from Tellman.

7 Q. Okay. Let's skip ahead then to talking about
8 the bull boats. Let's take, let's take a look at the
9 upper Gila report, if you would, Mr. Fuller, and Page
10 3-1. Are you there?

11 A. I am there, yes.

12 Q. This is the page that begins Introduction; is
13 that right?

14 A. Yes, it does.

15 Q. Okay. If we go, it looks like three sentences
16 down on that first paragraph, it says the Chiricahua
17 Apache only rarely practiced agriculture but are
18 reported to have built bull boats across streams, open
19 parenthetical, although not specifically the Gila or San
20 Francisco Rivers. Isn't that what you put in your
21 report?

22 A. You're reading that correctly, yes.

23 Q. The other thing you have there is the Rio de
24 las Balsas, River of Rafts. And first off, those were
25 to cross rivers, not to go up and down them, correct?

1 A. That's as I understand it, yes.

2 Q. Let's take a look at the hearing transcripts,
3 November 16, and you had, you had members of your
4 project team testifying back with you at the '05
5 proceedings; is that right?

6 A. Yes.

7 Q. Okay. And who was Mr. Gilpin?

8 A. Mr. Gilpin is a historian-archaeologist.
9 Works for SWCA, Flagstaff.

10 Q. If we stay on Page 68, there's a question at
11 the top there on line 2, "But there are no accounts on
12 the Gila?" And this is Mr. Gilpin testifying. You can
13 see that on Page 67.

14 And he says, "Oh, yeah. There's also the --
15 and John reminded me..." and he's referring to you.
16 "There is reference in the Coronado Expedition to the
17 Rio de -- River of Rafts." And then he goes on. Do you
18 see that, that discussion?

19 A. I do.

20 Q. Okay. And then the next question is, "But it
21 is not clear, based on your evidence that you looked at,
22 that it was the Gila River. Is that correct?"

23 "That's correct."

24 Was that the testimony that day?

25 A. It was.

1 Q. And you didn't correct Mr. Gilpin's testimony
2 in that regard, did you?

3 A. Not at that time, no.

4 Q. Okay. Any other, any other examples of
5 boating accounts on the upper Gila River prior to
6 statehood other than what's in Mr. Burtell's Table 15?

7 A. One moment. James Ohio Pattie. There is a
8 statement in Davis's master's thesis that Pattie claimed
9 to have canoed from Safford to Yuma several times.

10 Q. Have you read James Ohio Pattie's memoirs?

11 A. Not in complete.

12 Q. So if there's evidence for that in his
13 memoirs, you haven't read it. You couldn't point me to
14 that location?

15 A. I'm pointing at the scholarly thesis that
16 concluded that report.

17 Q. And I have the personal narrative of Pattie.
18 If you could point -- it doesn't sound like you could
19 point me to where in here it says he --

20 A. I could not.

21 Q. -- went up and down the Gila multiple times?

22 A. I could not.

23 Q. Okay. If we look -- if we stay on Table 15 of
24 Mr. Burtell's declaration, we have, in 1869 we have a
25 raft. In 1886 we have a dugout canoe. In 1891 we have

1 an unknown craft, and then in 1859 we have flat-bottomed
2 craft, and that was the Evans and Adams Excursion you
3 talked about yesterday. Do you agree with Mr. Burtell's
4 accounting of what those craft were?

5 A. Yes. Meaning by boat type, you're talking
6 about?

7 Q. Correct.

8 A. Yes. I agree with that.

9 Q. Mr. Fuller, let me try and summarize what I
10 took away from yesterday. It seems to me that your
11 understanding of the Daniel Ball Test is if you can
12 float a canoe down a stream, that satisfies navigability
13 for purposes of title. Is that a fair summary?

14 A. It's a partial summary. I would agree with
15 the statement.

16 Q. Is there any other clarification you would
17 need to make that more complete?

18 A. Well, I believe yesterday I showed that other
19 boats could be floated down the Gila River, not just
20 canoes.

21 Q. I appreciate that clarification. But if you
22 can float a canoe, you think Daniel Ball has been
23 satisfied?

24 A. Yes.

25 Q. What year -- until what year, approximately,

1 do you believe that the Gila River remained in its
2 ordinary and natural condition?

3 A. I believe with the onset of irrigation
4 diversions in the 1860s, that's when the ordinary and
5 natural condition was materially -- began to be
6 materially changed.

7 Q. And I think that's pretty consistent with what
8 Mr. -- I think this was Mr. Huckleberry back in 2005.
9 He testified, and by the late 1860s there were very few
10 diversions, Anglo-European diversions. Is that
11 consistent with what you just said?

12 A. Yes.

13 Q. Okay. And you're -- I think you touched upon
14 a little bit -- well, maybe you didn't. Are you
15 familiar at all with the Globe Equity Decree?

16 A. Just by name.

17 Q. Okay. And I don't think we probably need to
18 find it in one of your two reports from '03, but you do
19 discuss some of the dates at which the first canals were
20 built and diverting water, and those are documented in
21 the Globe Equity Decree. Early 1870s were some of those
22 first diversions. Is that consistent with your
23 understanding?

24 A. My understanding was in the 1860s, 1860, 1870,
25 I'm not willing to --

1 Q. That general time frame?

2 A. Sure.

3 Q. Did I understand you correctly yesterday,
4 Mr. Fuller, to say that you concluded personally that
5 the San Pedro was not navigable in its ordinary and
6 natural condition as of statehood?

7 A. Yes.

8 Q. Did you consult with the Arizona State Land
9 Department when it was making its decision how to
10 proceed with respect to the San Pedro?

11 A. Yes.

12 Q. And you gave them that opinion, and they ended
13 up not taking a position on navigability on the San
14 Pedro; is that right?

15 A. I did give them that opinion. They did
16 conclude that. Not necessarily one led to the other
17 solely, but that may have been part of their
18 decision-making process.

19 Q. And you gave similar input on the Santa Cruz;
20 is that right?

21 A. I did.

22 Q. Okay. Focusing on the -- what was your
23 opinion as to the navigability of the San Francisco,
24 going back in time a little bit?

25 A. Yeah, the State and I disagree on that one. I

1 felt like there was sufficient evidence that it could be
2 a navigable stream, and the state felt like that was not
3 the case.

4 Q. And I think that's because you concluded, you
5 concluded in your upper Gila report, which also included
6 a discussion of the San Francisco River, you concluded
7 that there was probably about a foot of flow in ordinary
8 and natural conditions on the San Francisco; is that
9 right?

10 A. Yeah, it's been, what, 11 years since that San
11 Francisco stuff I've looked at. That certainly could be
12 true. You probably have a chart that says that.

13 Q. And I can -- I can actually point you to it
14 quickly, if you don't mind. Upper Gila River report
15 from '03. If you go to 5-25.

16 A. Uh-huh.

17 Q. It says, "The average flow depth in the river
18 was probably about one foot." And you can confirm that,
19 if you like.

20 A. You're on Page 5-25?

21 Q. 5-25, yes, it's the summary paragraph in the
22 middle of the page, the second sentence.

23 A. Right. It does say that. I'd want to look
24 specifically at the rating curves and the seasonality,
25 but it does say that, about one foot. One foot would be

1 consistent with my testimony of yesterday. There are
2 also instances of floating logs on that river and people
3 do continue to canoe it today.

4 Q. So the fact that you felt there was probably
5 about a foot of flow, that was a big part of your
6 personal conclusion that the San Francisco probably was
7 navigable?

8 A. That was a part of it.

9 Q. Why did the state disagree with you?

10 A. I don't know.

11 Q. San Pedro, San Pedro in its ordinary and
12 natural condition had how much water, Mr. Fuller?

13 A. I don't recall at this point. I'm sorry.
14 It's been a long time.

15 Q. What's your minimum threshold for finding
16 navigability on a -- from a depth perspective? It's all
17 about depth you said yesterday.

18 A. It is all about depth. I think you could --
19 as I testified yesterday, a half foot of depth is
20 sufficient to float canoes. To clarify that a little
21 bit, I think that you want a half foot of depth more
22 than just one day a year, more than just a couple days a
23 year. I think you would want some regularly occurring
24 minimum depth of a half foot, predictably, and above
25 that from time to time.

1 Q. Didn't we have that on the San Pedro in its
2 ordinary and natural condition?

3 A. You know, I just didn't come prepared to talk
4 about the San Pedro.

5 Q. If you would be so kind, Mr. Fuller, as to go
6 to -- let's go to your boating PowerPoint, if we could.
7 I've tried to shuffle things so we'll stay on one
8 PowerPoint or the other, and if we have to bounce a
9 little bit, I apologize in advance.

10 Just to, just to tie the loop and make sure I
11 understand comprehensively. We've got Mr. Burtell's
12 Table 15. You mentioned Pattie. You mentioned the bull
13 boats and the river rafts. Any other instances of
14 boating the upper that you would contend occurred prior
15 to statehood?

16 A. That's in the other presentation, and let's
17 just go through the accounts here.

18 MS. HERNBRODE: Sean, would you like me to
19 turn the lights off so that's a little more visible?

20 THE WITNESS: I'm happy because I'm looking at
21 my computer screen.

22 MS. HERNBRODE: Well, I know you are.

23 MR. HOOD: It works for me if it would be
24 easier for the Commission to have it darker. I'm
25 flexible.

1 CHAIRMAN NOBLE: Mr. Henness has not
2 complained.

3 VICE CHAIRMAN HENNESS: About sleeping?

4 THE WITNESS: I believe this is the same
5 account. We're citing different newspapers and slightly
6 different dates, but I think it's the same account.

7 BY MR. HOOD:

8 Q. Which account is this, referring to
9 Mr. Burtell's paper?

10 A. The boating presentation, slide 109, and it's
11 the third in his Table 15, 1891, 208 men. It sounds
12 about the same.

13 Q. That was my interpretation as well. I think
14 you're right.

15 A. Yeah, I think that's it.

16 Q. Okay. And actually, I want to shift gears.
17 Is it all right if I approach the witness? I neglected
18 to give him one of my documents.

19 CHAIRMAN NOBLE: Yes. You have been kind not
20 to cross, so you can approach the witness.

21 MR. HOOD: I appreciate that, Mr. Chairman.

22 BY MR. HOOD:

23 Q. And what I've just handed Mr. Fuller is the
24 Final Report: Criteria for Assessing Characteristics of
25 Navigability for Small Watercourses in Arizona, and this

1 was prepared by Stantec Consulting, Stantec Consulting
2 in association with J.E. Fuller, and the University of
3 Arizona Water Resources Research Center. Is that
4 correct, Mr. Fuller?

5 A. That is correct.

6 Q. And I would like to -- it's true, Mr. Fuller,
7 that as a general proposition, pre-statehood in Arizona
8 or from a -- let me back up. Let me rephrase that.

9 From an archaeological perspective as well as
10 from a pre-statehood historical perspective, more
11 generally, it's true that boats traveling through
12 Arizona did not usually travel up and down the rivers;
13 is that right?

14 A. The record indicates with the exception of the
15 steamboats outside of the reach of your concern, all of
16 the accounts are in the downstream direction.

17 Q. In fact --

18 A. Or crossing the river.

19 Q. And if we look at Page 25 of the Criteria For
20 Assessing Characteristics of Navigability for Small
21 Watercourses in Arizona, you see the third paragraph
22 there? It says, "People who traveled."

23 A. You said page 25?

24 Q. Page 25, yeah.

25 A. The paragraph starts with "People who

1 traveled"?

2 Q. It begins "Boat use by settlers and
3 prospectors."

4 A. Got it. Okay.

5 Q. Sorry. That was the heading. The actual
6 text, body text begins, "People who traveled through
7 Arizona on their way to someplace else used ferries but
8 were not usually involved in travel up and down rivers."
9 Correct?

10 A. Correct.

11 Q. So the examples, the examples that we have, a
12 few isolated incidents, those are in fact the exception.
13 Most did not travel up and down the rivers, correct?

14 A. I'm not sure that's correct. I have no idea
15 of the number of people who used ferries versus the
16 number of people who were using other kinds of boats, so
17 I really couldn't say that one way or the other.

18 Q. I guess the clause that I'm focused on is that
19 these people were not usually involved in travel up and
20 down rivers.

21 A. As a general rule, people were doing other
22 things with their days other than traveling on rivers,
23 if that's what you mean. Mostly they were farming or
24 mining or traveling other ways.

25 Q. Let's take a look at your boating PowerPoint,

1 Page 7. Okay? And this PowerPoint, Page 7 of the
2 boating PowerPoint, is historical boat types, circa
3 1912. Is that right, Mr. Fuller?

4 A. That is right.

5 Q. Okay. And it identifies some boats available
6 in and near Arizona, circa 1912. Those include
7 steamboats; is that right?

8 A. That's right.

9 Q. And I think we've just been over -- those were
10 never used on the upper Gila, correct?

11 A. That's correct.

12 Q. And, in fact, I think you would admit that
13 steamboats could not have been used on the upper Gila in
14 its ordinary and natural condition?

15 A. Yes.

16 Q. Flatboats, skiffs, scows, and rafts, I think
17 we have a raft, a flat-bottom and an unknown on
18 Mr. Burtell's chart. But those are the only instances
19 that you're aware of of someone using one of those types
20 of craft in the upper Gila River; is that right?

21 A. The flatboats, scows and skips and rafts?

22 Q. Yes.

23 A. Historically, those are the only accounts that
24 we have, yes.

25 Q. Canoes, we have, going back to the PowerPoint,

1 the next one is canoes, and we have one dugout in 1886;
2 is that right?

3 A. Yes.

4 Q. And then you mentioned Pattie, and we'll
5 probably address him in a different way later. But any
6 other instances of canoes in the upper Gila prior to
7 statehood?

8 A. There's the one account in Granger that says
9 that Stanley Sykes, I think it was, canoed from Clifton
10 to Yuma, and my interpretation of that was it was the
11 other Sykes, but that's the only other one that's
12 mentioned.

13 Q. Correct. And we'll talk a little bit about
14 Sykes. My understanding is that he traveled from
15 Phoenix to Yuma. Did you -- having read all of this
16 stuff, do you really think he was traveling in the upper
17 Gila?

18 A. Well, perhaps I misspoke. Let's look.

19 Q. That was in your presentation yesterday. And
20 I've been going through the materials. It's my
21 interpretation he started in Phoenix, but we can get
22 there later, if you would like. Whatever is easiest.

23 A. It's your time, so --

24 Q. Okay. Rowboats, dories, and riverboats. Do
25 we have any evidence of use of any of those craft in the

1 upper Gila River prior to statehood?

2 A. Well, there's the unknown boat that could
3 potentially fit into that category. But other than
4 that, no.

5 Q. And then you talked about many others
6 available -- inflatables, motor, kayaks, dugouts. We
7 have one dugout that we've already talked about. I sort
8 of lumped that in with canoes. Any examples of
9 inflatables, motor, or kayaks on the upper Gila River
10 prior to statehood?

11 A. No.

12 Q. Your next bullet point there on that slide is
13 "Boats were adapted to fit specific rivers and uses."
14 And you gave one example of that yesterday, but it
15 didn't relate to the upper Gila River. Do you have any
16 examples where someone coming into the area said this is
17 the kind of boat that I need to do in a different way
18 for the upper Gila River and made that sort of
19 adaptation?

20 A. No, I don't.

21 Q. Page 11 of your boating PowerPoint,
22 Mr. Fuller, if you could turn there. And this is an --
23 this is an excerpt that you included in your PowerPoint
24 from the Utah case that was decided in 1931; is that
25 right?

1 A. That's correct.

2 Q. And the Special Master looked at some
3 different rivers in the State of Utah; is that your
4 understanding?

5 A. That's my understanding.

6 Q. Have you read the Special Master's report?

7 A. Most of it.

8 Q. Do you recall what he had to say about the San
9 Juan River?

10 A. Not specifically.

11 Q. Okay. And do you know what kind of depths he
12 found there to be on the San Juan River?

13 A. I don't recall it from reading it. I know
14 some of the other experts had pointed out certain
15 depths, but my understanding is the depths that the
16 Special Master found are not particularly binding on any
17 other decision anywhere else.

18 Q. And so he did -- he did, looking here, he
19 noted a wide cross section of available craft; is that
20 right?

21 A. Yes.

22 Q. Some of them have more draw requirements; some
23 of them have lower draw requirements; is that right?

24 A. That's also correct.

25 Q. Okay. And in fact, he looks at some of the

1 same craft you did. He looked at rowboats drawing 6 to
2 12 inches. And he looks -- I'm not seeing it right now,
3 but I'm pretty sure he had a canoe up there somewhere;
4 is that right?

5 A. Yes, it's in the second bullet.

6 Q. Thank you. And he also had scows drawing 8
7 inches, right?

8 A. Yes.

9 Q. The end of the first bullet. Okay. And so
10 having noted those craft, if the Special Master had
11 determined that the San Juan River was between one and
12 three feet for 219 days each year, and for the other 146
13 days had a depth of over three feet, and yet he
14 determined that stream was not navigable; is it safe to
15 say that's just inconsistent with your view of the
16 Daniel Ball Test? It's all about depth, in your view.

17 A. Yes, that is consistent, and no, I don't think
18 that the findings of the Special Master for Utah are
19 particularly binding on this hearing here.

20 Q. That wasn't my question. Let me back up. I
21 think you said "consistent," and maybe you meant
22 "inconsistent," so I need to clarify, and I'm not
23 really -- this is going to go a lot faster if you don't
24 interject what you think is relevant or not. That's not
25 really what we're here to talk about today.

1 My question for you is, if the Special Master
2 determined that the entire year it was over a foot and
3 for 219 days it was between one and three feet, and for
4 the remainder of the year it was over three feet -- and
5 in your mind it's all about depth -- and he determined
6 that that stream was nonnavigable, that's just
7 inconsistent with your view of the Daniel Ball Test;
8 isn't that true?

9 A. Well, I guess my opinion is, if the Special
10 Master were looking at the Gila, he would find it
11 navigable.

12 Q. He would find it navigable having found the
13 San Juan nonnavigable?

14 A. Yeah.

15 Q. Okay. Well, let me take it one piece at a
16 time.

17 First of all, so do you think that the Special
18 Master's determination regarding the San Juan is
19 consistent with your view of the Daniel Ball Test?

20 A. Can you repeat the question?

21 Q. Yeah.

22 A. I wasn't prepared to talk about the San Juan
23 River, so I'm trying to dissect the parts of the Special
24 Master's decision that relate to the San Juan from what
25 we're talking about here today on the Gila.

1 Q. I can represent to you -- and if you'd like a
2 copy, I'm happy to provide it to you. But he found that
3 for the San Juan for 219 days out of the year, it had
4 between one and three feet of flow. For the rest of the
5 year he found it had over three feet of flow. He
6 determined that stream to be nonnavigable.

7 And so I'm asking you, based upon your
8 interpretation and application of the Daniel Ball Test,
9 is he at odds with your view of how that test is
10 applied? It's all about depth in your view, and it
11 always had a depth over a foot.

12 A. Well, as you've represented his opinion, and
13 neglecting any other factors that went into his
14 decision-making that's totally left out, if his decision
15 was made solely on that, then yes, we disagree about
16 depths.

17 Q. You would agree that as a general matter,
18 Mr. Fuller, that draw is not equivalent to the depth
19 that's required to navigate a boat, because you have to
20 account for load. You have to account for the weight of
21 the occupants, et cetera, correct?

22 A. The draw includes the load.

23 Q. Okay. Don't we at times have specified draw,
24 and that's the base draw for a boat; and then as you add
25 more into it, the draw increases, correct?

1 A. Correct.

2 Q. Okay. So if you say a craft has 6 inches of
3 draw, that draw changes based on how much you put in
4 there?

5 A. Usually, yes.

6 Q. Okay. And you'd agree that the draw, even
7 having taken into account the draw required for the
8 load, that draw is still not representative of your
9 minimum depth, because you still need to account for the
10 needs of the paddler, right?

11 A. I think you're starting off in the wrong
12 place. Are you saying that a canoe draws 6 inches
13 unloaded?

14 Q. No. I'm saying, I'm saying irrespective of
15 what the draw is, that's not your minimum depth, because
16 you still need to account for the occupant's ability to
17 steer the craft and paddle?

18 A. If a boat draws 8 inches, 6 inches is not
19 going to be enough to float a boat.

20 Q. But if it draws 8 inches, 8 inches isn't
21 enough either. You need more than that.

22 A. You could probably get over an obstacle that's
23 at 8 inches; but if the river is consistently 8 inches
24 deep and your boat draws 8 inches --

25 Q. You're not going anywhere.

1 A. -- you're going to go there pretty slow. Yes,
2 that's correct.

3 Q. Would you please turn to Page 20 of your
4 boating PowerPoint. And here you're referencing
5 steamboats used on the navigable Colorado; is that
6 right?

7 A. Yes.

8 Q. And we've already discussed, you couldn't have
9 used a steamboat on the upper Gila River in its ordinary
10 and natural condition. But I still want to follow up
11 with a couple of questions. What depths did the
12 Colorado have in its ordinary and natural condition?

13 A. I don't recall specifically.

14 Q. Can you give me a general range?

15 A. I don't recall specifically.

16 Q. How about generally?

17 A. Deep enough to float steamboats.

18 Q. Okay.

19 A. But I really don't have a number for you.

20 Q. Was it as a general matter deeper than the
21 Gila River?

22 A. As a general matter, at its median flow rate
23 comparing apples-to-apples, probably, but I really don't
24 know for sure. You said the upper Gila, right?

25 Q. My last question was about the Gila generally.

1 A. I'm not sure in the lower. In Segment 8 they
2 may have been very similar.

3 Q. But taking the Gila as a whole, if you're
4 looking at the general range of median flows, the
5 Colorado is a bigger, deeper river, correct?

6 A. It is a higher flow river. Whether it's
7 deeper or not, I really can't tell you.

8 Q. Yesterday you had a slide -- oh, boy. You had
9 a slide on steamboat usage, and this is, unfortunately,
10 your navigation section, but you talked about running up
11 to Dome and you talked a little bit about that.

12 A. Yes.

13 Q. My question is just, what is your source of
14 information suggesting that steamboats went as far as
15 Dome on the Gila River?

16 A. Do you recall the slide number?

17 Q. I do, yeah, it's 99. And you have some
18 sources on the margin there, but it's not clear which of
19 your bullet points each one relates to.

20 A. I'm citing also Dr. Lingenfelter's declaration
21 regarding up to -- you're asking specifically regarding
22 Dome.

23 Q. Yeah.

24 A. As I sit here today, I don't recall which of
25 those articles that relates to.

1 Q. But do you believe, do you believe that the
2 excursions to Dome are going to be covered in one of the
3 three or more of the three citation -- references you
4 have there?

5 A. That or in the original Land Department report
6 which I made notes for myself that discuss those. I
7 have just this general recollection over the past 22
8 years talking about the Gila, Land Department folks who
9 were original authors of this report talking about the
10 use up to Dome.

11 Q. Turn, if you would -- here we go. Would you
12 turn to Page 49 of your boating PowerPoint, please?

13 A. Okay.

14 Q. And here we're talking about canvas folding
15 boats; is that right?

16 A. Yes.

17 Q. And we have minimum depth of flow of three
18 inches; is that right?

19 A. Yes.

20 Q. And how much water do you feel you need to
21 complete the Daniel Ball Test with respect to a canvas
22 folding boat?

23 A. You know, I think the three inches there is a
24 spec from people who made that boat. I think three
25 inches is kind of irrelevant, because I think the

1 minimum depths, even at base flow rates, were greater
2 than three inches even in the upper Gila River.

3 Q. I'm going to have a lot of questions for you
4 today, Mr. Fuller, that you might find no relevance in.
5 And that's not really the purpose for these questions
6 and answers. You've got to answer my question. My
7 question is, how much water do you need to float that
8 boat?

9 A. Three inches.

10 Q. Three inches. So any stream that has three
11 inches of water, do you feel satisfies the Daniel Ball
12 Test?

13 A. No, that's not what I said at all.

14 Q. Okay. Well, explain to me why that's not the
15 case.

16 A. I think for the Gila River -- which is why
17 we're here today -- three inches, it just doesn't
18 matter. It doesn't exist on the river, so --

19 Q. I'm asking -- I'm not asking about the Gila.
20 I'm asking hypothetically. If you have a stream that
21 has three inches of flow and that's its ordinary and
22 natural condition, based upon the minimum depth of flow
23 you have indicated here for a canvas folding boat, does
24 that in your mind make that a navigable stream under the
25 Daniel Ball Test?

1 A. I guess you can use this against me whenever
2 we adjudicate a stream that has minimum -- a maximum
3 depth of three inches, but personally I would not say
4 three inches would make a navigable stream.

5 Q. Why not? If you have a craft here you've
6 identified that has a minimum depth of flow of 3 inches?

7 A. Because of my personal experience as a boater.
8 Three inches is just not a lot of fun to boat, not a lot
9 of practical use. It's not very deep. I don't think
10 you would even use it as a highway of commerce at 3
11 inches deep.

12 Q. But at 6 inches deep you're fairly confident
13 you would use it as a highway of commerce?

14 A. Yeah.

15 Q. Can you describe the distinction?

16 A. Three inches.

17 Q. Okay. Good enough for me.

18 It's true -- you had some PowerPoints
19 yesterday about inflatables, and we already talked about
20 there's no evidence of using inflatables along the upper
21 Gila River before statehood. More generally speaking,
22 inflatables were not commonly used in Arizona until the
23 1940s; isn't that right?

24 A. Were not commonly used?

25 Q. Yeah.

1 A. I don't have any evidence that they were
2 commonly used or not commonly used before 1937, I think
3 was the first trip in the Grand Canyon. But I do know
4 that Whipple used it in the mid 1800s.

5 Q. Let's take a look at -- let's take a look at
6 Page 22 of the Criteria for Assessing Characteristics of
7 Navigability for Small Watercourses in Arizona. Page
8 22.

9 A. Okay.

10 Q. Could you read out loud, please, the last
11 sentence of the first paragraph?

12 A. "Use of inflatables, however, did not become
13 common until the development of artificial rubber in the
14 1940s."

15 Q. And this report goes on to say that inflatable
16 boats did not become feasible until artificial rubber
17 was developed during World War II. Do you recall that
18 in this report?

19 A. I don't recall that.

20 Q. It's on Page 32. Second paragraph, second
21 sentence, it says, "Inflatable boats were available as
22 early as the 1850s, but these boats were awkward,
23 difficult to maneuver, and not very durable, and it was
24 not until artificial rubber was developed during World
25 War II that inflatables became feasible." Is that what

1 it says?

2 A. It does say that.

3 Q. Ms. Tellman -- we talked about Mr. Gilpin
4 specifically. Ms. Tellman was also a part of your
5 project team who testified back in 2005; is that right?

6 A. Yes.

7 Q. And she said that native tribes from South
8 America all the way up to Alaska all had some kind of
9 boating if they lived anywhere near water. And I can
10 point you to that point in the transcript, if you'd like
11 to see it. Does that ring a bell?

12 A. It doesn't ring a bell, but I'm guessing that
13 you're not lying about it, so --

14 Q. Do you have any disagreement with that
15 statement?

16 A. Read it to me one more time.

17 Q. Sure. "Native tribes from South America all
18 the way up to Alaska all had some kind of boating if
19 they lived anywhere near a river."

20 A. Well, I agree that she said that, but I really
21 don't have any knowledge of native tribes up and down
22 the coast. I can't verify it or disclaim it.

23 Q. You would agree that as a general matter
24 there's a lot of evidence of tribes and native peoples
25 living near rivers and boating those rivers, correct?

1 A. Sure.

2 Q. Just as a general matter?

3 A. A general matter.

4 Q. And how do we know that? We know that because
5 of records. We know that because of oral traditions.
6 We know that because of archaeological findings,
7 correct?

8 A. Those would be ways to know those kinds of
9 things, true.

10 Q. You would agree with me that the Gila River
11 has a long record of prehistoric use and occupation,
12 correct?

13 A. Yes.

14 Q. And in fact, the Gila River has been used
15 continuously for more than a millennium; is that right?

16 A. Yes.

17 Q. We have, in fact, a history of a thousand plus
18 years of an irrigation-based civilization, true?

19 A. That's true.

20 Q. And yet there's no archaeological evidence of
21 boating by those people on the Gila River, true?

22 A. Archaeological evidence on the Gila River.
23 I'm not sure that that's true. There's certainly
24 minimal evidence.

25 Q. Any evidence whatsoever of use of the river

1 for trade or commerce by those indigenous peoples living
2 along the river?

3 A. I can't recall any at this time.

4 Q. Let's take a look -- let's take a look at your
5 upper Gila River report from '03 on Page 2-23. If I'm
6 not mistaken, Chapter 2 is relating to archaeological
7 findings; is that right?

8 A. Yes, it is.

9 Q. That chapter titled Archaeological Overview of
10 The Upper Gila and San Francisco River Valleys, and here
11 on Page 2-23 we have a Summary and Conclusions; do you
12 see that?

13 A. I do.

14 Q. Okay. And we have in summary, archaeological
15 studies of the Upper Gila and San Francisco Rivers in
16 Arizona have been fairly limited, and although
17 archaeologists have documented some 11,000 years of
18 human use of southeastern Arizona, and it goes on to
19 describe some of the archaeological study and findings;
20 is that right?

21 A. Yes.

22 Q. The last sentence reads, "Archaeological
23 research has not documented any use of the river for
24 commercial trade and travel nor any regular floatation
25 of logs," correct?

1 A. For this segment of the river upstream of
2 Safford, yeah.

3 Q. You don't disagree with that statement?

4 A. I have no reason to disagree with it.

5 Q. More generally -- because you're right, that's
6 the upper Gila report. But more generally, Mr. Gilpin
7 talked about archaeological evidence relating to the
8 entire river when you testified back in 2005; is that
9 right?

10 A. I would imagine that's correct, yeah.

11 Q. Let's take a look -- let's take a look at the
12 November 16th transcript, Page 47.

13 A. Which date?

14 Q. It's November 16, 2005.

15 A. 47?

16 Q. Yeah. And I'll note for the record you can
17 tell it's Mr. Gilpin testifying back on Page 45. It
18 indicates that he is the witness. And if we go back to
19 47, we have a question that begins on Line 18 on that
20 page. Do you see "Okay"?

21 A. Yes.

22 Q. "And in the case of the river people of the
23 Gila River, you have no knowledge of any record of any
24 nature that at any time over the last 2,000 years these
25 people -- these river people ever used that stretch of

1 the river that is currently encompassed within the Gila
2 River Indian Reservation as a highway of commerce of
3 transportation. Is that correct?"

4 Mr. Gilpin responded, "I do not recall that."

5 In follow-up the questioner said, "I'm not
6 asking if you recall. Do you know of any instance?"

7 And Mr. Gilpin responded, "I can't give you an
8 instance in which I know that that occurred," correct?

9 A. Correct.

10 Q. So we've covered the upper, and then it was
11 actually Mr. Hestand at the time that was talking about
12 the portion of the Gila River that goes through the Gila
13 Indian Reservation. And you don't have any evidence
14 that Mr. Gilpin didn't have about archaeological
15 evidence of use of that stretch of the river, do you?

16 A. I can't recall any today.

17 Q. Any evidence of archaeological use of the
18 river for trade or commerce on any other stretch of the
19 river that you have today?

20 A. No.

21 Q. As I understood, going back to the transcript,
22 as I understood it, you handled, you handled the
23 hydrology and the geomorphology of the upper Gila
24 River -- that's north of Safford -- and Mr. Huckleberry
25 worked downstream of Safford; is that right?

1 A. Yes.

2 Q. Okay. There was a question asked of you back
3 in 2005 towards the end of your testimony, about the
4 lower portion anyway, of the lower Gila, whether you had
5 any opinions as to navigability. And your statement was
6 as to downstream of the confluence with the Salt, you
7 did believe it was navigable; is that correct?

8 A. You need to show me. It's been a long time.

9 Q. Sure, sure, I understand. We're still on
10 November 16th. It's Page 121. Middle of the page, Line
11 12 there's a question from Mr. Helm. "So you have an
12 opinion yourself based on the studies that you have done
13 that -- what I'll call the lower Gila below the
14 confluence where the Salt is in fact -- or was in fact
15 navigable or susceptible to navigation at the time of
16 statehood?" And it goes on, but you give your opinion
17 that you felt that that segment was navigable, correct?

18 A. That's correct.

19 Q. Okay. You did not give any opinions back in
20 2005 as to the navigability or nonnavigability of the
21 upper Gila River in its ordinary and natural condition
22 at the time of statehood; is that correct?

23 A. Not that I recall. And just to clarify, that
24 was our understanding of our role at that time was to
25 not offer opinions, and Mr. Helm was aware of my

1 testimony in another case, and that's the context of
2 this discussion that you're quoting here.

3 Q. Back to your boating PowerPoint. Actually,
4 let me ask you something more generally. You had a few
5 different slides where you talked about populations at
6 various times, and I think you even showed a curve of
7 population growth over time. Do you recall those?

8 A. I do.

9 Q. Those population figures don't include Native
10 American populations, correct?

11 A. I don't know that for a fact. They're U.S.
12 Census Bureau data, and I don't know whether they
13 counted Native Americans or not.

14 Q. Did you look into that?

15 A. No.

16 Q. You start off in the early 1800s with a very
17 low population number. Is it probably a fairly safe
18 assumption that that did not encompass Native American
19 populations at that time?

20 A. I don't know.

21 Q. Let's turn to -- let's see, it's probably,
22 it's probably 58 on your boating PowerPoint. My
23 pagination is a little different. Is this navigability?
24 Is this boating? My pagination is off. Give me one
25 moment.

1 A. You wanted 58 of the Gila River presentation?

2 Q. Boating in Arizona.

3 A. Oh, that's where I was.

4 Q. Okay. Good. Actually, let's go to 62,
5 please. Okay. You talked about -- your explanation for
6 why there wasn't more instance of boating pre-statehood
7 was there weren't enough people here when we had the
8 water; and when there were enough people, we didn't have
9 the water. Is that a fair summary?

10 A. That's part of the reason, yes.

11 Q. In that time frame though while we were still
12 in our ordinary and natural condition, weren't there
13 mining operations in the region?

14 A. Yes.

15 Q. Okay.

16 A. Well, the mining operations, as I understand
17 them, were beginning at about the same time as the
18 diversions. So you didn't have better knowledge of the
19 onset of a particular mining operation, so --

20 Q. Are you aware of the mining operations at
21 Clifton?

22 A. Yes.

23 Q. In that time frame?

24 A. My understanding, I thought they were in the
25 1870s.

1 Q. Well, let me ask you this, Mr. Fuller. Your
2 take on navigability is that the river is still
3 navigable much of the year today even in its depleted
4 state. If you're talking about a few years of
5 diversions in the 1870s, there's not going to be enough
6 impact to get below your threshold, is there?

7 A. Well, that's a different question than what
8 you were just asking me.

9 Q. It's a follow-up though -- if your view of
10 navigability is all you need is six inches, there was
11 still six inches in the upper Gila River in 1873; isn't
12 that right?

13 A. Yes.

14 Q. Okay. So that doesn't really explain away the
15 nonuse of boating at that time, does it?

16 A. But the presence of diversions could have
17 discouraged some people from taking boating expeditions.

18 Q. Why is that, if there was still enough water?
19 It's all about depth.

20 A. Certain people don't like to boat past
21 diversions. It wasn't an open river in some places.
22 Some places water was being taken out.

23 Q. Are you aware of any instance of the Clifton
24 mine ever being supplied by boat?

25 A. No.

1 Q. Are you aware that it was, until the railroad
2 came in, that it was supplied by wagon?

3 A. That doesn't surprise me at all. I'll also
4 point out that Clifton is not located on the upper Gila.

5 Q. Where is it located?

6 A. It's on the San Francisco River.

7 Q. Another stream that you feel is navigable and
8 yet there's no instance of ever supplying that mine
9 using navigation, correct?

10 A. Right, I spent a good deal of time yesterday
11 talking about why the mines might choose not to use
12 boats to ship their supplies and materials.

13 Q. Is it your contention that it was less
14 expensive for mining companies to ship by wagon train
15 than by using navigation? If they're bringing supplies
16 up from Yuma or down to Yuma, is it cheaper to do a
17 wagon train as opposed to use the river?

18 A. My understanding from working for mines is
19 they choose the least cost option for everything they
20 would do. I don't have any specific knowledge about
21 tonnage rates for mules or wagons versus railroad or
22 versus the boat. I can tell you that moving upstream on
23 the Gila River in the kind of boats, as I mentioned
24 yesterday, that the river can support, it would take
25 many, many boats, many, many loads, and you would move

1 very slowly, much slower than a wagon.

2 Q. That's right. Not very feasible to go
3 upstream on the Gila for those purposes, correct?

4 A. Feasible, but not very economical.

5 Q. And in fact, there's virtually no history, and
6 in fact -- let me start over. There's no history
7 pre-statehood of commercial travel upstream on the Gila,
8 correct?

9 A. There are no documented accounts.

10 Q. Commercial or noncommercial upstream travel on
11 the Gila, correct?

12 A. No documented accounts.

13 Q. Do you contend that it would have been faster
14 for mining operations in the upper Gila to ship via
15 wagon as opposed to using the river?

16 A. Yes.

17 Q. You do? What do you base that on?

18 A. Having been boating myself and flipped my boat
19 around and worked my way upstream, it's a lot of work.
20 You go pretty slow. Even going in the downstream
21 direction, two, three miles an hour is a pretty typical
22 rate.

23 Q. I got the -- if you had a higher flow river,
24 you'd be moving faster as a general proposition,
25 correct?

1 A. In the downstream direction?

2 Q. Correct.

3 A. All other the things being equal, more flow
4 generally means more velocity.

5 Q. I got the impression from you yesterday -- and
6 I don't have a quote written down, but I got the
7 impression that your view is if upstream travel is not
8 that feasible or if it's not susceptible to upstream
9 travel, that's not really relevant for the Daniel Ball
10 Test. Was that a fair perception that I had yesterday
11 from your testimony?

12 A. Yes. My understanding of the Daniel Ball Test
13 that I see no mention of the word "upstream."

14 Q. On Page 65, if you would, of this same
15 PowerPoint -- we're still on the boating in Arizona
16 PowerPoint -- you talked about some alternatives
17 available that might be an explanation for the lack of
18 use of the river, and you talked about railroads, and
19 you say there 1870s. There were no railroads in the
20 region prior the 1870s, correct?

21 A. That's my understanding, correct.

22 Q. And we talked a little bit about wagon.
23 Obviously, there were no automobiles in that time frame,
24 correct?

25 A. Not in 1870, no.

1 Q. Right. Right. Any other alternative means of
2 supplying mining operations in that time frame that you
3 feel maybe that's what they were doing instead of using
4 the river?

5 A. There could have been horseback, walking in.
6 I really can't think of any others besides that.

7 Q. And there were also military operations in the
8 upper Gila River in that time frame when we're still
9 dealing with a relatively undepleted stream, correct?

10 A. In the time frame of 1870?

11 Q. Yes.

12 A. I believe that there were some forts out
13 there, yes.

14 Q. And I take it from our earlier discussions
15 that you don't have any evidence suggesting that those
16 forts or military installations were supplied using the
17 river?

18 A. That's correct.

19 Q. And we had Post Offices in that same time
20 frame, is that right, in the 1870s?

21 A. I would imagine. I don't recall
22 specifically.

23 Q. And whether there were or weren't -- and we'll
24 demonstrate that there were -- you don't have any
25 evidence that those Post Offices were being supplied

1 using the river, true?

2 A. I do not.

3 Q. Could you flip, please, to slide 67?

4 A. All right.

5 Q. And you have some segments of Arizona rivers
6 not conducive to carrying major tonnage. In your
7 opinion, Mr. Fuller, would that description apply to the
8 upper Gila River in its ordinary and natural condition
9 at the time of statehood?

10 A. Yes.

11 Q. And again, here we touch upon it again. Not
12 easy to travel upstream, and that would apply to the
13 upper Gila as well?

14 A. Yes.

15 Q. And when you talk about rivers were diverted
16 and dammed before statehood, we've talked about the time
17 frame in which you feel that diversion started to take
18 an impact?

19 A. We have.

20 Q. You had a slide yesterday.

21 A. Yes, I did.

22 Q. Yeah, you had a few of them. You had a slide
23 yesterday talking about the amount of time it took for
24 people to get up to speed on boating and acquiring skill
25 to boat. Do you recall that?

1 A. I do. I'm assuming you would like me to find
2 it.

3 Q. Yeah. I've got it --

4 A. It's slide No. 8 in the boating presentation.

5 Q. Right. Okay. It says, "27 years required to
6 acquire skills and develop the type of boats needed to
7 navigate the Missouri."

8 You don't contend it would have taken 27 years
9 from when people started to populate the Gila River
10 valley to start to boat it. That's not what you mean to
11 say there, I assume?

12 A. What I'm assuming -- no, I guess the shortest
13 answer to your question is no.

14 Q. Because we had people who were adept at
15 boating in the area, right? We already had them on the
16 Colorado going up and down the Colorado and so we had
17 people with the skill in the area, correct?

18 A. There were people on the Colorado who had the
19 skills to move on the Colorado, true.

20 Q. Do you feel that their skills would not have
21 applied to the Gila?

22 A. I think that's one of the points of this slide
23 right here is that you had people who were boaters who
24 were probably using the Mississippi and when they turned
25 to the Missouri, they needed to develop new skills.

1 Probably needed to modify their boats. That says
2 something about evolving the type of boats. So whether
3 it's 27 years or 40 years or 50 years, sometimes it just
4 takes people time to develop the right kind of boat for
5 the river.

6 Q. For someone who is an adept steamboat boater,
7 how hard is it going to be for him to learn to use a
8 dugout canoe? Is it going to take 27 years?

9 A. You know, that's a question about an
10 individual, so, you know, who knows for a particular
11 individual. So hypothetically speaking, depending on
12 the person's physical characteristics, you know -- put
13 it this way. If you had never been in a dugout canoe
14 before, I feel fairly confident I could build you a
15 dugout canoe and get you up to speed in using it within
16 a year. But you look like a pretty healthy guy. Some
17 other folks I try to teach canoeing, and it doesn't
18 work.

19 Q. On Page 69, if you could flip over to 69 of
20 the boating PowerPoint. Okay. You've got a number of
21 bullets here. These are more reasons why you think
22 maybe there wasn't more instances of boating on the Gila
23 in its ordinary and natural condition. One thing you
24 say is you don't own a boat. But we had plenty of
25 instances where you've got cottonwoods there available

1 to build a canoe, right?

2 A. Uh-huh.

3 Q. There were cottonwoods in the area that were
4 suitable for that purpose?

5 A. If you knew what you were doing, you could try
6 to build a dugout. I don't know if you've ever tried to
7 build a dugout. It's not for everybody.

8 Q. There are instances of people navigating the
9 Colorado by doing just that; isn't that correct?

10 A. There are, yes.

11 Q. If you go to the next slide, please, which I
12 think is 70, I think. Yeah. Your fifth bullet down it
13 says, "You can't risk capsizing." And can you explain
14 what you mean by that?

15 A. Whatever it is that you're carrying would be
16 dangerous for it to flip into the water, like your baby.
17 Something like that.

18 Q. Does this apply not only to dangerous
19 circumstances, but perhaps where you're worried about
20 losing the value of what you've been working on all
21 those years?

22 A. Sure, could. If it were nonrecoverable.

23 Q. Today you're going to put it in some sort of a
24 plastic container and tie it off and so forth and you
25 have waterproof containers. Those didn't exist back

1 then, correct?

2 A. I'm not going to put my baby in one of those,
3 but if I had my nugget of gold. Yeah, there were
4 floatation devices and things that you could strap onto
5 parts of your boat, whatnot.

6 Q. Were their failsafe waterproof products
7 available back in its ordinary and natural condition on
8 the Gila?

9 A. You know, I don't even know the answer to
10 that. Could be. I know that the Powell Expedition had
11 sealed compartments in their boats. There weren't
12 plastic Pelican cases, I can tell you that.

13 Q. You talked about some accounts of log floating
14 in Arizona. But that does not apply to the upper Gila
15 River; is that true?

16 A. That's true.

17 Q. Page 76, please, of your boating PowerPoint.
18 Okay. And these are the Federal Minimum Standards for
19 Boating is the title of this slide; is that right?

20 A. That's right.

21 Q. And these are -- these are modern recreational
22 boating standards for recreational craft, right?

23 A. That's the title of the slide, yes -- or the
24 table.

25 Q. Are these referred to as the Hyra method?

1 A. I don't know.

2 Q. Have you seen -- have you seen where at
3 various times Mr. Hjalmarson has relied on these same
4 standards?

5 A. I know that Win had a number of things in his
6 presentation. I don't recall specifically what he used.

7 Q. And if using these standards, the San Pedro
8 would have been navigable in its ordinary and natural
9 condition, you just don't recall. I think we touched on
10 that. You're just not --

11 A. I did not come prepared to talk about the San
12 Pedro.

13 Q. Let's talk about on Page 77 of your boating
14 PowerPoint -- it's the next page. You list some state
15 standards for boating, and one of them is Washington.
16 And it has a depth classification: Probably not, maybe,
17 and probably; is that right?

18 A. That's right.

19 Q. And probably not is for streams of what depth?

20 A. I don't recall specifically. I know it's in
21 Mr. Burtell's report. I believe it's in Mr. Burtell's
22 report. It might have been in Mr. Gookin's report. It
23 was in one of the expert reports that came in.

24 Q. Okay.

25 A. I had never heard of it before, and so we

1 called up the folks that did it and tried to find out
2 what we could.

3 Q. Does it sound about right that under the
4 Washington depth classification if a stream is less than
5 two feet, it is classified as probably not navigable?

6 A. That's my vague recollection, but --

7 Q. If I'm wrong, we can look at the standards.

8 A. There you go.

9 Q. Okay. I want to -- I apologize for circling
10 back. We talked a little bit about bull boats before,
11 and we referenced, we referenced one excerpt from your
12 upper Gila report from 2003. But I want to circle back
13 and also take a look at one other portion of that
14 report. If you go to page 8-3.

15 A. This is in the upper Gila report?

16 Q. Correct.

17 A. All right.

18 Q. This is -- I guess this is a little
19 superfluous. But I just want to point this out. The
20 last paragraph on that page, the second sentence, it
21 reads very similar to the one we read before, but it
22 says, "The Chiricahua Apaches of the region were known
23 to construct boats made of bull hides stretched over
24 wooden frames for crossing streams, although no
25 instances are specifically recorded for the upper Gila

1 and San Francisco Rivers," correct? That's what it says
2 in the report?

3 A. That's what it says in the report. As long as
4 there's a pause here, I'm just going to take the
5 opportunity to say the reason that we believe that to
6 use the Gila River is that absent the Gila or the San
7 Francisco, there aren't a lot of other rivers out there.
8 I'll also say that I don't think the case is made or
9 break based on alleged Chiricahua use of bull boats
10 crossing the stream, so --

11 Q. I agree with that. We're just talking about
12 bull boats going across the channel. Okay. We're in
13 agreement that's probably not extremely relevant.

14 A. And yet you brought it up. And you wanted me
15 to hurry.

16 Q. You brought it up yesterday. I would have
17 skipped over it. I would have rested on the report if
18 that was not in your PowerPoint prominently.

19 Let's take a look at -- let's switch over to
20 your navigability PowerPoint now, please.

21 CHAIRMAN NOBLE: Are we switching?

22 MR. HOOD: To PowerPoint, yeah, a different
23 PowerPoint.

24 CHAIRMAN NOBLE: Is this a good time to take a
25 break?

1 MR. HOOD: Now is a great time, Mr. Chairman.

2 CHAIRMAN NOBLE: Gary, is that good with you?

3 THE REPORTER: Sure.

4 CHAIRMAN NOBLE: We'll take a 15-minute break.

5 (Recessed from 10:11 a.m. to 10:24 a.m.)

6 CHAIRMAN NOBLE: Mr. Hood, you're on.

7 MR. HOOD: Mr. Chairman, I appreciate it.

8 BY MR. HOOD:

9 Q. Mr. Fuller, I want to talk generally about fur
10 trappers that operated along the upper Gila in the
11 1820s. Okay?

12 A. Okay.

13 Q. And those included -- we talked a little bit
14 about Pattie. Also included Ewing Young and Kit Carson;
15 is that right?

16 A. Yes.

17 Q. Okay. And if you take a look at page 8-2 of
18 your upper Gila River report, the middle paragraph there
19 about halfway down, two-thirds down. But let me
20 start -- let me back up a little bit. The third
21 sentence says, "By the 1820s Mexico had won its
22 independence from Spain, and American fur trappers, such
23 as James Ohio Pattie, Ewing Young, and Kit Carson
24 explored the upper Gila and San Francisco Rivers;" is
25 that right?

1 A. Yes.

2 Q. "Trapping beaver along the rivers," correct?

3 A. Yes.

4 Q. "And establishing a travel route into
5 Arizona," correct?

6 A. Yes.

7 Q. Okay. And then the report goes on to say,
8 "These early trappers traveled primarily on horseback or
9 on foot in the study area, although their records
10 indicate that they built and used canoes and rafts when
11 they reached the Colorado River downstream of the study
12 area," correct?

13 A. That's correct.

14 Q. So this is an instance, the river did go where
15 they were going because they ended up, they ended up at
16 the mouth of the Colorado; is that right?

17 A. The river does go from the Gila-San Francisco
18 confluence down to the Colorado, that's correct.

19 Q. And so this -- and I understand what you had
20 to say about Pattie earlier, but you don't have any
21 evidence that Ewing Young or Kit Carson boated the Gila
22 River, correct?

23 A. I do not.

24 Q. Let's talk one more time about Pattie.

25 MR. HOOD: Mr. Chairman, can I approach the

1 witness one more time?

2 CHAIRMAN NOBLE: Yes, thank you.

3 BY MR. HOOD:

4 Q. Okay. This is, this document is titled Man
5 and Wildlife in Arizona: American Exploration Period
6 1824 to 1865 by Goode P. Davis, Jr. And let's take a
7 look at Page 21. If you look a little bit past halfway
8 down, you can see where they're talking about the Beaver
9 River, the San Pedro where Pattie reported that they
10 found beaver in considerable numbers. Do you see that?

11 A. I don't. Which paragraph are you on?

12 Q. It's Page 21. It is -- it is about a little
13 past halfway down. It says, "They pushed on."

14 A. Yes.

15 Q. They pushed on to Beaver River, and goes on in
16 the next paragraph it says, "Back on the Gila, the
17 trappers were forced by hunger to eat some of their dogs
18 and horses." Is that right?

19 A. Apparently.

20 Q. Okay. At the end of that paragraph it talks
21 about the party reached the Colorado on December 1st,
22 1827. Do you see that?

23 A. Yes.

24 Q. And this is -- it was at this point that all
25 but seven of the trappers revolted against the authority

1 of Sylvester Pattie, who I understand was James Pattie's
2 father; is that right?

3 A. That's what I understand.

4 Q. Okay. If we go down to the next paragraph, it
5 says, "Below the mouth of the Gila, misfortune again
6 plagued the eight men of the Pattie company. Indians
7 stole all their horses and the mountain men had to
8 compensate by hollowing out Cottonwood logs to serve as
9 canoes."

10 And if we turn over to the next page, it says,
11 "All the pelts and supplies were loaded" -- then you
12 have to turn to page 22 -- "into the dugouts, and the
13 expedition proceeded downriver on December 9. They
14 hoped ultimately to find a Mexican settlement in the
15 delta of the Colorado to which some Indians had vaguely
16 alluded."

17 Doesn't Mr. Davis's interpretation of the
18 Pattie memoirs indicate that those eight canoes were
19 navigated on the Colorado, were not used on the Gila?

20 A. That seems to be what it's saying right here
21 about the delta area.

22 Q. Well, let's back up. On Page 21 it says, "The
23 party reached the Colorado on December 1, 1827." And
24 then it goes on to talk about them constructing the
25 canoes, right?

1 A. Yeah, I think it might be open to
2 interpretation. In the second paragraph that you read
3 to me, it says, "Back on the Gila, the trappers were
4 forced by hunger to eat some of their dogs and horses.
5 "On November 15, on the lower Gila River, Pattie and his
6 companions stopped to construct a canoe so they could
7 trap both sides of the river which he states was too
8 deep to be forded on horseback. The canoe, presumably
9 some sort of dugout, apparently functioned
10 satisfactorily and the party reached the Colorado on
11 December 1."

12 So it sounds like there is at least one canoe
13 that went from someplace on the lower Gila down to the
14 Colorado. The canoes they're talking about sound like
15 they were in the delta.

16 Q. They were on the Colorado River?

17 A. Yes.

18 Q. Okay. And there was discussion in Pattie's
19 memoir about them constructing a single canoe, and they
20 used that to cross the river back and forth, to lay
21 traps and not have their scent throw off the beavers; is
22 that right?

23 A. Sounds reasonable. I don't know.

24 Q. You aren't familiar with that portion of
25 Pattie's memoirs?

1 A. No.

2 Q. Okay.

3 A. I have seen quotes where he talked about using
4 it to trap beaver. In regard to the scents and whatnot,
5 that I don't know.

6 Q. But you agree that the -- according to this,
7 the 8 canoes are on the Colorado, not on the Gila?

8 A. In the paragraph we just read, they're
9 describing being on the Colorado, correct.

10 Q. On your navigability PowerPoint -- are we
11 still there?

12 A. Yes.

13 Q. On Page 75 towards the bottom, you have a
14 bullet point that reads, "Why did they canoe the
15 Colorado," and then you say, "There were no land
16 alternatives." What do you mean by that?

17 A. To get across the river, you needed a boat to
18 get across the river.

19 Q. Okay. That's to cross the Colorado?

20 A. Right.

21 Q. Okay. If you're traveling along the Colorado,
22 it's a wide alluvial plain. You can certainly travel
23 along the stream on horseback and by wagon, so forth,
24 correct?

25 A. Certainly parallel to it, yeah.

1 Q. You had a series of slides yesterday on river
2 descriptions. Do you recall that?

3 A. I do.

4 Q. And I believe they're going to start on
5 probably about 78.

6 A. Okay.

7 Q. And I just want, I want to flip through them
8 and just identify the ones that relate in any way to the
9 upper Gila, okay?

10 A. I think each of them has the segment, it's
11 listed there.

12 Q. Okay. So as I flip through -- let's see, 78
13 and 79 don't relate to the upper. If we turn to 80, you
14 have this James Ohio Pattie description, and where do
15 you get that description from?

16 A. It actually came out of a draft document that
17 the Arizona Attorney Generals had provided with their
18 statement of facts. I don't know if that's been
19 disclosed or not, if it's a work product. And what they
20 were doing was citing to the record that are arguments
21 submitted. It's kind of pointing as in a daisy chain
22 back to something that's done there.

23 Q. Okay. And I don't think Mr. Katz wants to
24 give me his draft statement of facts just yet, so --

25 A. Probably not.

1 Q. Can you tell me what the ultimate source for
2 that is? And it sounds like maybe you can't.

3 A. Not today. I would have to pull out that
4 secret document.

5 Q. This is one statement that you're attributing
6 to all segments, and it's hard for me to evaluate that
7 when I don't know where you got this from. You must
8 have been talking about one particular place when he
9 said beautiful, running between banks with tall
10 cottonwoods and willows, plenty of beaver?

11 A. He may have been, or he may have been saying,
12 my general impression of the river was this. The way I
13 wrote it down, to me it implies that it's his general
14 impression of the river. It may not be. We can clarify
15 that.

16 Q. Okay. And again, he does talk again about the
17 tall cottonwoods which are suitable for dugout canoes,
18 correct?

19 A. Sure. Yes.

20 Q. If we go to the next slide, which is 81, we
21 have the Kearny Expedition discussion, doesn't relate to
22 Segment 1. We have a description from Johnson, 30 feet
23 wide, one foot deep on the shallows. Pebbly bed,
24 fringed with trees. Again we have trees, and what is
25 your source for this statement?

1 A. It's one of the documents describing the
2 Kearny Expedition. I'm sorry, I didn't write that down.

3 Q. Okay. And if we turn to Page 83, this is the
4 other one that you have that you corresponded with
5 segments, one of the segments in the upper Gila. We
6 have Segment 1, twelve yards wide, one and a half foot
7 deep, abounds in trout. Whose account is this?

8 A. I don't recall today. Sorry, I didn't write
9 that down.

10 Q. Those are the only ones that relate to the
11 upper Gila that you put in your PowerPoint as I read
12 your PowerPoint; is that fair?

13 A. Let me quick check.

14 Q. Sure, please.

15 A. That's correct.

16 Q. And I want to -- if you turn to Page 3-1 of
17 your upper Gila report, I realize that I misspoke
18 earlier, and I want to correct this for the record.

19 I have a nagging sense that I said that the
20 railroad was constructed in the 1860s, and it was
21 actually in the 1870s; isn't that right, Mr. Fuller?

22 A. It was in the 1870s, and I don't recall you
23 saying that it was the 1860s.

24 Q. Good. Maybe I didn't make that mistake then.

25 If we turn to Page 3-1, towards the bottom of

1 the last paragraph on the page, it says, it talks about
2 the early forms of transportation in the area. Do you
3 see that?

4 A. Okay.

5 Q. It says, "Early forms of transportation
6 included horses, mule trains, wagons, and stagecoaches,
7 and railroads to the mines began to be constructed in
8 the late 1870s," right?

9 A. Okay.

10 Q. And sort of conspicuous by its absence among
11 the early forms of transportation noted here is any form
12 of navigation of the river, correct?

13 A. It does not mention navigation of the river
14 here.

15 Q. Turning to -- let's stay in the same report
16 and turn to page 3-25. We have a block quotation from
17 Patton, and it talks about Clifton, and consistent with
18 the omission of any mention of using the stream on the
19 prior note we looked at, it says, "In the very earliest
20 days of Clifton, i.e., in the 1870s, the town had two
21 connections with the outside world. One of these was a
22 stage road to Solomonville 45 miles down the river." So
23 following the river, but not using it.

24 There was another stage road to Silver City,
25 New Mexico, a hundred miles to the southeast. So

1 according to this, there were two connections between
2 Clifton and the outside world, and neither one of them
3 was by boat, correct?

4 A. It does not mention boats in this paragraph,
5 that is correct.

6 Q. You would agree, Mr. Fuller, that we have no
7 evidence of significant commercial boating industries
8 developed on the upper Gila and San Francisco Rivers as
9 of 1912?

10 A. You asked if we have no evidence of commercial
11 boating industries developed on the upper Gila as of
12 1912; is that correct?

13 Q. Yes. Your team's words, not mine. I probably
14 wouldn't say it exactly that way.

15 A. Just reviewing what we've learned, and as I
16 sit here today, I can't recall of any industries of
17 commercial boating as of 1912.

18 Q. Question -- let's see, Page 91 of your
19 navigability PowerPoint, and this is a photo of the Gila
20 River in Duncan Valley, and do you know what date this
21 photo was taken?

22 A. I don't.

23 Q. Do you know what its source is, the source of
24 the photograph?

25 A. Hang on a second. No, I didn't write it down.

1 Q. Okay. Do you think you would be able to find
2 out and let us know?

3 A. Yes.

4 Q. Turning to Page 101 of your navigability
5 PowerPoint.

6 A. I'm not going to let you know unless I write
7 it down here, so -- sorry, go ahead.

8 Q. Page 101 of your navigability PowerPoint.
9 We're back to our good friend Pattie. And I just want
10 to point out the second sub-bullet here, 1828, eight
11 dugout canoes, comfortable descent. And it sounds like
12 we may have some discrepancies between different works
13 by Davis, but at least according to the ones that you
14 and I just went over moment ago, those eight dugout
15 canoes were on the Colorado, not on the Gila?

16 A. In the account we just read, those were on the
17 Colorado River.

18 Q. And I apologize for the repetition, but I
19 can't remember exactly what you said. The next bullet
20 where we talked about canoed from Safford to Yuma
21 several times, was that the slide where we had three
22 citations, and you think one of those will give us an
23 indication where you got that information?

24 A. Thank goodness. If you can't remember your
25 questions, I can't remember either, so I don't recall,

1 I'm sorry.

2 Q. Let me ask you differently. You're not able
3 to tell us where you got the information that he canoed
4 from Safford to Yuma several times?

5 A. I believe that comes from -- it was
6 attributed -- it was cited in Tellman's report, and I
7 think she attributes that to Davis.

8 Q. Which Tellman report?

9 A. Arizona Changing Rivers.

10 Q. And again, if that's reflected in Pattie's
11 memoirs, you're not familiar enough with his memoirs to
12 show us where that is, correct?

13 A. That's correct. I believe she was citing his
14 master's thesis, not this document here. That's my
15 recollection.

16 Q. Let's take a look at -- we're still on your
17 navigability PowerPoint. It's 115. Okay. And here
18 we're talking again about Sykes. And you have here that
19 according to Granger, Stanley Sykes of Flagstaff canoed
20 the entire length of the Gila in Arizona?

21 A. Right.

22 Q. Okay. Do you recall what the testimony was
23 about this trip back in 2005?

24 A. I don't.

25 Q. Okay. Let's take a look at the November 16th

1 transcript from the 2005 proceedings. Here we have on
2 Page 106, she's talking about Stanley Sykes. Do you see
3 at the top of the page?

4 A. Yes.

5 Q. If you go down to Line 4, "So he and his
6 friends decided to see if they could go from Phoenix to
7 Yuma by boat," and she goes -- this is Ms. Tellman
8 testifying. For the record, you can get that from Page
9 102 that she's the witness at this time. And she goes
10 on to say, "The trip was quite unsuccessful." Do you
11 see that on Line 9?

12 A. I do.

13 Q. Okay. It says, "Only one person could be in
14 the boat at the time because the other one would weigh
15 it down too much. So one person would walk along and
16 pull the boat while the other one sat in it, or
17 sometimes they both would pull the boat." Is that
18 right?

19 A. I see that she said that, yes. I have no idea
20 where she got that information. In the accounts that I
21 read, I never saw that description.

22 Q. Let's take a look at Page 28 of the Final
23 Report: Criteria for Assessing Characteristics of
24 Navigability for Small Watercourses in Arizona.

25 A. Okay.

1 Q. The second paragraph you see she's talking
2 about newspapers describing several adventuresome trips.
3 Do you see that?

4 A. I do.

5 Q. The third sentence down it says, "Godfrey
6 Sykes' brother Sidney," and I think you said
7 yesterday -- and I agree with your interpretation --
8 that's probably meant to be Stanley. Is that what you
9 said yesterday?

10 A. Yes.

11 Q. Yeah. "Built a canvas boat around 1910," and
12 again, you related it to your 1909. You thought they
13 were probably the same trip. "Which he used for an only
14 moderately successful winter low water trip down the
15 Gila from somewhere downstream of Phoenix to the
16 Colorado having to tow the boat much of the way."
17 That's what her report said?

18 A. It says that, correct.

19 Q. Okay.

20 A. Again, I'm not sure where she got that
21 statement. The accounts of that that I saw in the
22 record stated that he went from -- it was the entire
23 length. I'm not sure of her sources.

24 Q. Kino, Father Kino and his companions, the
25 other Spaniards, they navigated the Colorado; is that

1 correct?

2 A. I don't recall.

3 Q. You don't recall that? Let's take a look at
4 Page 21 -- same report, sorry. Final Report: Criteria
5 for Assessing Characteristics of Navigability for Small
6 Watercourses in Arizona. Again, this is Stantec
7 Consulting in association with J.E. Fuller and the
8 University of Arizona Water Resources Research Center.
9 On Page 21 you see Arrival of the Spaniards?

10 A. Yes, I do.

11 Q. Okay. "Several groups of Spaniards arrived by
12 sea along the California coast and the Sea of Cortez in
13 large sailing ships. They proceeded up the Colorado
14 River, probably not much farther than the mouth of the
15 Gila River in their ships or in smaller ships, boats of
16 various types, rowboats or canoes."

17 It goes on the sentence later, "The Spaniards
18 are not known to have used boats on other Arizona rivers
19 as their exploration inland was on horseback and on
20 foot." Is that what it says?

21 A. That's what it says.

22 Q. Okay. And you're familiar with Kino and his
23 group exploring parts of the Gila, the Santa Cruz, and
24 the San Pedro over a period of time?

25 A. Vaguely, yeah.

1 Q. Okay. And unlike the Colorado, there's no
2 evidence that they navigated any of those other streams,
3 true?

4 A. That's what it says here.

5 Q. You don't have any evidence to the contrary,
6 correct?

7 A. No. If I did, it would have been in my
8 accounts that I put in yesterday.

9 Q. Let's turn to, back to your upper Gila report,
10 please. On Page 8-2, it's true that the American
11 military expedition of Stephen Watts Kearny and William
12 Emory in 1846 included explorations of the upper Gila
13 and San Francisco; is that right?

14 A. Yes, it is.

15 Q. And there's no record of them using the stream
16 for transportation or for shipping or for any other
17 purpose; is that right?

18 A. There's no record of them using the stream for
19 boating other than anything I might have said otherwise.
20 But in this sentence, it does not describe them using
21 any boats on the river. They may have -- you said or
22 any other purpose.

23 Q. Okay.

24 A. So kind of open-ended sort thing.

25 Q. If you had any accounts of them using the

1 river for boating, they'd be in your report, and we
2 would have heard about them yesterday, correct?

3 A. That's correct.

4 Q. Same thing, same sentence here. They're
5 talking about Bartlett's Boundary Survey. Again,
6 there's no record of him using the stream for travel?

7 A. I would refer back to my presentation
8 yesterday. Those are the accounts of boating that I'm
9 aware of.

10 Q. And in fact, Bartlett, he recounted that his
11 belief was that the Gila was not navigable, true?

12 A. I believe he also said that it was navigable,
13 too. He earlier said that it was navigable, and then
14 later said that it was not.

15 Q. Okay. Well, let's just look at what's in your
16 report, Page 8-4. First full paragraph, "Early
17 descriptions of the upper Gila and San Francisco Rivers
18 do not differ significantly from contemporary
19 descriptions of the rivers. Bartlett, 1854, believed
20 that the Gila River was not navigable except during
21 irregular floods." Is that right?

22 A. That's what it says here.

23 Q. And, of course, irregular floods would not be
24 part of the natural or ordinary condition of the river?

25 A. I would agree with that.

1 Q. Turn, if you would, please to -- we're on your
2 navigability PowerPoint, please. And we're on -- if you
3 could turn, please, to slide 152. Okay. And here,
4 you're talking about Mr. Burtell's reconstructive flow
5 of the upper Gila; is that right?

6 A. Yes, that's correct.

7 Q. And for Segment 1 you say 1.7 to 1.8 feet
8 hydraulic depth at Virden, correct?

9 A. That's correct.

10 Q. And we can cross-reference with Mr. Burtell's
11 report at Table 10, if you like. But if you recall, he
12 actually stated his depths as a maximum, correct? So he
13 said less than 1.7, for instance?

14 A. He did.

15 Q. Is that true?

16 A. I believe that's right. Let me just
17 double-check.

18 Q. Again, it's Table 10.

19 A. Yeah.

20 Q. So his depth for Virden is less than 1.7, less
21 than 1.8, so forth, correct?

22 A. For his mean depth, yes.

23 Q. Okay. And then if we look at -- let's take a
24 look at the Clifton numbers that you have here. For
25 Clifton, you say 1.5 to 2.5, is that right, on your

1 slide?

2 A. Yes.

3 Q. And I think that might have accidentally been
4 pulled out of the average velocity row from
5 Mr. Burtell's table. He actually shows less than two
6 feet.

7 A. You're correct.

8 Q. And a similar thing, I think just the wrong
9 row was referenced for, let's see, for Bonita. Again,
10 it doesn't say 2.5. It's actually the depth for below
11 Bonita Creek is 1.1 to 2.2, and 1.5 to 2.5; is that
12 right?

13 A. You're correct.

14 Q. Okay. On slide 194 of your PowerPoints.
15 Okay. You're talking here about Jon Colby who testified
16 back in 2005, and it says he ran this Cimarron
17 Adventures and Gila Box for 17 years, recently stopped.
18 Do you know when he discontinued that operation in Gila
19 Box?

20 A. No, I don't know the exact date. But it was
21 recent, according to the conversation that was related
22 to me from Cheryl Doyle at the Land Department.

23 Q. When was that conversation with Ms. Doyle?

24 A. May 28th, this year.

25 Q. Sir, if you would please turn to 156 on the

1 same PowerPoint. We're on the navigation PowerPoint.
2 And I just want to make sure I understand. I think I
3 do. But when you're suggesting that a certain
4 watercraft can be boated at a certain flow level, it's
5 based on depth that you're relating back to the
6 recreational watercraft federal standards that we talked
7 about a little bit earlier; is that correct?

8 A. That's correct.

9 Q. And if we turn --

10 A. In part. So that's one of the sources I used.
11 I also used my own personal experience in boating as
12 well.

13 Q. Well, do you ever make a determination that a
14 boat could be used on a particular depth that's
15 inconsistent with that federal recreational standard?

16 A. I was speaking in terms of the flow rate as
17 they relate to those depths, so --

18 Q. Okay. But ultimately the depths you're
19 relating back to that federal recreational standard?

20 A. Yes.

21 Q. If we turn to Page 164.

22 A. Yes.

23 Q. Okay. You have a dotted line there that I
24 don't have on what was sent around to the parties last
25 week. And so I just -- I wasn't really clear on exactly

1 what that dashed line is. It looks like a flow duration
2 curve that isn't on this one, on my copy.

3 A. It's not a flow duration curve. It's --
4 hopefully, I got this one right. This was Mr. Burtell's
5 reconstructed median monthly flows.

6 Q. Okay. And this is for Segment 3?

7 A. Correct.

8 Q. Okay. And if we turn to Page 167 on the same
9 PowerPoint, does that appear again here, Mr. Burtell's
10 median flow?

11 A. It is also from his report. They look like
12 they're different. They're different, so probably using
13 a different reach.

14 Q. Okay. And what about slide 172?

15 A. That looks like it's using the same as the one
16 you just asked me about for Segment 4.

17 Q. And it's from Mr. Burtell's report?

18 A. That's right.

19 Q. He didn't look at Segment No. 5; is that
20 right?

21 A. No, but I believe he -- this is the data that
22 you had mentioned earlier that it's downstream of the
23 reach you're concerned about, but it applies to that
24 reach.

25 Q. I think actually that would be reach No. 4,

1 right, the data just below?

2 A. Correct.

3 Q. Right. So I skipped over that one because
4 that does probably relate to actual data that
5 Mr. Burtell looked at.

6 Segment 5 you superimposed calculations from
7 Mr. Burtell for a reach he didn't look at, true?

8 A. Correct. The drainage there is not
9 significantly different and the source of flow was
10 basically from Segment 4.

11 Q. So you superimposed Mr. Burtell's data from
12 Segment 4 onto Segment 5?

13 A. I have.

14 Q. And did you do -- what data did you use for
15 Segment 6, which is a couple slides later?

16 A. That's on slide 177. And that's just a
17 generalized average monthly flow. I'm just trying to
18 show the seasonal fluctuation at that point. I don't
19 have any monthly median flow rates for that segment.

20 Q. Do you agree, Mr. Fuller, that commercial
21 recreational rafting did not really get started until
22 the 1930s?

23 A. Commercial recreational rafting?

24 Q. Yeah. Again, your team's words. Not mine.
25 We can go to the report, if it's easier.

1 A. Show me where that is in the report.

2 Q. Sure. Let's take a look again at the Final
3 Report: Criteria for Assessing Characteristics of
4 Navigability for Small Watercourses in Arizona, and this
5 is on Page 32.

6 And about two-thirds of the way down there's a
7 heading in italics, *Recreational Boating After World War*
8 *II*; do you see that?

9 A. Yes, I do.

10 Q. And it goes on to say, "Commercial
11 recreational rafting started in the 1930s." Is that
12 right?

13 A. Yes. This is referring to use of inflatable
14 rafts on big rivers.

15 Q. Okay. Well, it's talking about more than
16 inflatable rafts, isn't it, because it says, "The
17 development of durable, small boats, plastic, fiberglass
18 and other modern types of canoes and kayaks, inflatable
19 boats for single paddlers and for groups, all
20 contributed to the rising popularity of river running in
21 Arizona, especially on rivers not previously considered
22 boatable or boatable only very rarely because of low
23 water." Is that what it says?

24 A. Yes, that is what it says.

25 Q. And in fact, it also says that while

1 commercial recreational rafting started in the 1930s, it
2 developed in the 1970s; is that right?

3 A. Yeah, I'm not sure what the person who wrote
4 this -- this is probably Barbara Tellman's work -- what
5 exactly she meant by that.

6 Q. And it's talking about developed in the 1970s
7 on the Colorado River, correct?

8 A. Yeah.

9 Q. And later on the Salt, Gila and Verde Rivers;
10 is that right?

11 A. In terms of commercial, popular commercial on
12 those particular rivers, that's the statement that she
13 makes right here. Factually, I'm not sure that's
14 correct, nor do I think that -- well, there was
15 commercial recreational traffic on the Colorado River
16 through the Grand Canyon as early as 1910. So I think
17 she's talking about in general when it became a much
18 larger industry.

19 Q. Let's take a look, this is sort of a similar
20 statement here on Page 33. Same report. Under the
21 Conclusions section. And this is in the report prepared
22 by your team. This isn't from a newspaper editor. It
23 says, "Some daring adventurers traveled on the Gila and
24 other rivers throughout the historic period, but rivers
25 were not generally used for recreational travel until

1 the development of new materials, such as fiberglass and
2 artificial rubber after World War II." Is that what it
3 says?

4 A. Yeah. Just to clarify, I was not the editor
5 or lead author on this report, so those are not words I
6 would have chosen, particularly in light of how those
7 adjectives have been repeated far more than the original
8 adventurers did themselves. It says, "Some daring
9 adventurers traveled on the Gila and other rivers
10 throughout the historic period, but the rivers are not
11 generally used for recreational travel" -- I think by
12 generally, they mean popularly -- "until the development
13 of new materials, such as fiberglass." And I've got to
14 tell you that fiberglass is not a particularly durable
15 material. It's subject to shattering. "And artificial
16 rubber after World War II." And that's also an
17 incorrect statement regarding the kind of rubber that
18 was available, and I presented that information
19 yesterday.

20 Q. Did you review the work by Ms. Tellman and the
21 rest of the team before it was published as a final
22 report submitted to this Commission?

23 A. I was not a project manager for this. I
24 was -- participated in certain parts of it.

25 Q. The front page says Stantec Consulting in

1 association with J.E. Fuller; isn't that right?

2 A. It does.

3 Q. Okay. So do you also take issue with the
4 statement in your report that a river that is boatable
5 by neoprene raft or fiberglass canoe may not be boatable
6 by wooden rowboats, for example? Is that okay, or do
7 you have a problem with that as well?

8 A. It depends on the wooden rowboat.

9 Q. Do you agree, Mr. Fuller, that as of the date
10 of statehood, the upper Gila River consisted of a wide,
11 braided flood channel?

12 A. On the date of statehood there are portions of
13 the upper Gila River that probably had a wide, braided
14 flood channel, correct.

15 Q. And that at least some of the braided
16 condition resulted from flooding that occurred in 1905
17 and 1906; is that right?

18 A. Yeah. As I pointed out yesterday, the
19 braiding that they're talking about really is irrelevant
20 to navigability. It's not --

21 Q. That's not my question. That's not my
22 question.

23 A. That's my answer though.

24 Q. My question is, my question is, the braiding
25 that is described in the upper Gila River as of the date

1 of statehood is the result of floods in 1905 and 1906,
2 correct?

3 A. The braiding of the flood channel is a result
4 of floods, sure.

5 Q. And that is a natural condition of the river,
6 just like it is of any river, right?

7 A. The braided flood channel is a natural
8 condition of the river. You might get a little bit of
9 argument on that, but that -- there were human
10 influences on that. But sure, flood channel can be
11 braided naturally, sure.

12 Q. If you disagree with this or don't remember,
13 we can go back to the transcript. Do you remember in
14 2005 Mr. Huckleberry testified that flooding has a much
15 greater impact on the geomorphology of the stream
16 channel and the stream channel's geometry than does any
17 impact by man?

18 A. Yeah, but Gary was talking about, Gary
19 Huckleberry was talking about the flood channel then.

20 Q. That's my question. I'm asking if you agree
21 with that statement. That floods have more of an impact
22 on the channel than do diversions?

23 A. In some cases, that's true. It's not a
24 uniformly true statement.

25 Q. Let's go to the transcript from November 16th,

1 Page 94. And you can see middle of the page -- this is
2 Mr. Huckleberry answering questions, right?

3 A. Yes.

4 Q. And it should actually be Dr. Huckleberry
5 there?

6 A. Yes, it is.

7 Q. Not my mistake. It's in the transcript.
8 Bottom of that page, the question is, "And I was
9 curious, in the discussion that has been going on
10 regarding the effect of diversions on the river, on how
11 you might compare the impact on the river channel of
12 diversions? In other words, the effect of diversions
13 versus the effects of floods on -- and of course, I'm
14 thinking of the period from about, what, 1905 up through
15 and including statehood?"

16 CHAIRMAN NOBLE: Mr. Hood, could you slow down
17 just a little bit?

18 MR. HOOD: I sure could.

19 CHAIRMAN NOBLE: Thank you.

20 BY MR. HOOD:

21 Q. The answer is, "That is a very good question.
22 My feeling is that in terms of channel changes in the
23 floodplain, the floods have a much greater impact on the
24 morphology of that channel than the diversions do." Is
25 that what it says?

1 A. That is what it says.

2 Q. Then it goes on to say, "In terms of the
3 overall geometry of the floodplain, and particularly the
4 flood channels, it's the floods that have the greatest
5 impact." Is that what it says?

6 A. Yes, and you notice emphasis on floodplains
7 and flood channels.

8 Q. Do you agree, Mr. Fuller, that the
9 geomorphology of the upper Gila is substantially
10 unchanged from its condition at or before statehood?

11 A. The geomorphology of the upper Gila is
12 substantially unchanged? I believe you're citing a line
13 from the upper Gila report, and it's important to note
14 the distinction between the boundaries of that report
15 and the upper Gila, as you've defined it for our
16 discussion today. And I think that's a pretty true
17 statement for the boundaries of the upper Gila report
18 which went from Gila Box up to the New Mexico line. I
19 would say as applied to the reach downstream of the Gila
20 Box, not so much.

21 Q. So you would agree with that as it relates to
22 the area upstream of the Safford Valley?

23 A. Right, in terms of the geomorphology, and by
24 that what I meant was the basic channel, low flow
25 channel conditions.

1 MR. HOOD: That's all I have. Thank you,
2 Mr. Fuller. Appreciate it.

3 THE WITNESS: You're welcome.

4 CHAIRMAN NOBLE: Who is next? Mr. McGinnis?

5 MR. MCGINNIS: Yes, sir.

6 CHAIRMAN NOBLE: If you'll give Mr. Hood just
7 a moment, he'll bring his cart up. And we're going to
8 take a break for ten minutes.

9 (Recessed from 11:10 a.m. to 11:19 a.m.)

10 CHAIRMAN NOBLE: Let's begin.

11 MR. MCGINNIS: Thank you, Mr. Chairman. Mark
12 McGinnis for the Salt River Project.

13

14 CROSS-EXAMINATION

15 BY MR. MCGINNIS:

16 Q. Mr. Fuller, I'd like to start up where
17 Mr. Hood left off. He was asking you right before you
18 finished some questions about Mr. Huckleberry's
19 testimony from 2005 regarding impacts of floods on the
20 channel. Do you recall that testimony?

21 A. I do.

22 Q. And my understanding, best I could write down
23 while you were talking, was that you at the end of your
24 answer said, "Gary, Mr. Huckleberry, was emphasizing the
25 floodplain and the flood channel." Do you recall saying

1 that?

2 A. I do.

3 Q. Do you recall your testimony in 2005 where you
4 talked about the shape of the low flow channel and the
5 location of the low flow channel being altered by
6 floods?

7 A. I don't.

8 Q. Okay. I have -- there in front of you is a
9 copy of the transcript. It's a little different,
10 different copy than what Mr. Hood had, but hopefully
11 it's the same thing. Move to the November 16th
12 transcript from 2005, Page 61. Page 61, this is you
13 testifying, right?

14 A. Yes, it is.

15 Q. On Line 18 it says, "We do find that flood
16 impacts are significant to this river. It does change
17 the shape and the location of the low flow channel as
18 well as flood channel." Do you see that?

19 A. Yes.

20 Q. And that's your testimony from back in 2005?

21 A. Yes, it is.

22 Q. And you did testify back at the experience we
23 all had in 2005 out at the LaQuinta on this river; do
24 you remember that?

25 A. Yes.

1 Q. Okay. At the hotel. Would you agree with me
2 that the character and nature of your testimony
3 yesterday was somewhat different than it was back in
4 2005?

5 A. No, not that I recall.

6 Q. Do you recall --

7 A. Well, I am offering a specific opinion. Is
8 that what you're getting at?

9 Q. That was one of the things I was getting at.

10 A. Yeah.

11 Q. And Mr. Hood covered a little bit this
12 morning -- do you recall back in 2005 being reluctant to
13 give an opinion about whether any portion of the river
14 was navigable?

15 A. Yes.

16 Q. And you recall the very -- toward the very end
17 of your testimony, Mr. Helm asked you some very pointed
18 questions that finally got you to say you had an opinion
19 about a particular reach of the lower Gila?

20 A. That's correct.

21 Q. And then yesterday, you testified here
22 relatively zealously that every inch of the Gila from
23 New Mexico all the way to California was navigable,
24 right?

25 A. Well, zealously is your adjective, but that is

1 my opinion, that the Gila River is navigable.

2 Q. What made the -- what made the change? Why
3 are you different this time than you were last time?

4 A. The difference is in what I was hired to do.
5 Last time, Land Department, when they hired me, said
6 that I was to present the facts regarding the
7 characteristics of the river and that their opinion was
8 the Commission would make this decision.

9 Q. Did you have different instructions this time?

10 A. This time the State has filed an opinion that
11 the river is navigable, and we are here to support that
12 opinion.

13 Q. So you would agree with me that you are more
14 of an advocate this time than you were last time?

15 A. I am advocating for navigability this time,
16 that's correct; but as Mr. Katz pointed out, and
17 Mr. Hood as well, we have not advocated for navigability
18 of all river segments. So we've been selective based on
19 the facts.

20 Q. And another difference between the last time
21 and this time is last time you had a whole team of
22 people who testified at the hearing, right?

23 A. We did have more people testify.

24 Q. Dr. -- Mr. Gilpin testified; do you remember
25 that?

1 A. Mr. Gilpin, and yes, he did testify.

2 Q. And he testified about historical issues?

3 A. Yes.

4 Q. And we already talked about Mr. or

5 Dr. Huckleberry testified last time?

6 A. Dr. Huckleberry.

7 Q. Dr. Huckleberry. What did he talk about; do
8 you remember?

9 A. He was just talking about the geomorphology of
10 the middle Gila, the middle and lower Gila.

11 Q. And Ms. Tellman testified last time as well?

12 A. Correct.

13 Q. And she talked about boating, right?

14 A. She did.

15 Q. So another difference between last time and
16 this time is last time you had four different people
17 testifying. This time you're talking about everything?

18 A. That's correct.

19 Q. And you don't have any training or education
20 in history, do you?

21 A. I have a lot of history with this project,
22 that's for sure. And I certainly took history classes
23 in college. I am not certified by anybody as a
24 historian. I think there are a fair number of people
25 that would argue that geology is a discipline of

1 history. But I am not a registered historian, if that's
2 the question.

3 Q. So when you were in college doing your degree
4 in geology and then your master's in geoscience, did you
5 take any courses that talked specifically about how one
6 views and analyzes and interprets historical documents?

7 A. It's been a long time since I was in college.
8 Yeah, I would imagine that our history classes did go
9 over that kind of interpreting historical data. I took
10 a number of history classes as an undergraduate. But
11 I'm willing to concede that I am -- my profession is not
12 listed as historian.

13 Q. And you talked some yesterday about
14 interpretations of various court decisions. Do you have
15 any legal training?

16 A. No.

17 Q. Are you glad about that?

18 You also talked quite a bit yesterday about
19 your personal experience in boating; is that right?

20 A. I did.

21 Q. And you've got a lot of experience. Do you
22 consider yourself a pretty well-qualified boater?

23 A. Better than some, not as good as some.

24 Q. Okay. On a scale of say 1 to 100 where 1 is
25 somebody who has never been in a boat and 100 is one of

1 those guys on the Olympics that run the slalom course in
2 the whitewater, where are you?

3 A. Going to depend on the boat type. As a solo
4 canoeist, I'd probably put myself in the 65 range. As a
5 whitewater rafter -- I don't know -- 50. As a kayaker,
6 50.

7 Q. Do you consider your personal boating skills
8 part of the standard that you incorporate into your
9 opinion about what's navigable or not?

10 A. As part of the standard of what I consider?
11 I'm not sure about the word "standard" and how you mean
12 that. I would say that I do consider my personal
13 experience sitting in a boat. That helps me tell what's
14 boatable and what's not boatable.

15 Q. So would you say a river is navigable if Jon
16 Fuller could have boated it?

17 A. A river is navigable if Jon Fuller could have
18 boated it? It's hard to apply that to any river
19 anywhere. I do believe that based on the
20 reconstructions that I've seen that I could have boated
21 the Gila River, and I also believe that the river is
22 navigable. So those -- a Venn diagram of those two sets
23 overlap. I'm not sure that's a hard and fast rule.

24 Q. Are there certain rivers that you with your
25 experience could boat that somebody with less experience

1 maybe couldn't boat?

2 A. Sure.

3 Q. Would you consider those rivers less navigable
4 than a river that that person could have boated?

5 A. I want to put a little asterisk next to this,
6 because we're talking hypothetically. It would be
7 better to have this conversation regarding a specific
8 river and its specific characteristics. But it is
9 possible -- now I've lost your question. But I think
10 that you asked me whether it's possible I would consider
11 a river navigable that someone else could not boat or
12 would not be able to boat. I can't think of any
13 offhand. By not being able to boat, what do you mean by
14 that? That they would be unable to learn how to boat
15 it? They would be unable to develop the skills to do
16 it?

17 Q. Couldn't successfully go down from one end of
18 the river to the other on the first try. That's what
19 I'm asking in this question.

20 A. I'm not trying to be difficult, but what do
21 you mean by "successfully"?

22 Q. Get down to the other end in the water.

23 A. No, I don't think so.

24 Q. So does the skill of the boater play into your
25 impression and definition of what's navigable and what's

1 not?

2 A. It plays into it. I wouldn't say it's the
3 defining characteristic, but certainly there is a skill
4 element -- as I pointed out in my slides yesterday,
5 there is a skill element to boating rivers, much as
6 there is a skill element to driving a car or pretty much
7 any other thing we do.

8 Q. And for purposes of applying the legal test of
9 navigability to the Gila River, what level of skill did
10 you assume a boater would have?

11 A. A novice.

12 Q. So somebody who had never boated before has to
13 be able to boat the river in order for you to believe
14 it's navigable?

15 A. Never boated before, has to be able to -- no,
16 I don't think I said that someone who has never. I said
17 a novice boater. So you'd have to have some
18 understanding of how to sit in your boat, how to load
19 your boat, how to hold a paddle. I mean, there are some
20 basic skills that you would need, and the fewer of those
21 skills that you have, the tougher time you would have
22 getting down the river.

23 Q. And you obviously have boated lots of
24 different rivers, right?

25 A. I have.

1 Q. And in other different states, I assume?

2 A. I have.

3 Q. And you understand that the outcome of a
4 particular determination of navigability on a particular
5 river could have an impact on the accessibility of those
6 rivers for boating, right?

7 A. Well, I would hope that the boaters would
8 continue to be able to boat rivers, if that's what
9 you're asking me. But I'm not exactly sure how that
10 would play out.

11 Q. You understand -- you're aware, aren't you,
12 that some of the concerns that boaters have about
13 private ownership along stream beds are things like
14 barbed wire fences going across the river, things like
15 that, right?

16 A. Yes, I've heard that concern voiced.

17 Q. And you understand, don't you, that if the
18 State owned the riverbed, the private property owners
19 might not be able to put up those barbed wire fences,
20 right?

21 A. They might not, I suppose.

22 Q. And so people like you who like to boat the
23 rivers could have more access to the rivers based upon
24 the determination of navigability, right?

25 A. I suppose that's possible.

1 Q. And that includes you personally?

2 A. Yes.

3 Q. Mr. Katz asked you a question yesterday going
4 back to the '90s about whether the State Land Department
5 gave you any instructions at that time about what your
6 findings should be. Do you recall that?

7 A. I do.

8 Q. And your answer was very specific, and you
9 said, "Nobody from the Land Department told me that."
10 Do you recall that?

11 A. Vaguely.

12 Q. Was there anybody else at that time that told
13 you what your findings would be -- should be?

14 MR. KATZ: Are we talking in reference to
15 navigability?

16 MR. MCGINNIS: I'm talking in reference to the
17 question you asked him yesterday.

18 THE WITNESS: So the question that you asked
19 me was, did anyone --

20 BY MR. MCGINNIS:

21 Q. Back in the '90s.

22 A. -- tell me what the decision should be,
23 whether navigable or nonnavigable? I think there were
24 lots of voices saying yes, no, yes, no, yes, no. But
25 certainly nobody at the Land Department or AG's Office

1 or the State didn't direct me one direction, one way or
2 the other.

3 Q. And you testified, I think yesterday, that you
4 came to the opinion that the San Pedro River and the
5 Santa Cruz River should be navigable, right?

6 A. Should be navigable?

7 Q. Are navigable.

8 A. No, wait. You said that I came to the
9 conclusion that the San Pedro and Santa Cruz are
10 navigable?

11 Q. Yes.

12 A. No, I did not.

13 Q. Okay. You didn't testify yesterday that you
14 believed that the San Pedro and the Santa Cruz in the
15 ordinary -- in their ordinary and natural condition were
16 susceptible to navigability?

17 A. Yeah, no, that's not what I testified
18 yesterday.

19 Q. Okay. Do you have an opinion about whether
20 the San Pedro River is navigable under the standards
21 that you applied to the Gila?

22 A. Yeah, I'm not here to discuss the San Pedro
23 today.

24 Q. Okay. I asked you a question. Could you
25 answer it? I think you answered it already, but maybe I

1 misunderstood your answer?

2 A. Yeah, my recommendation to the Land Department
3 was -- and they are free to choose whatever they choose.
4 But my recommendation was not to pursue a finding of
5 navigability for either of those two rivers.

6 Q. Okay. Both of those rivers, the San Pedro and
7 the Santa Cruz, are tributaries to the Gila, right?

8 A. They are.

9 Q. Okay. Are you familiar with the confluence of
10 the San Pedro and the Gila?

11 A. Yes.

12 Q. Are there characteristics of the San Pedro
13 just upstream from that confluence that are different
14 from the characteristics of the Gila at that confluence
15 that would make it less likely to be navigable?

16 A. Are there characteristics -- I'm sorry, there
17 was a lot of stuff in there. So the characteristics of
18 the San Pedro River just upstream of the confluence that
19 are different from the Gila River. The answer to that
20 is yes. Certainly today it's very different.

21 Q. Okay. In its ordinary and natural condition,
22 were there differences between the San Pedro at the
23 confluence and the Gila at that same confluence that
24 would make one river navigable and the other not?

25 A. Again, I'm surprised at being asked to answer

1 questions about the San Pedro River. I'm not really
2 prepared.

3 Q. Well --

4 A. You know, I'm going to have to take a pass on
5 that. The rivers are different. There are different
6 characteristics. I do believe the Gila River to be San
7 Pedro -- the Gila River to be navigable. And it was my
8 opinion that the San Pedro was not.

9 Q. But as you sit here today, you can't tell me
10 why the difference between those two exist?

11 A. Why the difference between the San -- why the
12 San Pedro River is different from the Gila River, or why
13 my opinion about them is different?

14 Q. In terms of navigability why your opinion is
15 different between those two rivers that meet each other?

16 A. Yeah. Yes, I could. We could spend a long
17 time talking about those differences. I'm not sure how
18 it's relevant to the Gila, but -- I'm just not sure why
19 it's relevant to the Gila, the San Pedro. Am I required
20 to answer this question?

21 CHAIRMAN NOBLE: We would like you to.

22 THE WITNESS: I'm not sure that was a yes.

23 CHAIRMAN NOBLE: The answer is yes.

24 THE WITNESS: All right. The San Pedro River
25 has a smaller watershed. It has lesser flow. It has a

1 different history in terms of its use. It has a
2 different seasonality of flow. The flow depths are
3 generally less. It certainly has a more complex history
4 of what the ordinary and natural condition would be.
5 There's lots of scientific arguments about the role of
6 arroyo-cutting and whether that's human caused or not
7 human caused. Boiling it down to hopefully as short an
8 answer as we can possibly get, let's just say less flow,
9 lower depths.

10 BY MR. MCGINNIS:

11 Q. If I asked you the same question about the
12 Santa Cruz, would your answer be generally the same?

13 A. The Santa Cruz, you're asking specifically to
14 the confluence area?

15 Q. The Santa Cruz near the confluence with the
16 Gila in the ordinary and natural condition of both
17 rivers.

18 A. Yeah, it's my understanding that the Santa
19 Cruz almost never flows to the Gila River.

20 Q. Okay.

21 A. Continuously.

22 Q. My question is --

23 A. So in the confluence area, almost never any
24 runoff.

25 Q. And my question was in its ordinary and

1 natural condition; did you understand that?

2 A. Yes.

3 Q. And your answer is the same?

4 A. Yeah.

5 Q. You talked about early yesterday morning or at
6 some point yesterday morning, and my understanding was
7 that you said the differences in drafts of boats between
8 modern-day boats and boats from the 1800s, the
9 differences in drafts weren't much.

10 A. That's correct.

11 Q. Do you recall that?

12 A. Yes.

13 Q. What are the differences between modern-day
14 boats that you use, for example, today in your canoeing
15 and a boat that was available in 1860?

16 A. There were specific slides that addressed
17 that, but from recollection, the main differences are
18 with regard to the materials that are used. We now have
19 materials that didn't exist back then. And durability.
20 So some of the materials we use today are more durable
21 than some of the materials that were available in 1912.

22 Q. You had some testimony yesterday where you did
23 an analogy between boating on the Gila in the 1800s and
24 driving on the U.S. 60 today. Do you recall that?

25 A. Yes.

1 Q. And my understanding is, you weren't trying to
2 equate the frequency and number of occurrences of people
3 who drive on the U.S. 60 today with the occurrences that
4 happened in the 1800s with boating on the Gila, right?

5 A. I think if you live in the East Valley, you
6 probably recognize that there are a few more people on
7 the U.S. 60 than you see on the river.

8 Q. I do live in the East Valley.

9 A. An easier drive.

10 Q. And you talked some about the Apache threat
11 yesterday being a reason why people maybe didn't boat on
12 the Gila River; do you recall that?

13 A. I do.

14 Q. Do you know if the Apaches were on the lower
15 Gila down between the Salt River confluence and Yuma?

16 A. They were dominantly in the upper Gila area.

17 Q. Several times yesterday in your discussion
18 with Mr. Katz you used the term "boatable." Do you
19 recall that?

20 A. I do.

21 Q. Do you make a distinction between "navigable"
22 and "boatable"?

23 A. Thinking back as to how I used the word
24 yesterday -- I think folks in your profession may think
25 of those terms differently. I'm generally using them

1 synonymously.

2 Q. So anything you can float a boat on is
3 navigable; is that what your opinion is?

4 A. No, I wouldn't necessarily say that. I'm
5 saying I tend to use the words interchangeably.

6 Q. Several times in your discussions yesterday
7 with Mr. Katz, you were talking about particular boating
8 accounts. And you said in your response, nobody died.
9 Do you recall that?

10 A. I do.

11 Q. Is that part of your definition of what a
12 successful boating trip is?

13 A. Yes.

14 Q. Is that sort of a minimum standard in your
15 account?

16 A. It was one of the standards.

17 Q. Yesterday afternoon you said -- and I tried to
18 write down the quote -- and you were talking about
19 modern boating. You said, "If there's water and you can
20 get there, people will boat it."

21 A. Yes.

22 Q. Do you remember saying that?

23 A. Yes.

24 Q. And you're talking there about modern times?

25 A. Yes.

1 Q. Okay. Yet when you talked about the 1800s,
2 you had several slides that explained why people
3 wouldn't boat even if there was water there. Do you
4 recall that?

5 A. I do.

6 Q. Do you have any reason for why people would
7 boat anyplace there's water in 2014, and they wouldn't
8 boat if there was water there back in 1860?

9 A. Primarily, they have a lot more time.

10 Q. So you're thinking about recreational boating?

11 A. Yeah. The comment regarding if there's water
12 there, people will put a boat in it, it's just a
13 reflection on my observation of looking at a lot of wet
14 places in Arizona, and people have found ways to throw a
15 boat in there for whatever reason.

16 Q. But you don't think that was true, say, in the
17 late 1800s?

18 A. Well, it was less true in the sense that there
19 were less people there. And I would imagine pioneer
20 Arizona was a little different in terms of availability
21 of funds and time to do things like that.

22 Q. But we've seen in some of the documents though
23 that those people had -- the folks in the 1800s had some
24 recreational activities, right?

25 A. They did.

1 Q. They fished?

2 A. Yeah.

3 Q. Right? There's no reason that you think they
4 wouldn't have boated if they could have, is there?

5 A. Again, I believe that argument of if they
6 could have, they would have applies to some people. So
7 we're kind of looking at the same thing from different
8 angles. I'm saying you're going to find some segment of
9 the population that will use rivers as long as there's
10 water and a gate that let's them in there. And other
11 folks who will choose not to boat for a variety of
12 reasons that have nothing to do with whether the river
13 is wet or not.

14 Q. Again, I understand that. What I'm trying to
15 get at is, do you believe that the segment of population
16 that would boat if they had the opportunity didn't exist
17 in the 1800s in Arizona?

18 A. Oh, I don't know that.

19 Q. You talked some yesterday -- and I can't
20 remember which segment. It was Segment 3 or 4. You
21 talked some about the reach between Coolidge Dam and
22 Ashurst-Hayden. Do you recall that?

23 A. I do.

24 Q. Would you agree with me that that reach has
25 flows that are not in their natural condition?

1 A. The hydrology of that reach has certainly
2 changed from its ordinary and natural condition. There
3 are times when the flows mimic that which occurred in
4 the ordinary and natural condition; but as a general
5 rule over the year, yes, the distribution of flow has
6 changed significantly in that reach.

7 Q. And wouldn't you agree with me that there are
8 certain times of the year, at least, where the flows
9 between Coolidge Dam and Ashurst-Hayden are more regular
10 and more predictable than they would have been under
11 natural conditions?

12 A. Can we go to the chart there for that segment,
13 and that will help me answer that question.

14 In this chart --

15 Q. Which slide is that, Jon?

16 A. I'm sorry, slide 167 from the Gila
17 navigability, the Gila River presentation. It's titled
18 Gila River Segment 4 Historical Boatable Flow Range.
19 And you can see the distinction in the hydrology -- I
20 lost my pointer here -- between the two dashed lines.
21 And there is a time of the year, if you look at the gage
22 data, which is the -- I can point with my mouse. Here
23 we go.

24 This line right here is from the modern gage
25 record, and this line right here is from the

1 reconstructed flow that Mr. Burtell put together. And
2 you can see there's a differential there. I'm sure
3 that's the time period when the flow is elevated now
4 above its historic -- its reconstructed historic time.

5 Q. Because part of the function of Coolidge Dam
6 is to store water during the flood flows and let it out
7 gradually over time, right?

8 A. That's correct.

9 Q. So would you agree with me that at least part
10 of the year that segment is more navigable than it would
11 have been under ordinary and natural conditions?

12 A. I would say the flow depths, the flow depths
13 were greater during that time of the year. At that
14 point it's kind of like -- I don't know what a good
15 analogy would be. Is two cookies better than one
16 cookie? It was navigable at either flow rate.

17 Q. Would it have been easier to navigate under
18 the artificial conditions now though, right?

19 A. I don't think so. I think it would be about
20 the same.

21 Q. But I thought you said in your testimony
22 yesterday, and some today, that it's all about depth,
23 right?

24 A. I did say that yesterday. It's all about
25 depth.

1 Q. And wouldn't the depth of that stretch from
2 Coolidge Dam to Ashurst-Hayden during the part of the
3 year when they were releasing water out of Coolidge Dam,
4 wouldn't it be deeper than it would be under natural
5 conditions?

6 A. In that particular time frame that my mouse is
7 still pointing at, yeah, there's a period of time where
8 there would be slightly greater depths. However, it
9 would be, it would be like saying the Colorado River is
10 more navigable because the depth was 4.2 feet instead of
11 4.1 feet. It may be that trivial of difference in the
12 depth, and from a low draft boating standpoint, it would
13 be an insignificant difference. I'll grant you that the
14 water would be deeper, in all likelihood. That doesn't
15 necessarily make it easier. It may be just about the
16 same, may be just about the same.

17 Q. Maybe I misunderstood this. I thought when
18 you were talking to Mr. Hood this morning, you said
19 there was a distinction between three inches of flow and
20 six inches of flow. Do you remember that discussion
21 about the draft?

22 A. I do.

23 Q. Okay. So now you're saying that a tenth of an
24 inch or something along that magnitude is insignificant?

25 A. The discussion I was having with Mr. Hood

1 related to the low end of boating. Now we're talking
2 about something that's above those thresholds.

3 And just one more clarification on "It's all
4 about depth." That statement was made relevant to or
5 relating to susceptibility, and, of course, there are
6 other factors that go into determining whether a river
7 is navigable or not besides depth.

8 Q. The river at Niagara Falls is probably pretty
9 deep, right?

10 A. Yes, it is.

11 Q. And unless you're in a barrel, you're probably
12 not navigating it?

13 A. That's true.

14 Q. What are the other factors other than depth
15 that you would consider?

16 A. Well, the presence of a world-class, largest
17 waterfall would be a factor.

18 Q. How about boulders in the river, would that be
19 a factor?

20 A. It would depend on the number of boulders. So
21 a boulder in the river, no, you boat around it. If
22 there were 25 miles of continuous boulders that were
23 spaced two feet apart and the flow depth was such that
24 all of those boulders were sticking out by half their
25 diameter, that would certainly be an obstruction to

1 floating that reach of the river, anyways.

2 Q. How about one mile of the same boulders?

3 A. Could be, could be.

4 Q. You talked a little bit this morning about the
5 draft statement of facts that you got from the Attorney
6 General's Office?

7 A. Yes.

8 Q. Did that statement of facts form any part of
9 the basis for your opinion?

10 A. No. Basically it was just a summary of things
11 that were already out there.

12 Q. I'm doing the best I can with the page numbers
13 on your PowerPoint. Just bear with me a minute. Let's
14 go to your Gila River PowerPoint now. I'll get the page
15 numbers off it. Page 142. You talk there about the
16 rating curves, the hydraulic rating curves; is that
17 right?

18 A. Yes.

19 Q. The depths that come out of those curves,
20 where in the river is that depth?

21 A. It's at the fallway, so it would be in the
22 main flow, low flow channel. It would typically be the
23 deepest point.

24 Q. Is that deepest point always in the middle or
25 can it be someplace else?

1 A. It could be, it could be in the middle. Could
2 be someplace else.

3 Q. And so that's not an average depth across the
4 whole fallway. It's one maximum deepest point; is that
5 right?

6 A. Sure, yeah. Yes. Based on my experience in
7 being in rivers and measuring rivers, when you talk
8 about it being a point, it's very unlikely to be a
9 point. Typically the channel has some relatively
10 flatness to it, some width of that, that depth.

11 Q. You've been out on the Gila lots of times,
12 right?

13 A. I have.

14 Q. You want to walk across the Gila, right?

15 A. Some days.

16 Q. If you walk across the Gila, as you walk
17 across, it gets generally progressively deeper?

18 A. Yes.

19 Q. Right? Until you get somewhere around the
20 middle, maybe not exactly the middle; then it gets
21 progressively shallower?

22 A. I would say from the edge, it's clearly a zero
23 depth at the edge of the waterline. It gets deeper at
24 some point, and then typically you walk along, let's say
25 the central portion of the river as opposed to the

1 middle, and you have something that's of more
2 significant depth for a distance, and then sometimes it
3 gradually comes up to the waterline. Other times it's a
4 sharper rise. Sometimes it's sharp on both sides. It
5 varies.

6 Q. And sometimes you're walking across the middle
7 of the river, and all of a sudden it gets shallow.

8 A. I can't think of any particular times like
9 that, but it's not impossible to imagine that scenario.

10 Q. There can be sandbars in the middle of river,
11 right?

12 A. Oh, there sure can, yes.

13 Q. And there are times it gets shallower, and you
14 take the next step, and it gets deeper all of a sudden?

15 A. It does, yes.

16 Q. So in natural conditions, ordinary conditions,
17 those rivers aren't smooth parabolas necessarily, right?
18 The Gila?

19 A. You know, I would say you could approximate
20 the geometry with a smooth parabola.

21 Q. But the walking across the river that you and
22 I just talked about wouldn't happen unless it was a
23 smooth parabola, or quite that way, would it?

24 A. It could. Usually you could -- well, you
25 could approximate a river geometry with some kind of

1 parabolic shape. Is it going to be a mathematically
2 defined parabola at every point on a river? Of course
3 not. But I think that's a reasonable approximation of
4 the geometry of a river.

5 Q. Let's go to your navigability Gila River
6 PowerPoint. Let's stay on that. Let's go to Page 4.
7 The last bullet point there said -- it talks about an
8 update, and it says, "This presentation provides that
9 update." Do you see that?

10 A. Yes, I do.

11 Q. What empirical work have you done since 2005
12 as part of this update?

13 A. By empirical, you mean mathematical?

14 Q. Mathematical, work in the field, anything that
15 comes up that results in data or observations.

16 A. "Data" is kind of a broad term, as is
17 "observations." Well, I'll tell you what we've done.
18 We did a more extensive search of literature,
19 particularly newspaper accounts. When we previously did
20 these updates -- let's hit the pause button there for
21 just a second. It's important to know that the previous
22 updates were basically taking the reports as published
23 and really not adding any new information to those at
24 that time. It was just updating the language to reflect
25 the changes in the legislation.

1 So the first update had to do with the
2 presumptions of nonnavigability, and we added material
3 to the report to adjust those. The second was to take
4 those out. And in this update here, we did a few
5 different kinds of things. We looked at the newspaper
6 accounts. We looked for other historical information as
7 it came available. There were more flow data available.
8 It's been 20 some years.

9 Also you asked about the fieldwork. I went
10 out and boated segments of the Gila that still are live
11 streams and documented those in photos. We did
12 classification of the rapids all along the river. And
13 there may be some other things I'm forgetting. But
14 basically the material you saw yesterday would be our
15 update.

16 Q. In the work you've done since 2005, did you
17 find any new flow data relating to the period before
18 1912 that you didn't already have?

19 A. No.

20 Q. You, I assume, in the work you've done in the
21 20 years or so here on navigability and the work you've
22 done in other states, have reviewed various court
23 decisions relating to navigability of particular
24 watercourses?

25 A. I'm aware of them, yeah.

1 Q. Of the work you've done and the cases you've
2 looked at, what's the lowest median flow that you're
3 aware of of any watercourse that any court or any other
4 tribunal has ever found navigable?

5 A. You know, I haven't, I haven't looked at
6 those, that information, so --

7 Q. So you haven't looked at other cases around
8 the country, other rivers around the country and said
9 here is a watercourse that the court found navigable and
10 look at what the flow rate was?

11 A. The only time we've done anything like that is
12 I know that you folks, I believe, submitted a list of
13 rivers that had mean annual flow rates. I've looked at
14 that data set right there. But no, I haven't done a
15 search for that. I know that each river is supposed to
16 be considered on its own merits.

17 Q. You said you had done some work on
18 navigability in Alaska?

19 A. I have.

20 Q. What rivers have you worked on up there?

21 A. The Chitina and the Mosquito Fork, the Forty
22 Mile.

23 Q. Have those watercourses been litigated in
24 terms of their navigability yet?

25 A. No, they're in process.

1 Q. Will you testify in those cases?

2 A. In the Forty Mile case, it's likely that I
3 will.

4 Q. Have you presented an opinion that either of
5 those watercourses is navigable?

6 A. I have not.

7 Q. Have you presented an opinion that either of
8 those watercourses is not navigable?

9 A. I have not.

10 Q. Flipping over to Page 9 of your navigability
11 Gila River PowerPoint. The second bullet there talks
12 about a compound channel. And you discussed a compound
13 channel yesterday, and I appreciated the clarification
14 on it.

15 The compound channel can have more than one
16 low flow channel, can't it?

17 A. It could, yes.

18 Q. And if there's a given amount of water coming
19 down the river, and some of the water goes in one low
20 flow channel, and some of the water goes in another low
21 flow channel, there's by definition less water in each
22 of those two channels than there would have been if they
23 were all in one channel, right?

24 A. Well, it would be the same amount of water;
25 it's just divided in two.

1 Q. So each channel has less water in it?

2 A. Yes.

3 Q. Have you done any empirical work on the Gila
4 to look at the amount of flows that were present in
5 different low flow channels when there was more than one
6 channel that existed?

7 A. Well, I've canoed most of river from the New
8 Mexico line down to Safford, and then from the dam, the
9 Coolidge Dam down to Ashurst-Hayden, and I would say 99
10 percent of the river is in a single channel.

11 Q. Okay. There are times though when there's a
12 separate channel?

13 A. Oh, sure.

14 Q. Do you think that there were also times under
15 ordinary and natural conditions where there was more
16 than one low flow channel at any part of the Gila?

17 A. Oh, it's likely that there was a split channel
18 here and there. It's a situation that occurs on the
19 Colorado. It's a situation that occurs on the
20 Mississippi. It's not unusual in rivers at all.

21 Q. But you don't have any way to know in those
22 instances what portion of the water went in which
23 different channel?

24 A. I could tell you about the relative percents
25 of distribution of flow on the portions of rivers that

1 I've boated, but I couldn't speak specifically to a
2 split that existed a hundred years ago.

3 Q. Flip over to Page 18 of your --

4 CHAIRMAN NOBLE: Mr. McGinnis.

5 MR. MCGINNIS: Yes, sir.

6 CHAIRMAN NOBLE: Would this be an appropriate
7 time to break for lunch?

8 MR. MCGINNIS: Any time you'd like would be an
9 appropriate time.

10 CHAIRMAN NOBLE: We are now broken for lunch.
11 We'll get back together at about 1:15.

12 (Recessed from 11:57 a.m. to 1:15 p.m.)

13 CHAIRMAN NOBLE: We might as well go ahead and
14 start. Please go ahead.

15 MR. MCGINNIS: I have one housekeeping matter
16 before we start. We have a PowerPoint for Dr. Mussetter
17 who is going to testify tomorrow or day after, whenever
18 we get to him. We filed that with the Commission by
19 e-mail today. And there are hard copies here so people
20 have them.

21 CHAIRMAN NOBLE: Thank you.

22 BY MR. MCGINNIS:

23 Q. Good afternoon, Mr. Fuller. Yesterday, when
24 you were testifying, you talked some about the general
25 Land Office surveyors that had been in the area in the

1 1800s; do you recall that?

2 A. I do.

3 Q. And you said, generally you said those folks
4 weren't focused on navigability. Do you recall that?

5 A. Yes.

6 Q. What's the basis for your opinion or your
7 statement there?

8 A. The purpose of their surveys was to set the
9 boundaries.

10 Q. What documents did you look at to determine
11 what the purpose of the surveys was?

12 A. That's just what GLO Surveyors were doing.

13 Q. Did you review any of the survey manuals that
14 they were working under, personally?

15 A. Just reviewed -- I've read the excerpts that
16 have been presented in various expert reports, whatnot.

17 Q. But you didn't personally go and do any
18 research into the --

19 A. No.

20 Q. -- instructions those folks were working
21 under?

22 A. No.

23 Q. We're still on your Gila River PowerPoint,
24 right?

25 A. We are.

1 Q. Is that what's up there? Yes?

2 A. It is.

3 Q. Let's go to slide 97. This says Gila River
4 near Wilton Crossing. Do you know where Wilton Crossing
5 is?

6 A. You know, I looked it up and I do not.

7 Q. Do you think that might be Welton?

8 A. I thought about that. It came out of
9 Littlefield's report, so --

10 Q. We talked some this morning about the
11 possibility of multiple channels. Do you recall that
12 discussion?

13 A. I do.

14 Q. Is this one situation where it looks like
15 there are multiple channels in the Gila River?

16 A. It's difficult to tell where exactly the
17 channel is in that. Certainly there are multiple flood
18 channels there.

19 Q. And the water in each one of those channels is
20 less than it would have been if there was only one main,
21 one channel, right?

22 A. Yeah, I'll also point out that the date here
23 that's listed is 1910. So you're not looking at the
24 ordinary and natural history of the river.

25 Q. You don't know that that wasn't also the

1 condition at that particular place sometime under
2 ordinary and natural conditions, do you?

3 A. From this photograph, all I know is this is
4 what it looked like in 1910.

5 Q. Let's go to slide 121 on the same PowerPoint
6 presentation. We talked some during our discussion this
7 morning about what you consider a successful boating
8 trip for purposes of determining navigability. And this
9 is the slide that you have in your presentation on that
10 subject, right?

11 A. This is slide 121 of my presentation.

12 Q. And there you have, it says definition of
13 failure. So you're talking about things that you would
14 consider an unsuccessful boating adventure, right?

15 A. Yes.

16 Q. So if somebody dies, it's unsuccessful?

17 A. Yes.

18 Q. If somebody gets seriously injured, you would
19 consider it unsuccessful?

20 A. Particularly for those persons. However, I
21 guess I can conceive of a case where there were lots of
22 people on a boat and one person died; someone might
23 judge the overall success of it. But certainly it's a
24 black mark on the record.

25 Q. Some person gets injured that you wouldn't

1 consider serious, that doesn't necessarily mean it's a
2 failed trip?

3 A. Yeah, particularly, you know, I guess I should
4 clarify here. I'm talking death due to boating. So,
5 you know, if somebody died of a heart attack because
6 they were old, that has nothing to do with boating. So
7 clearly somebody died because of the boating trip.

8 Q. So the next bullet says cargo lost, not
9 recovered. So if the cargo of the boat spills out, gets
10 in the river, and you can sometime recover it back in,
11 you would consider that a successful trip?

12 A. Sure.

13 Q. And the next bullet says boat destroyed, not
14 repairable. So if there's damage to the boat, that
15 doesn't make it unsuccessful?

16 A. Correct.

17 Q. So in your definition of navigability, if we
18 have one event, just one account on the river, somebody
19 is injured but not seriously, cargo all gets spilled
20 into the river but they later pick it up down the river,
21 and the boat is harmed but not destroyed, you would
22 consider that successful?

23 A. Yes.

24 Q. And you would consider that evidence, that one
25 trip under those conditions evidence that the river is

1 navigable?

2 A. That's not the case at all. There's many
3 trips here.

4 Q. No, I'm talking about if there was one trip of
5 the way we just talked about, would that mean that the
6 river was navigable?

7 A. So in that hypothetical situation, I guess
8 I'll wait for a river in which that's the situation and
9 consider all of the evidence that's available and make
10 my decision at that time.

11 Q. Okay. The evidence that's available in my
12 question is that one trip with the same flow pattern
13 that you have on the Gila. Would that river be
14 navigable under your view of the definition?

15 A. So you're saying -- your hypothetical
16 situation, what you're saying is it's a river exactly
17 like the Gila River, and yet the only thing that we know
18 about it is this one trip that occurred, and in this one
19 trip a person was injured in his account, and there was
20 some type of damage to a boat but the boat was still
21 usable, and they reached their destination, although
22 somewhere along the way they dropped some of their
23 material in the water and picked it up again.

24 Q. Yes.

25 A. That's the only information that's available

1 of any kind of which to make a navigability decision.

2 Q. That's my question.

3 A. It's kind of out there in the reality there.

4 Q. I didn't ask you if it's out there. I would
5 ask you to answer the question. I agree that it's out
6 there. Okay. Let's stipulate to that.

7 A. Yeah, I guess if that was the only kind of
8 information that anyone had of any kind, yeah, I guess
9 that's a successful attempt.

10 Q. Let's go back to Page 18 of your Gila River
11 PowerPoint.

12 A. 18?

13 Q. 18, yes. Sorry for skipping around. Page 18
14 you have the second bullet point there that says
15 braided, meandering compound rivers can all be navigated
16 if; do you see that?

17 A. Yes, I do.

18 Q. What goes into that blank after "if"?

19 A. If the river is deep enough.

20 Q. So if there's a whole lot of water, all of
21 those things can be -- all of those characteristics can
22 be there and the river can still be navigable?

23 A. Yes.

24 Q. So would you agree with me that braided,
25 meandering and compound channels, rivers with those

1 channels require more water to float a boat than would a
2 single channel?

3 A. A meandering channel is a single channel.

4 Q. Okay. A braided channel, does that require
5 more water to float a boat in in total than a single
6 channel?

7 MR. KATZ: Only question I have, are we
8 talking about flow channel or the flood channel?

9 MR. MCGINNIS: Well, however he defines
10 braided channel.

11 THE WITNESS: Well, if we're talking about the
12 low flow channel, the boating channel, if it were
13 braided and those braids had a cumulative width that was
14 larger than the single channel, and all other factors
15 were equal, then in all likelihood the braided channel
16 would be less deep. In some circumstances under low
17 flow conditions, that might make it, in that individual
18 braid at that particular location, it might make it not
19 navigable at that point; it might make it not boatable
20 at that point.

21 BY MR. MCGINNIS:

22 Q. What if the cumulative width of the total of
23 the braided channels is the same as the width of the
24 single channel? Wouldn't the water level on each of the
25 braided channels be lower?

1 A. If the cumulative width of the braids were the
2 same as the single channel width? I'm thinking about
3 that one. Kind of thinking the boundary roughness would
4 increase. Might actually be deeper.

5 Q. If you can't answer it, that's fine.

6 A. You're telling me the widths, when you say the
7 cumulative width, you mean, I've got, let's say, two
8 braids. Make it a simple case. One braid is ten feet
9 wide and the other braid is ten feet wide, and you're
10 comparing that to a twenty-foot wide channel.

11 Q. Yeah. What's the difference in the widths of
12 those two situations?

13 A. Widths would be the same.

14 Q. Going to Page 20.

15 A. This is 18, 19, and what?

16 Q. Are we on the right one?

17 A. You know what? I'm sorry. I was scrolling
18 down, going the wrong direction.

19 Q. I spent the last 24 hours trying to figure out
20 the pagination of your two versions of the PowerPoint,
21 so don't mess me up any more than I already am.

22 The bottom bullet point there says, talking
23 about PPL Montana, and you say, not so brief that it is
24 not a commercial reality. Do you see that?

25 A. Yes, I do.

1 Q. And I'm assuming that's a reference to the
2 U.S. Supreme Court decision in PPL Montana?

3 A. Yes, it is.

4 Q. In your view of how you applied the standard
5 here, what would be so brief as to not be a commercial
6 reality? How do you apply that standard?

7 A. Well, I think like so many things in science,
8 there isn't an exact number that says this is the
9 length. But I'm taking that as a relatively common
10 sense so that certainly a navigable portion -- wouldn't
11 consider a river navigable if it had a 200-foot long
12 pool that was six feet deep and everything else on the
13 river was two inches deep.

14 Q. How about in terms of time, duration of which
15 something is navigable?

16 A. Well, I guess it depends on what the
17 conditions, the climate and geographical conditions of
18 the river are. I know in Alaska there are navigable
19 rivers that are frozen for six months of the year.
20 There's not a lot of water, not liquid water anyways.

21 I guess as we've gone through the navigability
22 cases over the last couple decades here, I know we
23 talked a lot about ephemeral streams. I think that's
24 certainly an example where there is a spike due to a
25 hard rain, river comes up, river drops down in the

1 course of 24 hours, 48 hours, something like that.
2 Certainly that's too brief. The way I've interpreted
3 the Daniel Ball Test in terms of ordinary would be
4 regular and expected. Something that somebody could
5 reasonably plan on the water being there. Is that
6 enough of an answer for you? You get where I'm going --

7 Q. Close.

8 A. -- or do you want a number of days?

9 Q. No, that was my next question though. Is
10 there some minimum number of days that you have in your
11 mind as the standard that you applied in this instance?

12 A. No, I never thought about it, and it never
13 came up in this case.

14 Q. How about if something that was capable of
15 being navigated in some years but not others?

16 A. Yeah, I think that speaks to the ordinary and
17 natural conditions I talked about yesterday. So I want
18 to eliminate years that are drought years. So that you
19 might have -- really doesn't matter in this case,
20 because I think there are drought periods that lasted
21 for portions of years, but we had some historical
22 descriptions that I showed you yesterday where somebody
23 observed that the river was dry. I think that was in
24 Segment 6, at some point in that section. But that was
25 for a period of time, and certainly that evidence that's

1 been submitted by experts other than me indicate that
2 the median flow rates are substantially larger. So what
3 I'm getting to is that if ordinarily it were dry for
4 most of the year, that doesn't sound like a navigable
5 river to me at all.

6 Q. When you did your PowerPoint that you gave us
7 yesterday, did you take some slides out from the
8 PowerPoint that you had done a week or two ago that got
9 submitted to the Commission?

10 A. I may have.

11 MR. MCGINNIS: Your Honor, may I approach?

12 BY MR. MCGINNIS:

13 Q. I had a question. There was a -- there was a
14 slide that I saw in your first one that's not in this
15 one. Does that seem familiar?

16 A. Yeah, I took that out because it's in the
17 boating presentation.

18 Q. Okay. That's slide 21 that was in your
19 original PowerPoint from the last week?

20 A. Right.

21 Q. So that is now -- you just changed, moved it
22 to the other PowerPoint?

23 A. It was in both, and I decided we didn't need
24 to go over it twice.

25 Q. Let's go to Page 26 then of the Gila River

1 presentation. And you talked about this slide some
2 yesterday. My question is, for example, in the second
3 bullet point, the second bullet point there, it says
4 gage record underestimates natural flow rates. Do you
5 see that?

6 A. Yes.

7 Q. How do you know that's true?

8 A. That's been the conclusion of every expert in
9 court I've seen. If I compare the rates that are in the
10 USGS record, the long-term records from USGS, the median
11 monthly flow rates are all lower than those estimates
12 that have been done by others.

13 Q. Okay. Other than the fact that other people
14 have come to the same estimate you have, how do you know
15 that's always true?

16 A. No, no, no. I'm saying in respect to the Gila
17 River. I'm not trying to make a general principle for
18 other rivers other than the Gila River.

19 Q. Okay. If there were no human depletions from
20 the system, would your statement still be true?

21 A. If --

22 Q. If there were no diversions?

23 A. No diversions from the river, there was no
24 storage, there were no changes, and you're saying if we
25 were in -- the ordinary and natural conditions had never

1 changed, USGS records should be fairly representative of
2 ordinary and natural conditions.

3 Q. Have you done, yourself, have you done any
4 analysis to determine how much higher the natural flow
5 rates were than the gage records at any point along the
6 Gila?

7 A. In our original reports we reported on
8 pre-development flow estimates that were available at
9 the time, but for this update I did not do any new
10 calculations.

11 Q. Flipping over to Page 28 of your PowerPoint,
12 still on the Gila River PowerPoint. On the third bullet
13 there you say that the Gila River is still used for
14 navigation. Can you tell me which reaches you're
15 talking about, which segments?

16 A. 1, 2, 4, 5.

17 Q. Not talking about 6, 7 or 8 there.

18 A. No.

19 MR. KATZ: What was the question again? I'm
20 sorry.

21 MR. MCGINNIS: What segments --

22 THE WITNESS: What segments were used for
23 navigation today? And I guess there's some minor parts
24 of boating that goes on in Segment 7.

25 BY MR. MCGINNIS:

1 Q. In Segment 7, the kind of boating you're
2 talking about really is on artificial flows created by
3 effluent releases, right?

4 A. That's correct.

5 Q. And return flows for agriculture?

6 A. Yes.

7 Q. Have you done any analysis to determine
8 whether the frequency and regularity of those return
9 flows and effluent flows is different than what the
10 natural flows would have been in the river?

11 A. I haven't done any analysis, not specifically.

12 Q. Would you expect the effluent flows from 91st
13 Avenue Treatment Plant to be more regular than the
14 natural flows in the Salt and Gila Rivers?

15 A. I understand they go up during halftime of the
16 Super Bowl, but they were very different from the
17 natural condition.

18 Q. And actually more uniform, right?

19 A. Yes.

20 Q. Except for the halftime of the Super Bowl.

21 Also there on slide 28, last bullet, you say
22 the Gila River was more susceptible to navigation before
23 it was dammed, diverted, and altered. Do you have any
24 way to gage how much more susceptible it was?

25 A. No.

1 Q. Before there were dams built on the rivers
2 upstream, the river was subject to flood flows, right?

3 A. Yes.

4 Q. More subject to flood flows?

5 A. The river downstream became less
6 susceptible -- it was less susceptible to flooding
7 downstream of the dams.

8 Q. And I think you talked about this morning that
9 the flood flows are one of the things that changes the
10 geomorphology of the channel, and can, at least for some
11 period of time, cause them to be less navigable?

12 A. My testimony was that the flood flows can
13 change the flood channel, but they make no significant
14 difference in the local channel.

15 Q. I thought the very first question I asked you
16 when we sat down, we looked back at your testimony from
17 2005 where you said they changed the low flow channel,
18 too. Did I miss that?

19 A. I said yes, they do change it. But it doesn't
20 necessarily -- I didn't say that it made it less
21 navigable.

22 Q. But it does affect it?

23 A. It changes -- it can change the geometry of
24 it, the location of it.

25 Q. Page 48 of that same PowerPoint.

1 You talk there about -- this is in Segment 6,
2 from Ashurst-Hayden to the Salt River confluence being a
3 losing stream with declining flow. Do you see that?

4 A. Yes, I do.

5 Q. And that's your opinion also with respect to
6 Segment 7 and 8, correct?

7 A. Yes.

8 Q. A losing stream, my understanding of a losing
9 stream is it's a stream where it loses water as it goes
10 down its course, correct?

11 A. Typically the flow rate declines in the
12 downstream direction.

13 Q. So if the flow rate declines in a downstream
14 direction, it would be possible for a river to be more
15 navigable upstream than it is downstream; is that
16 correct?

17 A. Yes.

18 Q. Have you done any analysis to determine the
19 level of -- the magnitude of the losing nature of the
20 Gila River?

21 A. No.

22 Q. Do you know if anybody else in this case has
23 done any of that work?

24 A. I believe Mr. Gookin has some estimates from
25 flow rates coming in and going out of Segment 6,

1 specifically.

2 Q. Have you done any analysis to determine the
3 amount of losses per mile on any segment of the river?

4 A. No.

5 Q. Based upon evapotranspiration and natural --

6 A. No, I have not.

7 Q. Have you done anything to determine what the
8 amount of the evaporation is from phreatophytes in the
9 lower Gila River?

10 A. No.

11 Q. Let's go to slide 57. At least I'm going in
12 order. Slide 57 deals with Segment 7, which is the Salt
13 River confluence to Dome, right?

14 A. That's correct.

15 Q. And were you the one that made the
16 determination of where you break the segments off?

17 A. Yes.

18 Q. Why did you stop this one at Dome?

19 A. As I said yesterday, it had to do primarily
20 with the use, historic use of the river.

21 Q. Is there anything different about the river
22 between upstream of Dome and downstream of Dome?

23 A. Not till you get to the backwater area which
24 is very near the confluence.

25 Q. Have you been on the river in that area around

1 Dome?

2 A. Only at road crossings.

3 Q. Do you know of any geologic features that
4 occur in that area around Dome?

5 A. There are some low mountains that the river
6 passes through in its valley.

7 Q. There's actually a mountain that comes really
8 close to the river right there at Dome, right?

9 A. Where it's at right now, yeah.

10 Q. Do you know about whether there's the presence
11 of bedrock in that area around Dome that would push
12 water to the surface from the subflow of the river?

13 A. That may be possible.

14 Q. You don't know one way or the other?

15 A. I don't know.

16 Q. Do you know what the elevation change is from
17 Dome to Yuma, the surface elevation?

18 A. I have the information, but sitting here today
19 I don't know.

20 Q. Is it more or less than from Dome to Phoenix?

21 A. I don't -- total elevation or the slope?

22 Q. Change in elevation.

23 A. You know what, I don't know either, so either
24 way.

25 Q. Go to Page 57. 57 deals also with Segment 7.

1 You have a bullet point there that says perennial. Do
2 you see that?

3 A. Yes.

4 Q. Is part of your opinion that Segment 7 is
5 navigable based upon your understanding that that part
6 of the river is perennial under ordinary and natural
7 conditions?

8 A. Yes.

9 Q. And if there was evidence in the record that
10 there were at least days when portions of that segment
11 were dry, would that change your opinion?

12 A. If it were days, no.

13 Q. But if it was weeks?

14 A. If it were months, sure.

15 Q. Is a perennial stream ever dry?

16 A. Yes.

17 Q. How long could a perennial stream be dry
18 before it's no longer perennial?

19 A. It also depends on whether we're talking about
20 in its ordinary and natural condition or we're talking
21 about extreme drought. But if it occasionally dries up,
22 my understanding is that rivers can be classed as
23 perennial even if they occasional dry out for short
24 periods of time.

25 Q. So just because you put perennial on the slide

1 doesn't mean that this portion of the river didn't
2 occasionally dry up even under ordinary and natural
3 conditions?

4 A. I'm unaware of it drying up in ordinary and
5 natural conditions.

6 Q. Let's go to Page -- slide 65. I'm sorry, I'm
7 trying to read the page number. 65 deals with some of
8 the archaeology; is that right?

9 A. Yes.

10 Q. The middle bullet points there says,
11 river-dependent people in all segments. Do you see
12 that?

13 A. Yes.

14 Q. Were you at the hearing on the Gila River
15 during the portion of the hearing back in 2005 when
16 Mr. Gookin testified about the uses of the river by the
17 Pima Indians?

18 A. Yes.

19 Q. Do you remember him testifying that the Pima
20 Indians, when they wanted to travel along the river,
21 they didn't use boats, they ran?

22 A. I don't recall it specifically, no.

23 Q. Let's go over to slide 72. Slide 72, the
24 bottom bullet point there you say that the Native
25 American tribes along the Gila River were not

1 boat-dominated societies? What did you mean by that?

2 A. I'm just trying to express that the
3 archaeological record of any kind of boat use in the
4 interior areas is relatively scant. So they don't call
5 themselves "We are the boating people."

6 Q. You understand that one of the Pima tribes, at
7 least, called itself the river people?

8 A. Yes. That's what I meant by the previous
9 slide.

10 Q. And in your experience in dealing with other
11 navigability cases and just dealing in your work in
12 general, do you find that tribes that live along
13 navigable rivers often were not boat-dominated
14 societies?

15 A. Often? Navigable rivers? There are -- I'm
16 not quite sure how to answer that, where you're going
17 with that, Mark. But I can tell you that yes, there are
18 Indian tribes that live along rivers that do use boats.

19 Q. In your work in Alaska and other places, for
20 example, do you have any place where there's an Indian
21 tribe that lives along a river that's navigable that
22 there's not any history of boat use?

23 A. No. There's a lot of rivers in Alaska, and
24 I've only worked on a handful.

25 Q. The ones you worked on, were there Native

1 American tribes living on them?

2 A. Yes.

3 Q. Did they use boats?

4 A. I'm not aware of the Chitina using boats,
5 although it wouldn't surprise me.

6 Q. Moving over to Page -- slide 75. Here you're
7 talking about why the trappers and explorers didn't use
8 boats, right?

9 A. Yes.

10 Q. About halfway down the page there's a bullet
11 that says, Character of the country overland travel
12 easier; do you see that?

13 A. I do.

14 Q. Have you read all the historical accounts of
15 the people going across the Gila Trail and other of
16 these -- other overland traveler accounts that are in
17 the record?

18 A. I doubt that I've read all of the accounts of
19 those things.

20 Q. You've read some of them?

21 A. I've read some of them.

22 Q. Sound like a pretty miserable trip for those
23 folks in some of those instances?

24 A. They certainly encountered some difficulties.

25 Q. And you still, even after seeing all those

1 difficulties, believe that overland travel was easier
2 for a lot of people than going down a navigable river?

3 A. Yes.

4 Q. I'm sorry, what was your answer?

5 A. Yes.

6 Q. And why is that?

7 A. They had a wagon. They had oxen. They had
8 gear. They didn't have boats, necessarily. Would have
9 needed to build a boat. They were used to traveling in
10 their wagons, horses, whatever. That's what they were
11 familiar with. They didn't have a map necessarily that
12 said this is what this river is going to be like if you
13 go down there. They would have needed to disassemble
14 whatever they were traveling on, load it on a boat,
15 reassemble it when they got to wherever they were going.
16 Plenty of reasons.

17 Q. At the bottom of that same slide you have a
18 statement that says, why did they canoe the Colorado?
19 There were no land alternatives. And I know you talked
20 a little bit about that with Mr. Hood this morning. Can
21 you tell me what you meant by no land alternatives?

22 A. The same thing I told Mr. Hood this morning.
23 If you go to California and you need to cross the river.

24 Q. You didn't mean that there were no land
25 alternatives to go up and down the Colorado, right?

1 A. No.

2 Q. The terrain up and down the Colorado is not
3 radically, at least until you get to the Grand Canyon,
4 it's not radically different than the terrain up and
5 down the Gila, is it?

6 A. There certainly are similarities.

7 Q. And you know there was an overland mail route
8 that went from Yuma up through Ehrenberg in that area in
9 the 1800s. Did you see that evidence in the record?

10 A. Yes.

11 Q. So there was a land alternative up and down
12 the Colorado, right?

13 A. Yeah, I'm not sure that it was there in 1820
14 but --

15 Q. But in the 1800s sometime there was --

16 A. In the 1800s, sure.

17 Q. Go to Page 99. And there was some discussion
18 yesterday and this morning about the steamboats going up
19 to Gila City. It's your understanding Gila City is
20 about the general area where Dome is?

21 A. I'm not exactly sure where Gila City was.

22 Q. Okay. So you don't know how many miles up the
23 river it was?

24 A. As I sit here today, no.

25 Q. Do you know any record of any steamboats ever

1 going up the Gila past Gila City or Dome?

2 A. No.

3 Q. And the accounts in the 1860s, that was before
4 substantial upstream diversions anywhere on the Gila
5 watershed, right?

6 A. As far as I know, yes.

7 Q. So as far as you know, when the river was in
8 its ordinary and natural condition, steamboats went up
9 the Gila River to around Dome or Gila City and then
10 stopped there?

11 A. That's my understanding.

12 Q. Is your recollection from reading the
13 materials that there was quite a bit of competition for
14 business among the steamboat companies around Yuma?

15 A. I don't recall that specifically.

16 Q. If I may approach.

17 I'm giving you a document that was submitted
18 by the State Land Department. It's Exhibit 33 or tab
19 No. 33 in the Land Department's submission. Direct your
20 attention to what I believe is the -- they're not
21 numbered unfortunately -- the sixth page.

22 Sixth page, the top of the page says, Colorado
23 River is an opposite for Yuma. Do you see that?

24 A. Yeah, I'm on that page.

25 Q. Okay. Second full paragraph there says the

1 increase in competitive paddle wheelers. Do you see
2 that?

3 A. Yes.

4 Q. Could you read that paragraph -- and you can
5 read it to yourself or out loud, whichever you prefer.

6 A. I've read it.

7 Q. Okay. So this paragraph of this document that
8 the State Land Department submitted talks about there
9 being a lot of competition among the steamboat operators
10 in Yuma, right?

11 A. Yes.

12 Q. And it even talks about because of the
13 competition, some of the steamboat companies or at least
14 one steamboat company was looking into expanding its
15 roots all the way up to a place called Callville. Do
16 you see that?

17 A. I do.

18 Q. Do you know where Callville was?

19 A. I have a vague understanding of where it is.
20 I've seen it discussed, yeah.

21 Q. Pretty far up the Colorado, right?

22 A. A bit.

23 Q. And they were going to make a deal with some
24 folks in Salt Lake City to take things up to Callville
25 in an overland to Salt Lake City. Is that what this

1 says?

2 A. Yes.

3 Q. And that's in 1864, right?

4 A. Yes.

5 Q. The same time that we think, according to your
6 testimony earlier, that steamboats were going up, a few
7 miles up the Gila to Gila City or Dome and then stopping
8 there, right?

9 A. That is that same time frame, yes.

10 Q. Have you seen any information at all that
11 steamboat operators in Yuma, while this competition that
12 they were in for business was going on, tried to expand
13 their steamboat operations any further up the Gila other
14 than to Dome or Gila City?

15 A. In this paragraph, no.

16 Q. Have you seen anything anywhere in the record
17 that talks about that?

18 A. No.

19 Q. Let's go to Page 101 of your PowerPoint. And
20 you talked about this at some length with Mr. Hood, and
21 I'm not going to plow old ground. This is the --
22 Mr. Pattie's use of the river. And my question is, he
23 asked you questions about going back and forth
24 between -- going from Safford to Yuma several times,
25 right?

1 A. Yes.

2 Q. My question is, do you know how he got from
3 Yuma back to Safford?

4 A. I do not.

5 Q. Do you know how long each trip took?

6 A. I do not.

7 Q. You talked some earlier with Mr. Hood about
8 the Davis book, Goode B. Davis. Is that the book you
9 were talking about?

10 A. He showed me an excerpt from that book, yes.

11 Q. This is State Land Department's Exhibit No. 3,
12 which I think is the same document you were talking with
13 Mr. Hood about earlier.

14 Direct your attention to Page 9 of that
15 document. Is this a document you would consider
16 authoritative?

17 A. It's certainly a document that I would
18 consider.

19 Q. Okay. It's one that you relied upon in coming
20 to your opinion in preparing your report or not?

21 A. Actually, technically I relied on what other
22 people had relied on in this, in this report or some
23 other document by Mr. Davis.

24 Q. On Page 9 in the first full paragraph about
25 two-thirds of the way down there, there's a

1 characterization of Pattie's memoirs by Goode Davis I'm
2 going to read to you. It says, "Pattie was not
3 attempting to produce a scientific treatise, but rather
4 an exciting adventure story." Do you see that?

5 A. I do.

6 Q. Based on your understanding of Pattie's
7 memoirs, would you agree or disagree with that
8 statement?

9 A. That's a statement I've heard before.

10 Q. So does that statement give you any concern
11 about the historical or scientific validity of the exact
12 details of Pattie's memoirs?

13 A. Not with respect to information that I'm
14 using. I'm not sure how exciting saying we paddled the
15 river several times is. I'm not sure what really that
16 adds. So no, I don't have any particular concerns about
17 that.

18 Q. Let's go to Page 102 of your PowerPoint. This
19 one talks about the Mormon Battalion account; is that
20 right?

21 A. Yes, it does.

22 Q. And you talked some this morning about
23 Mr. Gilpin who testified as part of your team back in
24 2005 as a historian and an archeologist. Do you recall
25 that?

1 A. I do.

2 Q. Here on this slide you say that the Mormon
3 Battalion effort was a complete failure. Do you agree
4 with that?

5 A. No.

6 Q. What do you disagree with about it?

7 A. My point yesterday when I talked about this
8 slide was that Colonel Cooke, that was his words. He
9 characterized the episode as a complete failure. But
10 when you look at the actual facts of the story, the
11 boat, the boatmen, once they had modified their boats
12 and their load, arrived in Yuma. So I would call that a
13 success. As I said yesterday, I'm not quite sure what
14 Colonel Cooke had in his mind when he called it a
15 failure. Certainly they had some difficulties along the
16 way. But like I say, once they got their boat and
17 boating gear figured out they seemed to do pretty well.

18 Q. Would you say that Colonel Cooke would be in a
19 better position than you to determine whether it's a
20 success or a failure?

21 A. I'm not disputing whether he considered it a
22 failure, and I don't know what criteria by which he was
23 measuring it. By the criteria I would use, it was a
24 success.

25 Q. Do you still have the transcript there from

1 November 16, 2005?

2 A. I do.

3 Q. We just established that Mr. Gilpin or
4 Dr. Gilpin was an historian on your team at that time,
5 right?

6 A. That's correct.

7 Q. Let's look at Page 38 of that transcript.
8 I'll read this one for you because it takes -- splits
9 some of the pain of having to do the reading. You just
10 make sure I'm reading it right. Page 38, starting in
11 the middle of Line 21. And this is, again, Mr. Gilpin's
12 testimony, right? Can you tell if this is Mr. Gilpin
13 testifying at this point?

14 A. That's my understanding.

15 Q. He was talking about the Mormon Battalion trip
16 and he says, starting in the middle of Line 21, "So that
17 was really an unsuccessful experience, and the
18 commander, Captain Philip St. George Cooke, in his
19 journal bitterly denounced his subordinate, Lieutenant
20 George Stoneman, for basically not warning him that this
21 wouldn't work, and then once he tried it, not being
22 successful." Did I read that right?

23 A. You read what's on the page, correct.

24 Q. And this is Mr. Gilpin's words, the person
25 that you worked with on this project?

1 A. Yes, it is.

2 Q. Is he a Mister or Doctor? I'm sorry.

3 A. Mister.

4 Q. And if you flip over to Page 81 of that same
5 transcript, Page 81 starting on Line 17, again, this is
6 Mr. Gilpin responding to some questions from Mr. Helm.
7 Starting on Line 17, "And Captain Cooke flat-out stated
8 that he considered it an unsuccessful..." Do you see
9 that?

10 A. I do.

11 Q. But as you sit here today, you disagree with
12 Mr. Gilpin's characterization of the trip?

13 A. Mr. Gilpin is saying what -- he's quoting
14 Colonel Cooke. I don't see anything where he says --
15 you asked him, "Do you consider it a failure and by what
16 criterion?"

17 Q. You recall Mr. Jackson testifying --
18 Dr. Jackson testifying in 2005?

19 A. I remember that he did testify.

20 Q. Do you recall him also testifying that Cooke
21 considered this event unsuccessful?

22 A. Mr. McGinnis, I'm telling you right in front
23 here of the slide, I put right there that yes, Colonel
24 Cooke considered it a failure. We're not arguing that
25 point at all.

1 Q. But you sitting here a hundred and some years
2 later think it was successful?

3 A. The boats arrived. They arrived ahead of the
4 land troops.

5 Q. Nobody died?

6 A. Nobody died. Nobody was injured. That seems
7 like successful boating. Whatever Colonel Cooke had in
8 his head that made that a failure, maybe it was
9 insubordination, maybe it is the fact that they had to
10 lighten their load, maybe that -- who knows what it was.
11 But I don't know what it was.

12 Q. Flip over to Page 103 now -- your slide 103.
13 Again, you talked with Mr. Hood a little bit about this
14 Howard family trip, I think this morning.

15 A. I don't recall talking about this one.

16 Q. Okay.

17 A. Maybe yesterday.

18 Q. I'm sorry?

19 A. We talked about it yesterday.

20 Q. Okay. This is the Hood family trip?

21 A. Howard.

22 Q. I'm sorry, Howard. Yeah, the Hood family.

23 The Howard family trip, and you talked
24 yesterday, maybe it was yesterday you talked about the
25 commander -- comandante at Fort Yuma actually sending

1 out the cavalry for these folks?

2 A. I don't know if it was the cavalry.
3 Supposedly they sent some troops up, yes.

4 Q. Okay. And you don't know why they did that?

5 A. Do not. In the newspaper articles it
6 expressed some sort of concern about danger of some
7 kind.

8 Q. Okay. And this is one of the same newspaper
9 articles that talks about the folks on the boat as
10 reckless voyagers?

11 A. I don't recall that in particular, but it
12 could be.

13 Q. This is State Land Department's document 14.
14 Is this the account, as far as you know, that you relied
15 upon for that particular trip?

16 A. Looks to be, yes.

17 Q. If you look on the second page of this
18 exhibit, not counting the numbered page. Should be one
19 that -- okay.

20 They're all just one really long paragraph.
21 Do you see that? Second paragraph, really long, starts,
22 "The boat referred to."

23 A. Yes.

24 Q. And then I'm going to read for you about
25 two-thirds of the way down in that paragraph starting at

1 "Being informed." Do you see that?

2 A. Yes.

3 Q. Okay. This says, "Being informed by some
4 advance riders of the immigrant party that one of their
5 number with his family was coming down the river by
6 boat, he at once sent a detachment from the Post up the
7 river to give such aid to the expedition as the
8 Lieutenant afterward told the writer....," and then
9 there's a word there, but I can't read it. Maybe you
10 can. See what that next word is?

11 A. I can't.

12 Q. "Not only the possible but probable outcome
13 might require. But the squad passed without seeing the
14 reckless voyagers and did not put an appearance at the
15 fort until several days after the latter had arrived
16 here and in safety." Do you see that?

17 A. Yes.

18 Q. So he sent -- the commander sent the troops
19 out to rescue or what he thought would require a rescue
20 of the folks he referred to or the article refers to as
21 reckless voyagers?

22 A. He did send troops out, and it was to assist
23 those boat travelers who ended up not seeing the troops
24 and arriving safely.

25 Q. If boating the lower Gila in the 1840s was

1 something that people thought was normal or usual or
2 considered safe, would there have been any reason to
3 send the cavalry out for them?

4 A. Indians.

5 Q. Is there any mention of Indians in that
6 article that you know of?

7 A. No.

8 Q. There's a mention of boating in that article
9 though, right?

10 A. It does say the word "boating." It doesn't
11 say that he sent it out because they were boating.

12 Q. Okay. Do you have any other information about
13 that Howard trip?

14 A. There are several things in the record that
15 discuss that. I remember, seems like Mona McCroskey may
16 have written about it, and there was another gentleman
17 who has an article that was written, includes this
18 account.

19 Q. Here is a book by Pancoast. Does that sound
20 familiar?

21 A. There is a book by Pancoast where they talk
22 about -- it's not the one that I was thinking about, but
23 yes.

24 Q. That's the State's document number 17?

25 A. Okay.

1 Q. Sorry. That's the wrong document. Hold on to
2 that.

3 A. Hold it back?

4 Q. Just keep it. We'll get to it.

5 47 is the one I was thinking about. Sorry.
6 This is the Pancoast book. Do you know who Pancoast
7 was?

8 A. Other than the author of this, no.

9 Q. It's your understanding that Pancoast was a
10 person that also accompanied the Howards on that trip,
11 at least the overland part of that trip?

12 A. Are you waiting for an answer?

13 Q. Yeah.

14 A. I don't know. I have a vague recollection of
15 that, but it's not one of the details that I was
16 particularly paying attention to.

17 Q. Have you actually read this chapter from
18 the Pancoast book?

19 A. I have, but I was only really thinking about
20 Mr. Pancoast himself, but if you say so, Mark, fine.

21 Q. Okay. On Page 250, do you see Page 250?

22 A. I do.

23 Q. The first full paragraph there, they start
24 talking about what I believe, at least, is the Howard
25 excursion on the boat. Is that what this is?

1 A. He talks about rafts. My understanding of the
2 Howard was they had a wagon that was built as a, partly
3 as a boat and it was decked and it was one. I'm not
4 sure I recall that there were multiples.

5 Q. It talks about a woman having labor pains?

6 A. Yeah.

7 Q. Do you think that's the same trip as the
8 Howard trip?

9 A. It sure sounds like it because they named the
10 baby Gila.

11 Q. And right above that part of the passage
12 there's a statement that says, "The crew told us
13 afterwards that they found the river shallow and full of
14 bars and the current very rapid."

15 A. Uh-huh.

16 Q. "They frequently found themselves aground and
17 had much difficulty in getting off."

18 A. Uh-huh.

19 Q. Is that consistent with your understanding of
20 what the Gila River would have been in its ordinary and
21 natural condition?

22 A. It does not surprise me that there are
23 sandbars on that portion on the Gila River. Shallow is
24 a relative word. Depends, I guess, relative to the kind
25 of boat you're trying to put down in. We don't really

1 know much about the draw or the loading of this
2 particular boat. So the fact that there are bars there,
3 yes. The current being very rapid, that seems kind of
4 high; but I would expect there to be some current,
5 certainly.

6 And somebody taking a wagon down or a raft
7 down the river would not be unusual for them to
8 occasionally run aground. I don't know what they mean
9 by frequently.

10 Q. Frequently is kind of the opposite of
11 occasionally, isn't it?

12 A. Hmm.

13 Q. It's not a synonym for one another, are they?

14 A. Depends how you use it. Frequently it could
15 be everyday we ran aground once in some person's mind.
16 Another person it might be frequently every ten minutes
17 we were running aground. We don't really know. All we
18 do know is they got down to Yuma.

19 Q. Let's go over to Page 120 -- slide 120. Here
20 you talk about ferries on the Gila, right?

21 A. Yes.

22 Q. Do you recall there being some testimony by
23 Mr. Gilpin back in 2005 about a ferry at Maricopa Wells
24 that had broken loose, gone down the river and got
25 stuck?

1 A. Yes.

2 Q. And that's not something you mentioned in your
3 PowerPoint here, is it?

4 A. There are a lot of things that are in the
5 record that I haven't mentioned in my PowerPoint.

6 Q. Are there any other accounts of boats getting
7 stuck, going down the river and not being able to move
8 down the river that you've neglected to put in your
9 PowerPoint?

10 A. Yeah. So specifically relating to the ferry,
11 so a ferry was designed for cross-river use, as you
12 yourself have pointed out a number of times. It was not
13 really designed for downriver use, and my understanding
14 in this case was a pilotless boat floating downstream,
15 and was not really rigged for downriver navigation, and
16 the fact that it got stuck eventually is not
17 particularly unusual at all. My recollection, too, is I
18 believe this is the account where they went down the
19 stream and they towed it back up to their place and
20 continued to use it.

21 Q. Again, my question was, are there any other
22 accounts that you're aware of of unsuccessful boating
23 trips on the Gila that you didn't include in your
24 PowerPoint?

25 A. No, not aware of any. I really wouldn't

1 consider a broken-loose ferry a boating trip. That's
2 why I didn't include it.

3 Q. Slide 113. This is one about wood floating
4 down to Yuma, right?

5 A. Yes.

6 Q. Okay. Do you know where they were floating
7 wood to?

8 A. My understanding is they were floating it to
9 the prison.

10 Q. At Yuma?

11 A. Yes.

12 Q. Do you know where they were floating wood
13 from?

14 A. I do not. Upstream, other than upstream.

15 Q. Could have been half a mile, could have been
16 ten miles; you don't know?

17 A. It could have been.

18 Q. And you don't know whether the wood -- the
19 source of the wood was above or below Dome?

20 A. I do not.

21 Q. You obviously must have thought it was below
22 Dome because you included this account in Segment 8
23 only, right?

24 A. To be honest, I didn't really think about
25 that. I didn't think about that because I guess my

1 thinking pattern was that other accounts of going up the
2 river to get wood were in that same reach. So I just
3 associated with that reach, and the only point that I
4 knew for sure was down near the prison in Segment 8,
5 so --

6 Q. And you have the date 1897 on this slide.
7 That's the date of the newspaper article, right?

8 A. That's correct.

9 Q. And in the newspaper article they're talking
10 about something that used to happen?

11 A. That's correct.

12 Q. So whatever happened, could have happened
13 before 1897?

14 A. It probably did. And the point of the article
15 was that they were replacing what was just floating of
16 logs down the river with this boom that was collecting
17 the wood out of the river.

18 Q. Let's go over to slide 136. This slide shows
19 average monthly flow data at different locations on the
20 Gila, correct?

21 A. It does.

22 Q. Do you know if there are any natural inflows
23 of water between Gillespie and Dome?

24 A. From time to time there are natural inflows.
25 I'm not aware of any -- between Gillespie and Dome. No,

1 I'm not aware of any.

2 Q. And I thought you testified earlier that
3 Segment 6, 7, and 8 were losing reaches; is that right?

4 A. Yes.

5 Q. If that's true, how can your average flow at
6 Dome, which is downstream, be higher than your average
7 monthly flow at Gillespie?

8 A. You notice the period of record is different.

9 Q. Okay.

10 A. So the data sets that were used to create that
11 average likely include different events.

12 Q. It's different, but it overlaps by a
13 substantial majority of the time, right?

14 A. Yes. But the substantial majority of the time
15 was for post-depletion.

16 Q. So you don't believe that the average monthly
17 flow under ordinary and natural conditions at Dome was
18 higher than the average monthly flow at ordinary and
19 natural conditions at Gillespie?

20 A. Yeah. In fact, these are not ordinary and
21 natural discharges. These are post-disturbance
22 discharge rates.

23 Q. So is it your understanding that in the
24 ordinary and natural condition, the flows at Gillespie
25 were higher than the flows at Dome, or lower?

1 A. I would expect them to be higher at Gillespie
2 than at Dome.

3 Q. Okay, over to slide 187. One of the things
4 you say there about Segment 8, which is the area between
5 Dome and Yuma, right?

6 A. Yes.

7 Q. Is that one of the reasons it isn't boated is
8 because of the distance from major urban centers?

9 A. Yes.

10 Q. Was that also true at the time of statehood?

11 A. Yeah, I don't think there were any major urban
12 centers at the time of statehood.

13 Q. Relative to the number of people who were in
14 Arizona in general, Yuma was a relatively thriving
15 metropolis, for lack of a better term, in the 1800s,
16 right?

17 A. Yeah, by that standard. We don't have a list
18 of population by city at a certain time. I could
19 actually look it up, but my guess is relative to other
20 cities compared to now, its proportion of Arizona
21 population was greater in the 1800s than it is today.

22 Q. And, for example, in 1849 it was a
23 transportation center that a lot of the Forty-Niners
24 went through on their way to California?

25 A. Some of them did, yes.

1 Q. And it was a port on the Colorado River,
2 right?

3 A. Yes.

4 Q. And it was also at a time when there were
5 steamboats going up the river, at least to Gila City and
6 stopping, right?

7 A. In the 1800s, yes.

8 MR. MCGINNIS: I don't know how we're doing
9 for a break. I have some questions about his other
10 PowerPoint. We could kind of stop, or we could just
11 keep going.

12 CHAIRMAN NOBLE: It might be a little bit
13 early. I was planning on stopping around 2:30.

14 MR. MCGINNIS: I'm fine. We might be able --
15 we might be done by then.

16 BY MR. MCGINNIS:

17 Q. All right. Let's go to your other PowerPoint,
18 Jon. This is the boating PowerPoint, right?

19 A. Yes, it is.

20 Q. Slide 4 of that PowerPoint, I think you talked
21 about this a little bit with Mr. Hood this morning, and
22 I don't want to belabor the point. But your last bullet
23 point there says basically navigation was not wagon,
24 hoof, or feet on stream beds, right?

25 A. That is correct.

1 Q. And you'd agree with me that somebody who is
2 walking along the river, that doesn't mean navigable?

3 A. Not according to the Daniel Ball Test.

4 Q. You would agree with me somebody walking along
5 the river pulling a boat doesn't mean it's navigable?

6 A. They are not navigating on water in that
7 particular instance. Whether the river is navigable or
8 not, that would not be evidence.

9 Q. As a matter of fact, the U.S. Supreme Court in
10 the Montana decision that you said you read basically
11 says if you're dragging your boat in the water and
12 walking, that's not navigation. Do you remember that?

13 A. I don't recall that specifically.

14 Q. But you don't, you don't know that that's not
15 correct?

16 A. As we talk about it, I have a vague
17 recollection of it, but I'm just not prepared to testify
18 that's what it said.

19 Q. Do you know -- back to what we were talking
20 about Yuma and the Colorado River -- do you know what
21 the median flow of the Colorado River was in its
22 ordinary and natural condition?

23 A. I do not.

24 Q. Do you have a guess?

25 A. No.

1 Q. Do you think it was -- can you give me a
2 ballpark at all?

3 A. No.

4 Q. Was it more or less than the Gila?

5 A. It would probably be more.

6 Q. Quite a bit more?

7 A. What do you mean by quite a bit? I don't
8 know.

9 Q. Do you think it's double the flow of the Gila?

10 A. I don't know.

11 Q. You didn't look at that?

12 A. I didn't.

13 Q. Over to Page -- slide 8 of your boating
14 PowerPoint. Again, Mr. Hood dealt with this some this
15 morning, and I'll try not to go too long on it. But you
16 talked with him some about the -- this quote here about
17 the 27 years to get the boats right and get the
18 technique right. Do you see that?

19 A. I do see that.

20 Q. In the standard as you applied it of
21 navigability, if that 27-year period, or whatever that
22 number of year period is, ended after statehood, would
23 the river still be navigable?

24 A. Yes.

25 Q. So if there wasn't a boat that could navigate

1 the river at statehood but 27 years later somebody
2 developed a boat that could, you would say under the
3 Daniel Ball Test it was navigable?

4 A. Well, that's a complicated question. First of
5 all, I don't believe that there's a case where somebody
6 invented a kind of boat that would navigate the Missouri
7 River after statehood that didn't exist prior, or I
8 don't think there were any substantially different kinds
9 of boats that were invented after Arizona statehood that
10 created the opportunity to navigate on the Gila River
11 compared to what was available before statehood. But
12 again, going back to your hypothetical, which you seem
13 to like, if the -- it needs to be a boat that was
14 conducted in the customary modes of trade and travel. I
15 interpret that to mean boats, types of boats that were
16 available.

17 Q. Okay. And I'm not trying to dream this
18 hypothetical up out of nowhere. This is just a quote
19 you have on your slide. It said it would take another
20 27 years to "evolve the boats, the experience and the
21 maneuvers required to navigate the Missouri." And you
22 testified about that at this PowerPoint on the Gila
23 River, right?

24 A. I did.

25 Q. And you actually have a bullet point right

1 next to it that essentially repeats the quote on
2 slide 8, right? Can we go back to slide 8?

3 And again, my question was, if statehood
4 occurred during that 27-year period, would you consider
5 the river navigable or not?

6 A. Are we talking about the Missouri River or are
7 we talking about this hypothetical river?

8 Q. Well, suppose it's the Gila River and there
9 was a period of time after statehood while people were
10 still trying to evolve boats, as it says here, to be
11 able to navigate the river. So it's the Gila River, but
12 it's a hypothetical fact I just gave you.

13 A. First of all, the point of this slide is not
14 to discuss the specifics of that particular boat and
15 when it developed. The point of the slide is that
16 sometimes it takes time from the initial attempt to boat
17 something to develop the technology and skills to boat
18 it. So that's the point I was trying to make to the
19 Commission here.

20 A lot of these accounts of first descents of
21 rivers and the time it took before the river changed
22 from its ordinary and natural condition didn't exist in
23 Arizona, particularly given the low population and few
24 opportunities.

25 So to answer your question directly, if there

1 were a river in which it couldn't be boated by any type
2 of boat that was available prior to statehood, and that
3 sometime after statehood there was a boat that was
4 invented or evolved that allowed that boating, I don't
5 think that would meet the Daniel Ball Test.

6 Q. So if, for example, if fiberglass boats were
7 the only kind of boats that could navigate the Gila
8 River, and fiberglass was devised, or invented or
9 however they got to fiberglass, after 1912, then the
10 river wouldn't be navigable?

11 A. If fiberglass boats, but not just a matter of
12 the fact that it was made of fiberglass. If the very
13 existence of fiberglass caused it to be more buoyant or
14 something. I can't imagine what that would be in that
15 event. What I really don't want to see is a posthearing
16 memorandum that says Fuller said fiberglass boats, the
17 invention of fiberglass is responsible for navigability
18 of the Gila River. That's not what I'm saying at all.

19 I'm saying in this hypothetical construct that
20 you've crafted here, which I don't believe applies to
21 the Gila River or its history, but sure.

22 Q. And if inflatable rubber rafts, the type that
23 became available after World War II, were the only kind
24 of rafts that could navigate the Gila River, then the
25 Gila River wouldn't be navigable under your definition

1 of navigability, would it?

2 A. Again, inflatable rafts were available well
3 before statehood. The type of rubber used changed after
4 statehood. But the concept of an inflatable raft --
5 just talking about the change in the durability, the
6 need to fix it, how many times you could bump into
7 something before you wore through it, that was the
8 difference. Really, the difference wasn't in the draft
9 or its maneuverability or anything like that.

10 Q. Now, I tried to be specific in my question,
11 and maybe I wasn't specific enough. I think my question
12 was, if inflatable rubber rafts of the type that became
13 available after World War II were the only type of craft
14 that could navigate the Gila River, would the Gila River
15 be navigable under your application of the federal test?

16 A. I think you asked me the same question, but
17 you substituted "inflatable" for "fiberglass."

18 Q. I meant to ask you exactly the same question
19 because you didn't answer it. So can you answer the
20 question?

21 A. I did answer it. I'm telling you that in your
22 construct, if there were some imaginary type of boat
23 that could be invented, be it fiberglass or inflatable,
24 that appeared suddenly sometime later after statehood
25 that allowed navigation in its ordinary and natural

1 condition, which is just prior to statehood, sure, that
2 would not meet the Daniel Ball Test. It was not a
3 customary mode of travel.

4 Q. Let's go over to slide 15 there. Slide 15
5 there at the bottom you say, if rivers weren't boatable,
6 why did people have boats? Right? That's a question
7 you testified about yesterday --

8 A. It is.

9 Q. -- and a little bit this morning. Okay. If
10 you're a farmer, homesteader in the 1800s along the Gila
11 River, and you farm on an island or on an area that's
12 subject to inundation by the river, and you need a boat
13 to get in and out of your property a few weeks a year,
14 don't you think you would get one?

15 A. Here we are in a hypothetical situation again.
16 I might. I might not.

17 Q. So if you were a farmer that needed a boat one
18 or two weeks a year to get to your property, and you had
19 a boat, there'd be a reason for it, right?

20 A. If you needed a boat and you could afford a
21 boat and you knew how to use a boat, you would probably
22 have a boat.

23 Q. And even though you only needed that boat a
24 week or two or a day or two in a year to get to your
25 farm, if you can't get out and you can't get in without

1 the boat, it's a pretty good reason to have a boat,
2 wouldn't it be?

3 A. It would be a reason to have a boat. Might
4 not be the only reason to have a boat. I'm not sure
5 that's the case.

6 Q. Well, you know there are situations, there's
7 several accounts in the record of people using boats to
8 get to their property or out of their property during
9 floods on the Gila, right?

10 A. During floods.

11 Q. Right. And that was my question, I thought.
12 Did you not understand my question to include that
13 concept?

14 A. You said a couple weeks a year.

15 Q. Okay. Have you reviewed all of the exhibits
16 that the State put in?

17 A. I tried to.

18 Q. Did you assist in picking which exhibits got
19 submitted?

20 A. They asked me for a list of things that I
21 would like submitted.

22 Q. Did you review the exhibits relating to the
23 advertisements from 1908 from a store in Phoenix called
24 Penney and Robinson? Do you recall that?

25 A. How many pages of materials are there? I

1 don't recall that one specifically.

2 Q. Being an outdoorsman, I thought you might have
3 remembered the sporting goods catalog.

4 A. Alas.

5 Q. Pardon me?

6 A. Alas, I do not.

7 Q. This is 56. State's Exhibit 56. Document 56.

8 A. Oh, I do remember this.

9 Q. And this is an advertisement from Penney and
10 Robinson. It looks like a sporting goods store on
11 Center Street in Phoenix that the State submitted as an
12 exhibit, right?

13 A. Yes.

14 Q. And this document talks about it basically
15 being time to go fishing, right?

16 A. Yes.

17 Q. Okay. And it lists some of the things that
18 the store sells here in Phoenix for fishing, including
19 poles, rods, lines, reels and hooks. Do you see that?

20 A. Yes.

21 Q. No mention in any of these advertisements
22 about boats, right?

23 A. That's correct.

24 Q. Do you ever recall seeing in any documents,
25 any of the historical documents any advertisements from

1 anybody in Arizona, any store in Arizona selling boats?

2 A. As I sit here today, no, I don't. Not to say
3 that they aren't there, but I don't recall any.

4 Q. Go over to slide 18. This is a photograph of
5 a steamboat, some kind of boat on the Gila -- on the
6 Colorado, right?

7 A. Yes.

8 Q. Do you have any photographs in all the
9 photographs you've seen of steamboats on the Gila?

10 A. If I had them, you would have seen them
11 yesterday.

12 Q. So as far as you know, none exist?

13 A. As far as I know.

14 Q. And there are several different photos of
15 steamboats on the Colorado, right?

16 A. True.

17 Q. There's photos, there's drawings, there's
18 several different things.

19 A. Yes.

20 Q. Go over to Page 50. This is in your boating
21 PowerPoint. Here are some more pictures of boats. Any
22 of the boats in this picture, can you say with certainty
23 as you sit here today that any of them were ever used on
24 the Gila River?

25 A. Those particular boats, no.

1 Q. Any of the boats in any of the pictures you
2 have from before statehood, can you say any of them were
3 ever used on the Gila River?

4 A. There are some ferry boats we have pictures of
5 that were on the Gila. Those are the ones that come to
6 mind.

7 Q. Go over to Page 55. I'm going to ask you some
8 questions about the inflatables. I know Mr. Hood
9 covered some of that this morning.

10 I think you testified this morning that 1937
11 was the first inflatable trip through the Grand Canyon?

12 A. That was what was reported in -- says right
13 here, yes.

14 Q. Do you recall Ms. Tellman testifying about
15 inflatables back in 2005?

16 A. Not specifically -- well, in general, but --
17 sure. You need to point me to the text to refresh my
18 memory.

19 Q. I'll help you out. Take a look at the
20 November 16th transcript, 2005, page 115. This is where
21 my recollection, at least -- and if yours is different,
22 tell me. My recollection is she was going through her
23 PowerPoint that had some pictures. I'm going to start
24 reading on Line 14, Page 115. She's talking about a
25 particular picture. She said, "This is from the 1940s.

1 This is the first inflatable boat that we know of in
2 Arizona -- this is the Verde River -- made up of modern
3 artificial rubber, which was developed during World War
4 II. Natural rubber did not turn out to be very useful
5 for inflatable boats in the conditions of being wet and
6 suddenly being very hot and dry."

7 Did I read that correctly?

8 A. You did.

9 Q. And you don't have any information about any
10 boats, inflatables in Arizona before, say, 1937 or 1940,
11 right?

12 A. Just the Whipple Expedition that the
13 Whipple -- Lieutenant Whipple crossing the Colorado
14 River, but not on the Gila.

15 Q. Let's go to Page 61. This is your paradox.
16 And I think I understand your testimony in this where
17 you said, back when there was water in the rivers, there
18 weren't any people. And then when the people came, they
19 basically took all the water out of the rivers so there
20 wasn't any water in the river?

21 A. Well, that's paraphrasing, but it's close.

22 Q. And on 61, slide 61, you show that there are,
23 what, 9,000 and some people in Arizona in 1870?

24 A. Yes.

25 Q. Right?

1 A. Yes.

2 Q. Those folks lived in Arizona. They didn't
3 have cars, right?

4 A. Not in 1870, no.

5 Q. Didn't have trains until sometime in the
6 1870s, right?

7 A. Yeah.

8 Q. Didn't have any other modern forms of
9 transportation, correct?

10 A. Correct.

11 Q. Why wouldn't those folks have needed water
12 transportation, maybe even more than what we need today?

13 A. A lot of them didn't live along the river.
14 Some of the population centers at the time, Tombstone,
15 Tucson, Wickenburg, Prescott, Flagstaff.

16 Q. Phoenix, Yuma?

17 A. Phoenix and Yuma were on a river. Population
18 of Phoenix in 1870 was like 1800 people. Tempe was 130
19 or so. I don't know what Yuma was.

20 Q. If somebody wanted to go from Phoenix to Yuma,
21 they couldn't get on a train, right? Couldn't get in a
22 car?

23 A. Correct.

24 Q. If there was a navigable river running right
25 between the two of them, wouldn't that have been a good

1 way to go?

2 A. Go faster on a horse. Go faster on a
3 stagecoach. Go faster in a wagon. Probably go faster
4 on foot.

5 Q. Doesn't there come some point where the
6 transportation on the river is so slow that it's no
7 longer commercially viable?

8 A. I'm not aware of any court case that says
9 that. Compared to the Pacific Ocean, the current is
10 pretty slow.

11 Q. Doesn't Montana talk about having some
12 things -- they have to be commercially reasonable,
13 commercially viable in the Montana case?

14 A. I don't recall the commercially viable
15 statement.

16 Q. Commercial reality? Remember that when
17 they're talking about the segments?

18 A. I'm not sure.

19 Q. If I'm floating down a river or going down a
20 river and the only way I can do it makes it slower than
21 me walking, would that make it, the river commercially
22 viable?

23 A. Depends on the load. There's no current at
24 all in the Pacific Ocean, and people boat it.

25 Q. There is a current in most rivers though,

1 right?

2 A. There is.

3 Q. Page -- slide 64. And this is again one of
4 your slides about why there wasn't more boating,
5 explaining why there wasn't much boating, and the
6 question I had really was about two-thirds of the way
7 down where you talk about parts of the Gila which were
8 in Mexico until 1853. Do you remember testifying about
9 that some yesterday?

10 A. I do.

11 Q. How does the fact that some of the Gila was in
12 Mexico make it less likely that people would boat, or
13 reasons why people didn't boat, I guess is what you're
14 saying here?

15 A. This is a reason why people were not
16 necessarily going along the Gila because the south side
17 was -- you got cliffed out on the north side, and you
18 had to cross.

19 Q. Don't Mexican folks go in boats, too?

20 A. I suppose they do.

21 Q. Have you seen any accounts of anybody from
22 Mexico using the Gila when it was the border -- when it
23 ran along the border?

24 A. I have no information about the Mexican
25 population, Baja Arizona.

1 Q. Slide 65, you talked some about this
2 yesterday.

3 A. Well, now that you ask about it, it seems like
4 the history that I've read, the population centers that
5 were south of the Gila were in Tucson, in Agua Prieta
6 which is on the other side of Douglas. Those are not on
7 the rivers. Those population centers were not on the
8 Gila -- for whatever reason. Could have been the Indian
9 threat. I have no idea.

10 Q. Tucson is actually on the Santa Cruz that you
11 thought was navigable?

12 A. Not on the Gila.

13 Q. Tucson is on the Santa Cruz though, right?

14 A. I'm aware of that.

15 Q. And the Santa Cruz was one that you thought
16 should have been navigable?

17 A. No.

18 Q. So you don't believe the Santa Cruz was
19 navigable either?

20 A. No.

21 Q. Page -- slide 65. You talked about this some
22 yesterday about, the last bullet point about alternative
23 modes were required to get into and out of Arizona. Do
24 you see that?

25 A. I do.

1 Q. And the Gila actually runs into New Mexico,
2 right?

3 A. Yes.

4 Q. And the route from Yuma, if you could go down
5 the Gila from Phoenix to Yuma, you also could go down
6 the Colorado from Yuma to the Gulf of California and go
7 by water all the way to San Francisco, right?

8 A. You said from Phoenix to Yuma?

9 Q. Yeah.

10 A. On the Salt?

11 Q. Salt and Gila.

12 A. Okay.

13 Q. Yeah. Okay. So if there was a land route --
14 excuse me, if there was a water route from Phoenix to
15 Yuma, then you wouldn't necessarily need an alternative
16 mode of transportation to get out of Arizona because you
17 could stay on water, different kind of boat maybe, stay
18 on water and go all the way to San Francisco?

19 A. In its ordinary and natural condition.

20 Q. Let's go to slide 68. You list the factors
21 involved in the proposition that if the river was
22 navigable, people would have regularly boated it. Do
23 you see that?

24 A. Yes.

25 Q. Flow depth is actually part of the

1 navigability determination, correct?

2 A. That's correct.

3 Q. So it's not really a reason why if the river
4 was navigable, people would have regularly boated it?

5 A. No. The point of this bullet item here is
6 there are many factors, one of which is depth but it was
7 not the only factor.

8 Q. How does depth play into this particular
9 concept that's on the slide?

10 A. I just said, flow depth was one of the factors
11 involved in deciding whether you boat it. Certainly if
12 the water is deep enough, that's a good indication that
13 maybe I could throw a boat in there. If the depth is
14 zero, not too many people are going to throw a boat in
15 there. If the depth is an inch, not too many people are
16 going to throw a boat in there. If there's sufficient
17 depth, somebody might consider, yeah, I might be able to
18 throw a boat in there.

19 That's not your only reason for thinking I
20 think I'm going to boat to Yuma instead of take the
21 train. What else do I have to think about? Well, do I
22 have to boat it? Do I like to boat it? Is it going to
23 be less expensive for me to boat it? And that's the
24 point of the other bullets there. Part of the
25 decision-making process.

1 Q. I still don't understand you. The proposition
2 you're trying to dispel here, it looks like, is if the
3 river was navigable, people would have regularly boated
4 it, correct?

5 A. Correct.

6 Q. And the flow depth is one of the factors to
7 determine whether the river is navigable in the first
8 place, right?

9 A. Yes.

10 Q. Let's go to slide 70. One of the things here
11 you have about reasons why not to boat a navigable
12 river, that the river was remote, no access in 1912.
13 You'd agree with me that wouldn't necessarily apply to
14 the Gila River, would it?

15 A. Parts of the river are difficult to get to.

16 Q. The lower Gila or the middle Gila were pretty
17 accessible, weren't they?

18 A. Not compared to today, but there were ways to
19 get to it, yes.

20 Q. They could be accessed -- if you're right
21 about being navigable, they could be accessed from Yuma
22 by a steamboat, right?

23 A. Parts of Segment 8 --

24 Q. Well --

25 A. -- in its ordinary and natural condition.

1 Q. If everything from New Mexico to California,
2 if the whole thing is navigable like you say it is, then
3 all those segments would have been accessible by boat
4 from Yuma, correct?

5 A. Correct.

6 Q. Do you know whether the road from Tucson to
7 Phoenix in this 1800s period of time actually crossed
8 the Gila?

9 A. I have a map of roads in there, but as I sit
10 here today, I don't know.

11 Q. Do you have any information about whether
12 there was a port on the Gila where the road crossed the
13 river?

14 A. A fort?

15 Q. A port --

16 A. A shipping port --

17 Q. Yes.

18 A. -- or a military fort?

19 Q. Port with a P.

20 A. Got it. I'm not aware of any place called a
21 port.

22 Q. But if there was, people could have gone down
23 the road to the river and then got on the river if it
24 was navigable and gone all the way to Yuma, correct?

25 A. If the river were navigable, yeah, people

1 could take boats down there.

2 Q. Last set of questions. I know the Chairman is
3 wanting to take a break.

4 Page -- slide 79. Do you recall, you said you
5 did a bunch of small minor watercourse studies, right?

6 A. I did.

7 Q. Do you know how many watercourses the
8 Commission has determined the navigability of since it
9 started, roughly?

10 A. I believe there's 39,000 individual
11 watercourses, something like that.

12 Q. And here on slide 79, one of the things you
13 say about the Gila, Salt and Verde Rivers is the
14 continuous regular shallow flow is the only real
15 obstruction to boating?

16 A. Yeah.

17 Q. Wouldn't that be true on all the other 39,000
18 rivers?

19 A. Of course. But this is --

20 MR. MCGINNIS: No more questions. That's all
21 I have.

22 CHAIRMAN NOBLE: We'll take a break. Let's
23 try 15 minutes.

24 (Recessed from 2:35 p.m. to 2:49 p.m.)

25 CHAIRMAN NOBLE: Mr. Murphy, would you like to

1 proceed?

2 MR. MURPHY: Thank you, Mr. Chairman.

3

4 CROSS-EXAMINATION

5 BY MR. MURPHY:

6 Q. Good afternoon, Mr. Fuller. My name is Tom
7 Murphy, and I represent the Gila River Indian Community.
8 I don't believe we've met before, have we?

9 A. No, I don't believe so.

10 Q. Let me start with -- I don't know if you're on
11 the boating or the navigability PowerPoint.

12 A. This is boating.

13 Q. Why don't we stick with the boating then, and
14 if you could go to slide number 3, I will begin.

15 And in this slide you outline what the federal
16 standard for title navigability is, correct?

17 A. Correct.

18 Q. Now, I know you have the phrase "on water"
19 underlined; but if I read the Arizona Revised Statute
20 next to it, it indicates that navigable or navigable
21 watercourse means a watercourse that was in existence on
22 February 14, 1912, and at the time was used or
23 susceptible to being used in its ordinary and natural
24 condition as a highway for commerce over which trade and
25 travel were or could have been conducted in the

1 customary modes of trade and travel on the water.

2 Now, my question for you is, you indicated
3 that you used the terms boatability and navigability
4 interchangeably in your testimony; is that right?

5 A. I tend to use them that way, yes.

6 Q. But boatability is not navigability, is it?

7 A. How so?

8 Q. Well, boatability basically gives meaning to
9 travel on water but does nothing for trade on water,
10 right?

11 A. Is travel not trade?

12 Q. So you're saying travel and trade are the same
13 thing?

14 A. They can be.

15 Q. How so?

16 A. Travel is -- paying for travel? You could be
17 engaging in travel for the reason of performing trade.
18 I think, for example, of the Kolb brothers who traveled
19 down the Grand Canyon taking pictures with the intent to
20 sell those, lecture circuit and whatnot, and sell the
21 movies, continued to sell to people like royalties, I
22 guess, off those movies. If I sat here longer, I could
23 think of other instances. You're asking me for legal
24 interpretations of this meaning, meaning of this
25 statement here. I'm no attorney.

1 Q. Okay. Commerce is business, right?

2 A. Commerce, yeah, what exactly commerce means in
3 terms of what you mean by business? What do you mean by
4 business?

5 Q. Well, I mean, it's your slide. Highway for
6 commerce, what does that mean?

7 A. Corridor. I would interpret this to be a
8 corridor over which some sort of activity could occur.
9 Yeah, there's certainly some overlap between business
10 and commerce. I'm not really prepared to debate the
11 meanings of those two words. I have a general
12 understanding that rivers being used for commerce is
13 discussed on this particular slide here where I talk
14 about these are typical trade and travel uses.

15 Q. Okay. Let's stay on this slide since you did
16 pop it up. How is travel a trade use? Because you have
17 travel listed as a trade and travel use.

18 A. Well, it says trade and travel.

19 Q. Right.

20 A. So travel is addressing the travel part of the
21 trade and travel.

22 Q. Doesn't that mean trade and travel that both
23 occur together?

24 A. I'm not sure that it does.

25 Q. Well, could the test have been articulated

1 trade or travel?

2 A. I suppose it could have.

3 Q. And if we go down this list, some of these
4 things are travel but not trade, right? For example,
5 carrying mail is using the river to travel, but mail is
6 a government function. It's not trade, right?

7 A. Seems like these days government is involved
8 in a lot of business and commerce. I know one of my
9 biggest competitors is the federal government, so --

10 Q. The Postal Service?

11 A. The federal government has other branches
12 besides the Postal Service.

13 Q. Military. I mean, that's a use of a river for
14 travel, but that's not trade, right?

15 A. I would consider, personally I would consider
16 the military as a commercial activity.

17 Q. Okay. Would you consider survey a commercial
18 activity?

19 A. Yes.

20 Q. Would it be fair to say that in your analysis
21 of the navigability, or in your analysis, I guess, of
22 boating in general, that your focus is primarily on
23 simply the ability of the river to float the boat?

24 A. Focuses primarily on that? I don't know about
25 primarily. But I would say the ability to float a boat

1 would be a key part of a navigability consideration,
2 yeah.

3 Q. Okay. We'll go to slide 12. You talked about
4 historical boat materials, and I know that -- I think it
5 was mentioned earlier that rubber was not commonly
6 available for use until after World War II for boats.
7 Was that --

8 A. I believe the statement was that the chemical
9 composition of rubber, artificial rubber changed around
10 that time and that it made it more durable. That was a
11 statement in one of the reports that was brought up
12 today.

13 Q. And with regard to aluminum, that wasn't
14 widely available until after World War II as well,
15 right?

16 A. No, actually I believe it was 1894 was the
17 citation in one of the documents that was submitted as
18 part of the record. 1894.

19 Q. For what?

20 A. Aluminum boats.

21 Q. Okay. I wasn't really asking about when the
22 boats first appeared. I was talking about the
23 availability of aluminum.

24 A. Like I say, in terms of how widespread it was,
25 I'm just citing articles that said that aluminum boats

1 were available in the 1890s.

2 Q. In determining susceptibility to navigation
3 and in looking at boats, is it your position that if any
4 boat that might be available anywhere in the United
5 States could possibly have been utilized here in
6 Arizona, then that's the boat you go with?

7 A. No.

8 Q. Well, which boat do you pick then?

9 A. You pick the boats that were available as of
10 the time of statehood. I broke my presentation down
11 into several slides here. This one just talks about
12 boat materials that were available. I also had slides
13 that talked about types of boats that were available in
14 and around Arizona. That's really the only point I'm
15 trying to make here. I deliberately excluded boats that
16 were not used around Arizona. There's types of kayaks,
17 for instance, that were probably suitable for Arizona
18 rivers but really weren't used in the Southwest.

19 Q. Well, with regard to some of the catalog
20 materials, I mean, did you go through and determine, you
21 know, where sales were being made of catalog boats?

22 A. No.

23 Q. Some of the boats were kind of pricey, right,
24 for the time period?

25 A. My recollection is they seemed pretty

1 reasonable.

2 Q. Okay. If you would go to slide 52. So this
3 slide talked about the use of canvas folding boats,
4 right?

5 A. Canvas canoes, yes. Folding canvas boat is
6 from the first bullet.

7 Q. Now, with regard to the 20-foot boat that
8 carries 3,000 pounds and costs \$65, I mean, that might
9 be a boat more so than a 9-foot boat that carries 350
10 pounds to have some commercial use, right?

11 A. No.

12 Q. You don't think it would be more likely to
13 have commercial use if it could carry more?

14 A. It would certainly give you a different range
15 of things that you would need to carry, could carry.

16 Q. Any indication that the 20-foot boat that
17 carries 3,000 pounds was ever used on the Gila River?

18 A. No.

19 Q. And again, this would have just been simply a
20 publication that offered over the mail a boat for
21 purchase, right?

22 A. Right.

23 Q. All right. Go to slide 55. And this is where
24 you talked earlier about inflatables, am I correct,
25 which is the first use of an inflatable recognized in

1 Arizona on this slide was 25 years after statehood?

2 A. No. The first use in Arizona would have been
3 Whipple crossing the Colorado in '53.

4 Q. Oh, okay. Any indication that these types of
5 boats were regularly used?

6 A. Again, on Arizona streams, I'm presuming
7 you're asking?

8 Q. Yes.

9 A. (Nods head.)

10 Q. All right.

11 Let's talk for a few minutes then about Native
12 American boating. If you'll go to slide 59. Now, this
13 slide talks about natives using disposable canoes and
14 boats, but this is in a general sense and not specific
15 to any Arizona tribe, right?

16 A. Yes, the boating presentation is intended to
17 apply statewide, not specifically to the Gila River.

18 Q. Well, this isn't even specific to Arizona
19 though, right?

20 A. In and about Arizona, sure.

21 Q. Well, I'm looking at the source, and it says
22 the Bark Canoes and Skin Boats of North America in 1938.

23 A. That's the source, correct.

24 Q. And then the next slide discusses reasons for
25 limited boating by Native Americans, right?

1 A. Yes.

2 Q. And the two quotes that you have on this slide
3 are both from the Special Master report in the Utah
4 case, correct?

5 A. That's correct.

6 Q. That was sometime around 1930?

7 A. Sounds about right.

8 Q. And these quotes were in the context of his
9 determination of navigability of rivers in Utah, right?

10 A. Correct.

11 Q. And the only tribes he references are Navajo
12 and Utes; is that correct?

13 A. That's my understanding, yes.

14 Q. And the rationale that the Special Master
15 provided in 1930 or thereabouts with regard to Navajos
16 and Utes, are you suggesting that it could be
17 generalized to the tribes in Arizona along the Gila
18 River?

19 A. I guess all I'm suggesting here is that there
20 are other potential reasons for having a limited record
21 in the archaeology by saying that I'm acknowledging
22 right up front there is a limited record.

23 Q. A number of tribes have really strong oral
24 traditions, right?

25 A. Yes.

1 Q. Are you aware of any of the stories or oral
2 traditions among the tribes in Arizona along the Gila
3 River?

4 A. Only in what I've read in the navigability
5 reports.

6 Q. Is there any indication -- and would it be
7 fair to say that the tribes at Gila River Indian
8 Community, which are the Akimel O'otham and the
9 Pee-Posh, at least with regard to the Akimel O'otham,
10 they resided along the Gila River for thousands of
11 years, right?

12 A. That's my understanding.

13 Q. And in those thousands of years and in all the
14 information collected, is there any indication that they
15 regularly boated the Gila River?

16 A. No, I believe that's the point of the slide
17 here that there's not much record at all.

18 Q. Well, those tribes at this point have been
19 studied extensively, right?

20 A. I'm sure there have been many studies.

21 Q. And presumably, those studies would include
22 the practices of the Native Americans, right?

23 A. Yeah, I guess I'm not in a position to say one
24 way or the other whether every fact that could possibly
25 be known about these tribes is currently known.

1 Q. So are you aware of any cultural beliefs about
2 rivers that the Apache, the Akimel O'otham or the
3 Pee-Posh might have that would preclude the use of the
4 river for boating?

5 A. I'm not.

6 Q. When I say river, I mean the Gila River.

7 A. I am not.

8 Q. Would it be fair to say that if those tribes
9 had engaged in boating in prehistoric times as a
10 cultural tradition, that they would have likely
11 maintained that cultural tradition?

12 A. I don't know about likely, but it's certainly
13 possible. I guess it wouldn't be surprising.

14 Q. We'll go to slide 61. One of the arguments
15 that you've made or I should say one of the things that
16 you have testified to is when the rivers had the water,
17 Arizona didn't have the population, and you note in 1870
18 that the population of Arizona was about, is it 9658?

19 A. That's correct.

20 Q. That didn't count though natives, right?

21 A. I have no idea whether it did or didn't.

22 Q. And so you wouldn't know whether or not
23 natives were counted in the census beginning in 1900?

24 A. I would not.

25 Q. Would you know that the population of the Gila

1 River area in Maricopa and Pinal Counties in 1900 was
2 about 5000?

3 A. I have no knowledge of that.

4 Q. And that in the San Carlos Apache area,
5 probably around 3,000?

6 A. Similarly, I do not know.

7 Q. It's possible that in 1870 that the native
8 population in Arizona may have been larger than the
9 nonnative population?

10 A. I still don't know.

11 Q. Now, if we assume for the purposes of my
12 question that the native population in 1870 was
13 significant, then -- and that that population was on or
14 near the Gila River, that that would tend to -- I guess
15 that would tend to cut against your argument here,
16 right?

17 A. Not really. Even if you doubled that number,
18 it's still not a lot of people.

19 Q. When you're talking about early population
20 centers in Arizona, you're talking about early nonnative
21 population centers, right?

22 A. That's correct.

23 Q. And if one of your rationales for why there
24 wasn't boating is the people weren't on the river, but
25 if, in fact, there were uncounted individuals who were

1 on the river, you would expect they would be boating
2 them, right?

3 A. I don't think that's a different argument at
4 all. Folks are making the argument if people were
5 there, then they would boat the river. And as I've
6 mentioned, seems like a number of times now, that there
7 are many other reasons for choosing not to boat a
8 navigable river. Today people drive on interstate
9 highways next to the Mississippi River, railroads next
10 to the Mississippi River. Doesn't make a bit of
11 difference whether the Mississippi River is navigable or
12 nonnavigable. There are many reasons for choosing to be
13 on a river or not.

14 Q. Go to slide 67. Now again, this is your
15 explanation for why there weren't more boating accounts
16 on Arizona streams. Some segments of Arizona rivers
17 were not conducive to carrying major tonnage.

18 What you're saying there then is that some
19 segments of Arizona rivers aren't conducive to large
20 commercial use, right?

21 A. Large deep draft boats, that particular type
22 of commercial use, yes.

23 Q. And then the next slide --

24 A. That's bullet or slide --

25 Q. 68, next slide.

1 Now, if you're using navigability and
2 boatability interchangeably, then this slide could be
3 retitled Reasons Why Not to Navigate a Navigable River;
4 would that be fair?

5 A. When I say that I use the terms
6 interchangeably, I'm saying as my practice, I find
7 myself using those terms interchangeably. I understand
8 that navigability as a legal definition, particularly
9 title navigability, and that's why we're sitting here
10 today, just to clarify that point.

11 Q. Now, when you say many factors are involved
12 here, you say flow depth is a factor, and then yesterday
13 I know you testified a few times that depth is a
14 critical element in navigability, right?

15 A. It is.

16 Q. So if flow depth isn't -- does not allow
17 navigation, I mean, that means the river is
18 nonnavigable, right?

19 A. If the river is not deep enough that you can
20 put a boat in it in its ordinary and natural condition
21 for the entire year, let's use that case right now,
22 yeah, sure, it's not navigable.

23 Q. What about one day out of the year? If you
24 could put a boat in a river one day out of 365, does
25 that make the river navigable?

1 A. I had this conversation with Mr. McGinnis just
2 a minute ago, and the answer is no.

3 Q. Now, if you go to the next slide, which I
4 think is 69, you said additional reasons why not to boat
5 a navigable river. If you go down to about two-thirds
6 of the way down, wagon, horse, car, et cetera, are
7 faster. The reason why they would be faster might have
8 to do with the natural condition of the river, right?

9 A. Yeah, I suppose. I can't think of too many
10 rivers that are faster than cars. I can't think of too
11 many rivers that are -- I'm sorry, any rivers that are
12 faster than a railroad.

13 Q. Well, let's talk pre-development, wagon versus
14 river.

15 A. A wagon is faster.

16 Q. If you go down to the next line, it's too cold
17 or hot or rainy or windy. I mean, those are all natural
18 conditions, too, right?

19 A. Yeah. Have you boated a river at all?

20 Q. Yeah.

21 A. You feel the weather more when you're on the
22 water. When you're on your horse and the wind is
23 blowing at you 15 miles an hour, it's not a big deal.
24 When you're in your boat, it's a little extra exercise.

25 Q. Go down to the next slide, which is 70. And I

1 should say with regard to this series of slides on
2 reasons why not to boat a navigable river, these are
3 just in general, not specific to the Gila, right?

4 A. Yes, that's correct.

5 Q. Let's go to slide number 73. In your note at
6 the bottom here you say, actual historical boating is
7 not required to demonstrate title navigability. Only
8 susceptibility to boating is required. Now, the
9 susceptibility standard was developed in the Utah case,
10 right?

11 A. I don't know. You know what, it's in the
12 Daniel Ball case, the Daniel Ball definition, so it must
13 have been prior to that.

14 Q. Go to the next slide, 74. You have a quote
15 from U.S v. Holt. Did you, in terms of the PowerPoint
16 presentation, did you have any assistance in putting
17 this together from anybody else?

18 A. Yes.

19 Q. Who?

20 A. My son helped me with some of the graphics.
21 Certainly those who prepared the previous reports on the
22 Gila River, other boating reports, other materials that
23 had been submitted to me drew heavily on work that was
24 already existing. In terms of this particular
25 PowerPoint this time around, it's dominantly my work. I

1 did sit down with the State's attorneys and talk through
2 the slides.

3 Q. If you'll look at the last line of the Holt
4 quote, it says that the stream in its natural and
5 ordinary condition affords a channel for useful
6 commerce. Do you see that?

7 A. I do.

8 Q. And again, for the most part, your
9 presentation doesn't -- I would say on the Gila River --
10 doesn't really address the commerce aspect. It focuses
11 more simply on the use of the river for travel aspect.

12 A. I wouldn't agree with that. I would say that
13 I presented evidence of use of the river for commerce.
14 There was an account of some trappers that had come down
15 the river, and then certainly we talked about the aspect
16 of susceptible for use in navigation.

17 Q. Go to the next slide, which is 76. You refer
18 to these as federal minimum standards for boating, but
19 these aren't really established by law as federal
20 standards, right?

21 A. Not that I'm aware of.

22 Q. They just appear in a study that was paid for
23 by Fish and Wildlife Service, right?

24 A. They do.

25 Q. And I think you told Mr. McGinnis this, but

1 just to confirm, these are the standards that you used
2 when you get to your charts for each of the segments
3 that have the pictures of the little boat or little
4 kayak on them. You're relying on this standard for
5 where you're putting those, right?

6 A. It's part of what I relied on, yes.

7 Q. Okay. And this study that was done in 1978
8 was a study of navigability in relation to modern
9 recreational boating, right?

10 A. Yes. That's my understanding.

11 Q. And so these figures assume modern
12 recreational watercraft, right?

13 A. I don't know that for a fact, but that would
14 be my guess.

15 Q. Now, with regard to the numbers that appear in
16 this chart, the .05 minimum for canoe and kayak, that is
17 in the study labeled as a physical minimum depth for
18 those watercraft, right?

19 A. Yes.

20 Q. It is not a safe minimum depth for those
21 watercraft, right?

22 A. I'm not aware of any safety issues in a half
23 foot of depth; but no, it doesn't say safety in the
24 title.

25 Q. Well, in Appendix A-12 to this study, Mr. Hyra

1 has a chart, and in the chart he has three categories,
2 physical, safety, and optimum. This would be for canoe
3 and kayak. And under depth, under physical, he has 0.5
4 feet. Under safety, he has 1.0 feet. And under
5 optimum, 2.5 feet. My interpretation of that would be
6 that he considers no less than 1.0 feet to be the safe
7 depth for that particular watercraft. Would you agree?

8 A. No.

9 Q. How would you interpret it?

10 A. Having been a boater for quite some time, I
11 can't imagine any particular hazard associated with a
12 half foot depth of flow.

13 Q. Why do you think he used the word "safety"
14 then for one foot?

15 A. I'm not sure.

16 Q. These are minimums, right? Ideally, you want
17 more?

18 A. They are minimums. Sometimes you want more.
19 More than a half foot would be more fun than -- one foot
20 would be more fun than a half foot. Usually.

21 Q. Let's go to slide 108. Now, you cite the PPL
22 Montana case here for the proposition that modern
23 watercraft are meaningfully similar to those in
24 customary use at the time of statehood.

25 Now, PPL Montana also had holdings relative to

1 recreational use as it relates to navigation, right?

2 A. I'm sorry, what do you mean by "had holdings"?

3 Q. The Court addressed the issue of whether
4 navigability could be proved through modern recreational
5 use, right?

6 A. It had a discussion of how modern recreational
7 use should be used, yes.

8 Q. And the Court said no, right?

9 A. No, I didn't interpret it that way at all.

10 Q. So the Court said you could base a
11 navigability determination on modern recreational
12 boating?

13 A. If they were meaningfully similar to the
14 use -- the type of boats that were in use at the time of
15 statehood and the river hadn't materially changed. That
16 was how I read that. And again, I'm not an attorney.
17 So you guys can debate that amongst yourselves.

18 Q. All right. If we could go to your PowerPoint
19 on the Gila. Go to slide number -- I think it's 18. So
20 the question you address in this presentation is whether
21 the flowing part of the river is deep and wide enough to
22 float boats, right?

23 A. Yes.

24 Q. And that's travel, not trade and travel,
25 right?

1 A. Either.

2 Q. Excuse me?

3 A. It could be either.

4 Q. Go to your curve which is slide number 22.

5 Where did the numbers that you used to develop this
6 curved line come from?

7 A. You're talking about this line right here?

8 Q. That's the curved one.

9 A. That would be a yes. Those lines, that line
10 came from the average monthly flow. I believe this is
11 from either the Virden or the Gila River at Clifton.
12 Really there are no numbers here. There's a trend.

13 Q. And you referred to this yesterday, I think,
14 as a generalized curve?

15 A. Yes.

16 Q. Is that -- I mean, is that a fair
17 characterization?

18 A. Yes, it is.

19 Q. If you look at the actual day-to-day numbers
20 at any part of the Gila, it's not necessarily going to
21 be a nice smooth curve, right?

22 A. No.

23 Q. Now, is this curve based upon -- and it's
24 broken down by month, but I'm assuming it's intended to
25 be over a period of years, right?

1 A. It is an average over a period of years.

2 MR. KATZ: Excuse me, what slide number is
3 this?

4 THE WITNESS: 22.

5 MR. MURPHY: 22.

6 BY MR. MURPHY:

7 Q. So for -- the point on this curve for each
8 month, I mean, would this represent an average of
9 medians, an average of means for each of those months,
10 or neither?

11 A. Those are a median day-to-day discharge.

12 Q. Okay.

13 A. It's how these data sets are normally
14 produced, reproduced and discussed.

15 Q. Are you familiar with Searcy Flow Duration
16 Curves?

17 A. I can't see that from here. I know what flow
18 duration curves are.

19 Q. This is from James K. Searcy Flow Duration
20 Curves, 1959. He says, "For most streams the monthly
21 discharges are unsatisfactory for showing variation of
22 flow. The duration curves of annual mean discharges
23 would have little use because their range in variation
24 is comparatively small because only a few values are
25 available for defining the curve." Do you agree with

1 that?

2 A. I think the monthly averages are very
3 representative of how they're being used in this context
4 right here. Normal seasonal variation. The average
5 monthly flow data that are generalized on this curve are
6 not the only flow data. The flow duration data are also
7 shown on this curve. That's the 10 percent, 90 percent,
8 50 percent. So it shows both.

9 Q. Now, in your next slide you talk about the
10 word "unstable." And I know previously in the
11 presentation you discussed the word, I think, "erratic."
12 Was that in there?

13 A. I believe "erratic" is in this presentation as
14 well.

15 Q. And then "unstable." I mean, what was your
16 purpose in addressing these terms?

17 A. In the past hearings and whatnot, the river
18 has been characterized as being erratic and unstable,
19 and I wanted to put those in the proper context. So we
20 could look at that term in its meaning as it relates to
21 navigation on the river as opposed to its meaning
22 relating to use of the river for irrigation or use of
23 the river corridor for building a bridge or something
24 else.

25 Q. Now, you're not suggesting that changes in the

1 river over time are irrelevant, are you?

2 A. Changes in the river over time? What kind of
3 changes are you referring to?

4 Q. Well, I mean in your slide you say all natural
5 rivers change with time -- meandering, sandbars, flood
6 erosion.

7 A. That's true.

8 Q. Now, are you still saying that these things
9 are irrelevant to navigability?

10 A. Yes, navigable -- you can have rivers that are
11 meandering that are navigable. You can have rivers that
12 have sandbars that move around that are navigable. You
13 can have rivers that are subject to flood erosion that
14 are navigable. All of those characteristics and more
15 apply to the Colorado River. They apply to the
16 Mississippi River.

17 Q. In terms of the overall decision that the
18 Commission makes, during pre-development times, the Gila
19 River might be subject to flooding that causes braiding
20 in the channel, you know, causes other changes that I
21 think you told Mr. McGinnis would be considered to be
22 part of the natural condition of the river, right?

23 A. You snuck a couple of questions in there on
24 me. Yes, I did tell Mr. McGinnis that changes due to
25 flooding are part of the natural condition. Flooding

1 itself is not part of the ordinary condition of the
2 river, and we're not really talking about flooding --
3 boating or navigation during flooding periods. We're
4 talking about boating during ordinary and natural
5 conditions of the river.

6 Q. The effects of a flood on the river can last
7 for years, right?

8 A. On the river corridor, sure.

9 Q. Why do you get to pick the river in a
10 condition where it has the channel for saying that it's
11 navigable instead of in a natural condition after a
12 flood when the river is braided?

13 A. The braided part of the river, again, is the
14 flood channel. It's not the low flow channel. There
15 are places where the low flow channel has a braid or
16 two. Dominantly in all the pictures that I've seen, the
17 vast majority of pictures I've seen, the maps that I've
18 seen, the river is not mapped, depicted, photographed as
19 having a braided low flow channel. It has a single
20 channel, and that channel reappears after the floods, or
21 it would if it were still in its ordinary and natural
22 condition.

23 Q. Go to slide number 30. Now, if we don't say
24 erratic or unstable, we can say though that the Gila
25 River is variable, right?

1 A. What about the Gila River is variable? Over
2 its course it's variable, or do you mean at a particular
3 point it's variable?

4 Q. Well, you say that it's variable over its
5 course in Arizona, right?

6 A. In the context of the slide, yes. The geology
7 of the river varies over its length.

8 Q. Now, these factors listed in this slide number
9 30 all can affect navigability, right?

10 A. You're asking specifically related to the Gila
11 River?

12 Q. In general.

13 A. In general, sure. Geology can affect
14 navigability.

15 Q. Channel characteristics can affect
16 navigability?

17 A. Depth and width and channel pattern can affect
18 navigability. Certainly the flow rate can, yes.

19 Q. Let's skip ahead to slide number 51, Segment 6
20 of the Gila River that you've identified as the portion
21 that flows through the Gila River Indian Community,
22 right?

23 A. It does, yes.

24 Q. Now slide 51 here is two maps kind of cobbled
25 together, for lack of a better way to put it?

1 A. Yes.

2 Q. Now, if you look on the right, which is the
3 Florence 1902 map, it shows the Gila River as a single
4 channel, correct?

5 A. Correct.

6 Q. If you look on the left, which is a 1907
7 Sacaton map, it shows the river, I would say meandering.
8 I don't know if the shaded areas would reflect sandy
9 areas. But what is depicted in 1907 is substantially
10 different, right?

11 A. I wouldn't say substantially different. You
12 see in the 1907 map on the left downstream of --

13 Q. Shows meandering, braided, sandy areas, right?

14 A. Not braided, but it definitely shows some bar
15 areas that I would interpret as I read that map they
16 look to me to be sandbars. It would be part, perhaps
17 part of the ordinary high water mark or within the
18 ordinary high water mark but not part of the low flow
19 channel.

20 Q. Now, anything happen between 1902 and 1907
21 that might have caused the river to change?

22 A. Well, there was a -- it continued to have more
23 diversions. There was the 1905 flood which was a large
24 flood.

25 Q. Okay. And even if a flood is not an ordinary

1 event, again, it will impact the natural condition of
2 the river and future navigation, right?

3 A. Flood will impact the river corridor. It will
4 not necessarily impact the navigability of the boating
5 channel. The boating channel could be relocated as a
6 result of a flood. The overall characteristics of the
7 channel are not going to be substantively different in
8 its ordinary and natural condition after a flood.

9 Q. Go to slide 55. Is the red dot supposed to
10 mark the end of the segment?

11 A. Yes.

12 Q. Kind of missed the mark a little bit, didn't
13 it? I mean, at the end of the segment is the confluence
14 of the Gila and the Salt, right?

15 A. Yes.

16 Q. That dot appears to be on the Gila to me.

17 A. I think you're applying a little too high a
18 standard --

19 Q. Oh, okay.

20 A. -- where that dot is located. It's just
21 generally indicative.

22 Q. Your intent though was for the dot to be at
23 the confluence, right?

24 A. Yeah.

25 Q. How much did you take into account on Segment

1 7 the effect of the water that is being put into the
2 river by the 91st Avenue Wastewater Treatment Plant?

3 A. Not at all.

4 Q. That's a lot of water that it puts in though,
5 right?

6 A. It's not part of the ordinary and natural
7 condition.

8 Q. So really that picture that we saw in your
9 presentation that showed the beaver dam was in that
10 general area, right?

11 A. It was, yes.

12 Q. So that's not a picture of the ordinary and
13 natural condition of the Gila River?

14 A. It is not.

15 Q. If we go to slide 90 -- no, 65.

16 A. Had hopes there for a second.

17 Q. Yeah. So one of your findings with regard to
18 archaeology is that there was a reliable and dependable
19 flow based upon a thousand plus years of irrigation,
20 right?

21 A. Yes.

22 Q. Now, the Hohokam though utilized canals,
23 correct?

24 A. I believe they did, yes.

25 Q. And the flow for irrigation is not the same as

1 a flow for navigation, right?

2 A. I'm not exactly sure what you mean by that,
3 but are you saying that -- maybe you could rephrase the
4 question.

5 Q. Well, I mean, you can impound water in a
6 canal, can't you?

7 A. In the bay water in the canal. I suppose you
8 could impound, you could trap -- impound would be to
9 trap. You could trap some water in a canal if you had a
10 gate.

11 Q. And then use it if you need it, right?

12 A. Yeah.

13 Q. Go to slide 72. You talk about the Tohono
14 creation account. That's a reference to the Tohono
15 O'odham Nation, right?

16 A. I believe so.

17 Q. And Tohono O'odham means, roughly means desert
18 people, right?

19 A. I don't know.

20 Q. Now, this account that involves a canoe,
21 basically in that account, Montezuma in preparing for
22 the great flood was told by the Coyote to build a canoe,
23 right?

24 A. That's my understanding.

25 Q. And that flood wiped out everybody and

1 everything?

2 A. Right.

3 Q. Except for Montezuma, correct?

4 A. Yes.

5 Q. And there's no indication of where this took
6 place in that story, right?

7 A. That's correct.

8 Q. No indication of when it took place, right?

9 A. That's correct.

10 Q. I mean, would you consider the story of Noah's
11 arc to be relevant to the navigability of the
12 Mississippi River?

13 A. No, I wouldn't.

14 Q. But you're kind of making the same
15 generalization here, aren't you?

16 A. Really, I'm not saying that Montezuma and his
17 canoe went down the Gila River. What I'm saying, the
18 point I made when I described this was just the
19 existence of a canoe was not something that was unusual
20 or unexpected. They knew what a canoe was. At least
21 they had some legend or story about a canoe.

22 Q. Well, at least in the translation of whatever
23 that account was to English, it became canoe, right?

24 A. There you go.

25 Q. All right.

1 A. I'm not sure -- I can tell you for sure that
2 my decision whether the river is navigable or not is not
3 hanging on the interpretation of the word "canoe" in
4 this particular account.

5 Q. Now, there was a portion in this slide that
6 you took out when it was first submitted to the
7 Commission, and that was a reference to Frank Cushing
8 who found the remains of the canoe, right?

9 A. Yes.

10 Q. Why did you take it out?

11 A. It's on the Salt River.

12 Q. Oh, okay. Go to slide 76. Now, some of these
13 early river descriptions are from newspaper articles,
14 right?

15 A. Yes.

16 Q. Some of them are from histories that are
17 written, correct?

18 A. Yes.

19 Q. Be fair to say that some of the individuals
20 involved in these historical descriptions like to
21 exaggerate?

22 A. I have no, no idea.

23 Q. Let me ask you about generally the newspaper
24 descriptions, because I do want to talk about some of
25 those.

1 Was it your goal to simply assemble as many
2 newspaper articles about the Gila River and its use
3 during that time period as possible, or was there some
4 sort of qualitative analysis of the content of those?
5 What was sort of the decision calculus there?

6 A. The newspaper accounts primarily related to --
7 are you asking about the historical descriptions or the
8 boating accounts? Both?

9 Q. Let's talk about the newspapers.

10 A. Yeah, so there are newspaper articles
11 primarily oriented to boating accounts, and we just
12 searched the archives. We took whatever information was
13 previously generated, was already in the record, and
14 looked for accounts of boating. And did online searches
15 in the archive website where you can search by keyword
16 and picked out by river name, boat, canoe, kayak,
17 whatever sort of boat descriptor we could come up with,
18 and simply read the accounts and put all of the accounts
19 that we found in there. There was no real filter on
20 there with the exception of, I think it was specifically
21 described as being used during the flood, and we did not
22 include those. When it came to historical descriptions,
23 I don't really specifically recall any descriptions that
24 are coming from newspapers, but there really was no
25 filter there. We looked through all the ones we could

1 find.

2 Q. Okay. Slide 79. First of all, can you tell
3 me where the Escalante description on Segment 6 was
4 located?

5 A. You mean what part of Segment 6 they're
6 describing?

7 Q. Yeah.

8 A. No, I cannot.

9 Q. Do you have a citation for the information?

10 A. Somewhere I do, whether I have it with me
11 today. I believe it came out of the Land Department
12 report, but I don't have a page. If you would like me
13 to look it up, I will.

14 Q. No, not today. So de Anza, 1775, the
15 description there says dry, halfway up legs, reaching
16 horses' shoulders. I mean, that all sounds very
17 equivocal to me. I mean, is that how it's intended to
18 sound?

19 A. Equivocal?

20 Q. Well, I mean, the river is halfway up legs but
21 dry. What does that mean?

22 A. That doesn't sound consistent to me at all.
23 That sounds like a contradiction.

24 Q. Okay.

25 A. And that was one of the points I was making in

1 these historical descriptions is that sometimes they are
2 not consistent. Therefore, you need to look at the
3 whole of the descriptions, the whole record, all of them
4 and try to figure out what the general theme is.

5 Q. Didn't de Anza, when he was in what is now the
6 Gila River Indian Community, in that area, didn't he
7 describe the river even in 1775 as dry in some places?

8 A. It says dry right there, yeah. But the
9 complicated part is that he also described it as
10 nondry.

11 Q. Did a member of his party also describe the
12 river as so sandy that in some places the water would
13 sink into the sand and then come out at other places?

14 A. I don't recall having that quote in my
15 presentation, but I have the vaguest recollection of
16 somebody else making a quote along those lines.

17 Q. Let's go to slide 81. Kearny Expedition. The
18 description that Lieutenant William Emory gave of the
19 lower Gila was about a hundred yards wide, a hundred
20 yards wide and flowing gently along the sandy bottom.
21 Wasn't the interpretation of this in your report in 2003
22 that this description implies a braided sandy stream?

23 A. Can you show me in the report where I said
24 that?

25 Q. Sure. I'm on the Roman Numeral VII-6. It's

1 probably the lower Gila. I'll read the passage. It
2 says that Lieutenant William Emory of the Kearny
3 Expedition in 1846 described the lower Gila River as
4 about hundred yards wide and flowing gently along a
5 sandy bottom. However, a rancher described the river
6 near Powers Butte in 1889 as having a well-defined
7 channel with hard sloping banks lined with cottonwood
8 and bushes. The water was clear with five or six feet
9 deep containing fish. The forward description implies a
10 braided sandy stream, whereas the latter suggests a
11 relatively narrow, deep channel. However, the latter
12 description may be of the main flow channel within an
13 overall braided channel.

14 Does that sound accurate at all?

15 A. Yes.

16 MS. HERNBRODE: I'm sorry, Tom, what page was
17 that?

18 MR. MURPHY: VII-6.

19 THE WITNESS: I think that was kind of my
20 point of the discussion of the compound channel. When
21 some people are describing the channel, they're
22 describing something that includes portions where the
23 water isn't, where the water is not, that are dry; and I
24 think for boating purposes we're thinking about where
25 the river is wet.

1 BY MR. MURPHY:

2 Q. Slide 81. Let's try 82. These numbers are
3 small. The Mormon Battalion, as I understand it, was
4 forced to jettison some of their cargo; is that right?

5 A. Yes.

6 Q. I think if you go to slide 83, and then slide
7 84 on the Forty-Niners, I mean, there's no source
8 citations to any of this, is there?

9 A. It all comes from the Land Department report.

10 Q. Okay. If we go to slide 86, the description
11 of Segment 6 in this slide says, low flow, navigation
12 doubtful, completely dry at Pima Villages due to
13 irrigation. And that was over 50 years prior to
14 statehood, right?

15 A. 1849. It also mentions that it's June, July,
16 which would be the seasonal low flow period.

17 Q. And then the next page or next slide -- let's
18 try 88. In 1869 in June the river was dry at Florence,
19 right?

20 A. Yes.

21 Q. This would have been before the pumping in the
22 upper valley, right?

23 A. Yes.

24 Q. So this is the river in its natural condition,
25 right?

1 A. Very close to it.

2 Q. Virgin flow, right?

3 A. Very close to it, yeah.

4 Q. And it's dry?

5 A. Close to the description, yes, in June in
6 1869.

7 Q. Let's go to slide 98. Where does that figure
8 of 1 to 4 feet come from?

9 A. In my reading --

10 Q. Excuse me?

11 A. Finish your question. Sorry.

12 Q. Where does that come from?

13 A. In my reading of the descriptions. I'm just
14 approximating based on the observations.

15 Q. So this slide just reflects sort of
16 generalizations that you're making on the basis of the
17 prior river descriptions, right?

18 A. It's a summary of those descriptions, yes.

19 Q. Let's go to slide 100. I know you talked, I
20 think with Mr. Hood, about the bull hide boats used to
21 cross the river. The wicker baskets and the River of
22 Rafts, I mean, that's essentially two labels for the
23 same thing, right?

24 A. I'm not sure that that's the case. I believe
25 the Spanish explorers described them using rafts. I'm

1 not sure they were wicker baskets. I don't recall the
2 details of that.

3 Q. Okay. You wouldn't know if the reason they
4 referred to it as River of Rafts was because they did
5 observe the wicker baskets, right?

6 A. The citation I'm using just said it was River
7 of Rafts. It did not describe the type.

8 Q. Let's talk about slide 103. The Hood family
9 trip.

10 A. Howard family trip.

11 Q. Howard family trip. Does a boat with wheels
12 count as a boat?

13 A. It's a boat if it floats on water.

14 Q. What if 90 percent of the time it's on the
15 water the wheels are turning? Is that navigating the
16 river or is that pulling a wagon in the river?

17 A. I think I would go back to the Daniel Ball
18 Test and say is it floating, is it on the water, and
19 probably not meeting the criteria of craft that are
20 commonly used. I don't recall a lot of wheeled boats in
21 any of the accounts, and I certainly don't see them in
22 my trips on the river. I'd say if it's being supported
23 by its wheels, then it's a wheeled craft; and if it's
24 being supported by its buoyancy, then it's a boat.

25 Q. Now, again, you haven't made what I would call

1 substantive evaluations of these newspaper accounts,
2 right?

3 A. I don't know what you would call a substantive
4 evaluation of a newspaper account.

5 Q. Well, sometimes, I mean, if you read these
6 newspaper accounts, they may not be internally credible,
7 right?

8 A. Internally credible? I wouldn't say that, in
9 my opinion, I have made substantive interpretations of
10 these. I've looked at as many accounts as I could find.
11 I've looked for fanciful language. I've looked for
12 whether it's tongue-in-cheek. There are articles that
13 are published that I did not include that seem to be
14 tongue-in-cheek. I'm looking for newspaper articles
15 that look like news.

16 Q. Was the baby a boy or a girl?

17 A. There's some discussion about that, and the
18 last report that quotes the father, I believe, as saying
19 it was a boy -- or it was the boy himself.

20 Q. The Pancoast piece that's in the State's
21 evidence says the baby was a girl, right?

22 A. Yeah, whether it's a boy or a girl really
23 isn't substantive as to whether it's navigable or not,
24 so I didn't really focus on that too much. But I know
25 there is some debate about it. There's an article

1 titled something like "Was It a Baby Boy?" or "Is Gila a
2 Boy or a Girl?" or something like that, and that's how
3 I'm aware of the debate. I'm really more interested in
4 the character of the boat.

5 Q. Well, if we don't know if the baby was a boy
6 or a girl, do we know whether the boat had two wheels or
7 four wheels?

8 A. My understanding is they took the wheels off.

9 Q. Oh, okay. The next, which is 104. In this
10 account of "Many Gila Trail Travelers Had Thus Reached
11 the Colorado River," I mean, that's a newspaper account
12 from an unsigned letter, right?

13 A. Yeah, as I mentioned yesterday when I talked
14 about this account, there's very little details
15 associated with this. That's been cited in the record.

16 Q. Let's go to slide 107. This was the Bucky
17 O'Neill account. Now, your slide doesn't say this, but
18 my understanding is the editor of the Phoenix Gazette
19 disputed this claim, right?

20 A. Yeah, my understanding is that Mr. O'Neil said
21 that he made it to Yuma, and the editor said that he had
22 it on good information that he had only made it to Gila
23 Bend.

24 Q. Are you counting this as a successful
25 navigation or not?

1 A. Successful down to Gila Bend. There seems to
2 be concurrence that they made it on down there. I also
3 qualified this account. There's a lot that's unknown
4 here.

5 Q. When you put this slide together, why didn't
6 you put in this slide the fact that a portion of this
7 account was disputed?

8 A. Because I brought it up when we discussed it.

9 Q. Look at the dates at the bottom. Your report
10 indicates that this trip took 6 days, but I'm seeing two
11 citations to a newspaper. One is 11-30. The other is
12 12-3. Can you explain that discrepancy? I mean, that's
13 like three days, right?

14 A. I don't know that I really can explain it.

15 Q. I mean, that might be part of the substantive
16 evaluation of these which would be is the time period
17 that they said credible based upon when the reports are,
18 right?

19 A. Yeah, like I said, there are a number of
20 questions with this report. I don't think in my
21 discussion of it, description of it yesterday -- you'll
22 check the transcript when it comes out -- I don't think
23 you'll find that I was describing this as the most
24 definitive account of boating on the Gila River.

25 Q. The slide before this, which is 106, does the

1 Cotton and Bingham trip, does the source for this
2 indicate that they completed this trip or that they are
3 leaving tomorrow for Yuma by way of the Gila and Salt
4 Rivers?

5 A. I believe this one says that they are leaving
6 tomorrow, and we have no knowledge that they didn't make
7 it. We have no knowledge that they did make it. There
8 were no problems reported anywhere.

9 Q. But why does your slide not say that they were
10 leaving tomorrow? This slide seems to imply that they
11 completed the trip.

12 A. We have no information that they didn't
13 complete the trip. We have no information that they
14 did. I guess when you put up the PowerPoint
15 presentation, you can put on whatever bullets you'd
16 like. That's up to you.

17 Q. Here is my question about the bullets you did
18 or didn't pick. Why are you picking the bullets that
19 seem to indicate these trips were successful, but you
20 seem to not be putting bullet points in that either cast
21 doubt or raise questions about these trips?

22 A. I believe I gave a fair accounting of each of
23 the trips, according to the record. I don't believe I
24 omitted any key facts at all.

25 Q. Are you counting this trip successful or not?

1 A. It's certainly not unsuccessful.

2 Q. Not unsuccessful?

3 A. That's correct.

4 Q. You don't know if they made it.

5 A. You don't know that they didn't.

6 Q. All right. So if somebody takes off on the
7 Gila River and we never hear from them again, that's
8 successfully navigating the river. That's what you just
9 said.

10 A. No, I said it's not unsuccessful is what I
11 just said.

12 Q. Okay. Let me go back to the question though.
13 If somebody takes off on the Gila, and we don't know if
14 they made it or not, is that a successful navigation?

15 A. I'll answer the question again. It's not
16 unsuccessful. That's the limit of the information that
17 I'm taking from it. Is there a place where I said this
18 is a successful trip?

19 Q. Don't you have a slide where you say that all
20 but one of these trips was successful?

21 A. That's our knowledge. That's our knowledge
22 base. Should I throw it in the unsuccessful case
23 because we don't know?

24 Q. Is that good science?

25 A. Yes.

1 Q. To make a conclusion from the absence of
2 information?

3 A. I didn't make a conclusion. You're making a
4 construct here and it's not correct. That's not how I
5 used the data.

6 Q. How many documented instances are there of
7 floating logs on the Gila River?

8 A. One that I'm aware of.

9 Q. Which segment?

10 A. 8.

11 Q. Any idea how many logs or what the size of
12 the --

13 A. No, you saw the citation.

14 Q. If somebody is -- let me ask you, too, about
15 the Sykes trip, and I think you talked with Mr. McGinnis
16 about this. This is slide 108. Now, my
17 understanding -- and I think you said this to
18 Mr. McGinnis -- is that most of the time it was one guy
19 in the boat, one guy walking along on the river bank,
20 right?

21 A. No, that's not what I said. That's what's in
22 Barbara Tellman's discussion about this trip or a trip
23 by another Sykes. What I said was I was unaware of
24 where she got that information.

25 Q. Oh, okay. So where did you get the

1 information?

2 A. Coconino Sun.

3 Q. And is that this article, "Story of Boating
4 Trip Across Desert Told by Local Oldtimer"?

5 A. Yes.

6 Q. And this says, "There was not what could be
7 called too much water even here, but most of the time
8 one of us could stay in the boat. The other one walked
9 along the bank with a gun, occasionally getting a shot
10 at a quail or rabbit with consequent improvement of the
11 grub pile."

12 A. One of them was hunting and one of them was
13 boating.

14 Q. And not out of necessity for hunting, but
15 because one had to stay -- only one could be in the
16 boat, right?

17 A. Could you read that back to me?

18 Q. "There was not what could be called too much
19 water even here, but most of the time one of us could
20 stay in the boat."

21 A. Okay.

22 Q. That didn't make it to your slide either, did
23 it?

24 A. It did not.

25 Q. If one person is in a boat and one person is

1 walking on the river but the intent is for two people to
2 be in the boat, is that a successful navigation of the
3 river?

4 A. It's successful for one person. Perhaps they
5 overloaded that particular boat with their gear.
6 Perhaps the boat was unwieldy.

7 CHAIRMAN NOBLE: Mr. Murphy.

8 MR. MURPHY: Yes?

9 CHAIRMAN NOBLE: Would this be a convenient
10 time to take a break?

11 MR. MURPHY: Sure.

12 CHAIRMAN NOBLE: Thank you. Let's try ten
13 minutes.

14 (Recessed from 3:56 p.m. to 4:06 p.m.)

15 CHAIRMAN NOBLE: Mr. Murphy, please proceed.

16 BY MR. MURPHY:

17 Q. Let's look at slide 118.

18 A. I would like to point out before we leave
19 slide 108, that if you notice in the bullets -- there's
20 the implication you're making that I'm leaving out
21 specific pieces of information. I would invite you to
22 reread the bullets on this slide. I don't believe
23 they're all favorable to navigability. I do point out
24 that there were dry reaches until they got to the Gila.

25 I would also point out in regard to your

1 conversation about one of them walking alongside, they
2 do point out that after the dam it was normal water and
3 they made pretty good time down to Yuma. So the bulk of
4 their trip their description was that they made pretty
5 good time.

6 Q. Okay. Thank you. Let's look at 118. This
7 talks about other accounts of historical boating on the
8 Gila. The 1883 account states that the Gila has been
9 navigated to its junction with the Santa Cruz. Now, if
10 you go look at that newspaper article and pull it up,
11 the first line of this reads, "A California
12 correspondent wishes to know if the Gila and Santa Cruz
13 Rivers are navigable to Tucson. Yes." Does that make
14 sense to you?

15 A. They are not.

16 Q. Now, when you hear something like that or when
17 you read this, I mean, doesn't that cast doubt in your
18 mind about the veracity of this article? It makes no
19 sense, right?

20 A. With regard to the getting to Tucson, yeah.

21 Q. But yet the line you pick out of this article
22 is the Gila has been navigated to its junction with the
23 Santa Cruz.

24 A. The Gila doesn't go to Tucson, so boating to
25 Tucson is irrelevant to the Gila River presentation.

1 Q. Okay. So you picked out the part that made
2 sense, and you left out the part that didn't make sense?

3 A. I picked out the part that related to the Gila
4 River. The part that didn't relate --

5 Q. No, no, this says a California correspondent
6 wishes to know if the Gila and Santa Cruz Rivers are
7 navigable to Tucson.

8 A. Can you show me the article?

9 Q. What?

10 A. Can you show me the article?

11 Q. Yeah. Here, I'll just read the whole thing.
12 It's small.

13 A. Can I look at it myself?

14 Q. Sure.

15 MS. HERNBRODE: Do you have the exhibit
16 number?

17 MR. MURPHY: It's whatever yours would be, the
18 Arizona Weekly Citizen in 1883.

19 MS. HERNBRODE: I was just hoping you knew it
20 off the top of your head, so --

21 MR. MURPHY: No.

22 MS. HERNBRODE: All right.

23 MR. KATZ: You don't have an exhibit number?

24 MR. MURPHY: Nope.

25 THE WITNESS: It's very blurred. I'm not sure

1 I have the whole article here. I don't know its
2 context.

3 BY MR. MURPHY:

4 Q. I mean, you agree though that the first line
5 of that article casts doubt on what I would say is the
6 overall veracity of the article, right?

7 A. Yes.

8 Q. Let's talk about the next example down, the
9 dugout, Clifton to Florence. This guy actually walked
10 from Riverside to Florence, right?

11 A. Yes. I don't know about Riverside, but
12 somewhere in that neighborhood, yeah. He walked a good
13 deal.

14 Q. So really, it should say dugout, Clifton to
15 Riverside, correct? Because that's the part he boated,
16 not the part he boated and walked?

17 A. Yeah, and if you were here yesterday, I spent
18 a good deal of time talking about, pointing that out
19 specifically, that this was an account of an
20 unsuccessful boating adventure, and he did walk out
21 there. Yes, that is something that I discussed in
22 detail yesterday.

23 Q. Okay. Let's go to slide 121. Would it be
24 fair to say that the definition you have here of success
25 and the definition of failure are definitions that were

1 formulated by yourself?

2 A. Yes, they are.

3 Q. And to some extent, the definition of failure
4 you have here is subjective, right?

5 A. I think they're fairly objective standards.
6 If you're saying it's something that I postulated based
7 on my understanding of the record and boating
8 experience, then yeah, there's that.

9 Q. If the navigation of a river is difficult to
10 the point that the individual who navigates it chooses
11 not to do it again, I mean, would you consider that to
12 be a successful navigation?

13 A. Are you talking if the individual -- what you
14 just said to me was if the individual decides not to
15 continue on, is that successful navigation?

16 Q. Well, let me rephrase it this way.

17 Does navigability of a river involve
18 repeatability of travel on the river?

19 A. It certainly should be susceptible to
20 repeatability of travel.

21 Q. Meaning people should do it over and over,
22 right?

23 A. People should be able to do it over and over.

24 Q. In all of these accounts, how many of these
25 accounts involved individuals or groups who repeated

1 their travel along the Gila River after the first time?

2 A. There's James Ohio Pattie who claims to have
3 done it multiple times. We've already discussed that
4 account. I don't need to go back there. There were
5 trappers that came down the Verde to the Salt to the
6 Gila who said they intended to. There were the
7 steamboats that made multiple trips on Segment 8, lower
8 part of the Gila. And as I sit here today thinking
9 through the accounts, my recollection being what it is
10 at 4:00 in the afternoon, I don't recall any others that
11 specifically discuss a repeat trip.

12 Q. And would it be fair to say that in a fair
13 number of the accounts that you do address in your
14 presentation, that there was a failure of the commercial
15 purpose?

16 A. No.

17 Q. In some of these accounts, the cargo capsized
18 or the cargo was lost, right?

19 A. Which accounts are those?

20 Q. I'm trying to remember.

21 A. I can think of one.

22 Q. Which is what?

23 A. The prospector that we were just talking
24 about. The news account of that particular account
25 mentions that it was the result of a sawyer or a

1 strainer that caused his boat to flip, be damaged and
2 lost his load. As I pointed out yesterday, it's
3 basically a rookie mistake. He didn't tie down his
4 load. He didn't pay attention to the strainers, and he
5 had a problem. And again, I put that in the
6 nonsuccessful category.

7 Q. Let's talk about slide 123. Now, your
8 criteria under historical boating episodes being
9 successful were no deaths, no injuries, all but one boat
10 reached its destination, right?

11 A. That's correct.

12 Q. And we know from our discussion that more than
13 one of these instances ended up with boats not reaching
14 the destination, right?

15 A. Which were the other ones?

16 Q. Well, the guy from Clifton walked to Florence,
17 right?

18 A. That's one.

19 Q. The one, Cotton and Bingham, we know they
20 left; we don't know if they got there, right?

21 A. That's correct.

22 Q. That's two.

23 A. I don't think you can put it in the category
24 of not successfully reached there. You don't know that.

25 Q. You don't know that they did, and you're the

1 one saying they're successful, right?

2 A. I'm saying there were no deaths, all but one
3 boat reached its destination. So from the information
4 we have, we only know of one boat that didn't reach its
5 destination.

6 Q. And so unless we know for certain -- I won't
7 go down that road.

8 There may be situations where deaths and
9 boating are an indication of navigability, right?
10 Drowning?

11 A. I would not say that death is an indication of
12 the navigability. I would say the fact that somebody
13 used a boat would be an indication of navigability. A
14 death may be a product, a byproduct of somebody using a
15 boat carelessly or chance got them. Who knows? But the
16 death in itself is not an indication. In fact, when
17 somebody drowns, it doesn't indicate that it's
18 navigable.

19 Q. It indicates there's water in the river,
20 right?

21 A. Certainly does.

22 Q. In all these historical boating episodes, any
23 indication of deaths by drowning?

24 A. I don't recall any. There was a flood boating
25 thing, but again, I'm not -- floods are not part of the

1 ordinary and natural condition.

2 Q. Let's go to slide 148. These are your rating
3 curves for Segment 6 of the Gila which goes through the
4 Gila River Indian Community. First of all, there's no
5 current flow at Olberg, right?

6 A. Typically, no.

7 Q. And what is the impact on any interpretation
8 of this chart that everything in the left-hand column
9 are asterisks?

10 A. There's no flow frequency associated with
11 these flow rates. It is as reported in the Land
12 Department report.

13 Q. So you don't know when at particular times
14 these flows take place?

15 A. No, there's no need.

16 Q. Let's go to slide 153. When you say potential
17 issues with cross section model with regard to
18 Mr. Gookin's model, what do you mean?

19 A. Mr. Gookin provided two cross sections
20 purported to fix the, I guess the basis of his rating
21 curve for a segment of the river that I call Segment 6.
22 It's fairly technical stuff. Ask me if you want further
23 explanation. He used an "n" value of .02. I think
24 that's far too low for an alluvial stream.

25 Q. A mean value for what?

1 A. An "n" value.

2 Q. An "n" value?

3 A. Of .02 is the roughness coefficient. It's a
4 parameter and an engineering equation used to estimate
5 flow of loss, depth, et cetera. It suggests that a
6 minimum of .035 would be appropriate, and considering
7 the other factors of the channel and the width of his
8 cross section, something above .045 would probably be
9 more realistic.

10 The depths that he is producing in his results
11 are much lower than what we see in the historical
12 observations, particularly for a median flow rate. The
13 section itself doesn't adequately depict the existence
14 of a low flow channel. The number of points used to
15 depict the width of the channel doesn't really pick up
16 the geometry, and then the topo that he's using by
17 necessity -- it's the oldest topo that's available -- is
18 not from the ordinary and natural condition of the
19 river. It's from long after the river has been
20 disturbed.

21 If you look at the depths, for instance, this
22 cross section needs about 20,000 CFS to fill it. At
23 about 10,000 CFS the depth is still less than two feet.
24 If that were representative of the river, it's hard to
25 understand why anybody would need a ferry if at 10,000

1 CFS, which is a pretty large, unusually large flow, if
2 it's less than two feet. So those would be the issues
3 that I would look at both from the parameters used and
4 the results. Having said that though, even with those
5 criticisms of that cross section, the depths that he's
6 projecting there are greater, generally greater than a
7 half foot. In this case it meets the standard of
8 boating.

9 Q. Your column under Kelvin where you have the
10 parentheticals, you have the mean of 1.1 feet, median
11 1.4, and low flow 1.7. Did you get those backwards?

12 A. Looks like I did.

13 Q. Okay. Gila River Segment 4, slide 167. From
14 a scientific perspective, let me ask this. Your
15 conclusion with regard to, I think, most of these
16 segments was they were boatable 90 percent of the time,
17 right? The historical data does not match the fact that
18 these rivers were boated 90 percent of the time, right?

19 A. How so? You mean --

20 Q. You would expect there to be more accounts of
21 boating if indeed these segments were boatable 90
22 percent of the time, right?

23 A. Well, I think I spent a good deal of time
24 yesterday explaining why there were not as many
25 historical accounts as you might suspect, population

1 being one of them, remoteness, and many other reasons.

2 Q. If the history doesn't match your data,
3 certainly we look for explanations, right?

4 A. Yeah, that was actually one of the reasons
5 that I liked the results that came up here is because I
6 think these depths that we're predicting do match the
7 historical descriptions.

8 Q. But one of your concerns would be the data
9 you're using, wouldn't it?

10 A. In what way?

11 Q. Well, if the historical use doesn't match the
12 data that you have, you may want to ask yourself is it
13 the data, right?

14 A. Sure. And I don't think it is the data.

15 Q. I mean, in, you know, one of the methods that
16 I think you cite to for recreational standards for
17 navigability which is Cortell -- I don't know if you're
18 familiar with that -- it's 1976.

19 A. Yes.

20 Q. His methodology involves after you get the
21 data, going out and field checking the data against the
22 stream, right?

23 A. That's a great point. So what I did,
24 particularly --

25 Q. I'm asking whether --

1 A. -- 103 is --

2 Q. I'm asking --

3 A. -- I went out there with my boat --

4 Q. I'm asking --

5 A. -- and put it in the river and determined that
6 the depths that I computed were completely reasonable.
7 In fact, they're probably underestimating the depths.

8 Q. That's fine. But I didn't ask you that. I
9 just said, his method involves getting the data and then
10 field checking the data with actually going out in the
11 field, right?

12 A. You said field checking, and I'm explaining
13 that I did field check it.

14 Q. It's an easy yes or no question.

15 A. I did my field checking with a boat.

16 Q. So your answer is yes?

17 A. I did do field checking, yes.

18 Q. That wasn't my question. My question was, his
19 method involves field checking the data that you
20 obtained with, with -- and your field checking though
21 was not the ordinary and natural condition of the river,
22 right?

23 A. No, it was at the depleted condition. So it
24 was a lower flow rate than the ordinary and natural
25 condition.

1 Q. When you were talking about Segment 4, the
2 gage data indicates Coolidge Dam, but yesterday you
3 mentioned Kelvin. Can you just clarify which it was?

4 A. Kelvin is downstream of Coolidge Dam.

5 Q. Okay. So the data for this would come from
6 the gage at the Coolidge Dam right?

7 A. For Segment 4, yes.

8 Q. Not Kelvin.

9 A. Kelvin would be in Segment 5.

10 Q. All right. Segment 6, slide number 177. What
11 would the source for the data on this graph be?

12 A. Which particular data?

13 Q. Any of it.

14 A. The gage data?

15 Q. Yeah.

16 A. From the gage at Kelvin, the Gila River at
17 Kelvin. It's in the upper right-hand corner; it's noted
18 there. That's where the flow duration data that I'm
19 putting in there. The other data cited on there is --
20 it mentions each of the lines there. I can show you via
21 the mouse.

22 That's the average flow rate that's reported
23 by the Land Department report. That's Mr. Gookin's
24 median flow rate. That's the gage data. That's
25 Mr. Gookin's low flow estimate for pre-development

1 conditions. That's the source of those data. Then the
2 rating curves are also from the Land Department report
3 as well as supplemented by my -- are supplemented from
4 the Land Department. We're in Segment 6, sorry.

5 Q. Let's talk about Segment 7, slide 181. What
6 would the gage data source be for this?

7 A. There's not much gage data here at all. I put
8 in the curving line right here. It's just generalized.
9 Again, I'm putting that in only just to show the normal
10 seasonal fluctuation, and the other data sets are all
11 cited there. As you can see in the upper right-hand
12 corner, the source of the data is the Land Department's
13 report for 2003, Hjalmarson's flow estimate,
14 Mr. Gookin's flow estimate, Land Department's average
15 flow, and Mr. Hjalmarson's base flow condition.

16 Q. Can we go to slide 192. You spent a fair
17 amount of time in your presentation talking about modern
18 recreational boating on the Gila, right?

19 A. I did talk about modern recreational boating.

20 Q. Now, if I go to one of these websites like
21 paddleon.net and I'm a boater, I can actually click on a
22 link there to get flow data, right?

23 A. Probably. It's possible.

24 Q. When you go out to boat, do you just pick any
25 time or do you check the flow data first?

1 A. Typically I check, I check the flow data,
2 yeah.

3 Q. Because you want there to be water there when
4 you go out to boat, right?

5 A. Boating is a lot more fun when you have water,
6 yes.

7 Q. In fact, with regard to recreational boating,
8 you go when there's water and when it's convenient for
9 you, right?

10 A. Yes.

11 Q. And that's not a commercial activity with
12 regard to your boating personally, right?

13 A. Commercial aspects to it, but I'm not paying
14 myself to boat.

15 Q. You indicated that the Needle's Eye run was
16 quite popular, but when I went to paddleon, it states
17 that it's rarely run. Would you disagree with that?

18 A. Yeah, if you talk to Gene who runs the
19 paddleon site, the reason that's not run more than it is
20 is because there are gates that are locked now.

21 Q. When I looked at the paddleon site, too, I saw
22 your name there. Do you contribute to the site?

23 A. I talk to Gene from time to time. I met him
24 for the first time this year. We've communicated in the
25 past just about, hey, how do you get to this river? I

1 think he used, maybe he used some of my pictures. He
2 came along on a trip on that particular segment. First
3 time I met him.

4 Q. Do you contribute to any of these other sites?

5 A. By contribute, I'm just saying we communicate.
6 I don't have any financial, if you're --

7 Q. Do you submit pictures to them?

8 A. No, Gene takes his own pictures. I did give
9 him copies of my pictures, but I'm not sure -- his are
10 much better than mine.

11 Q. Do you submit trip reports?

12 A. No, I don't do those kind of things; and these
13 other things you asked me about, no, I've never
14 contributed to any of those things. Again, by
15 contribute, I mean provide information.

16 Q. If we could go to slide 198. In Arizona
17 versus California, 1931, the Court took judicial notice
18 of the navigability of the Colorado, right?

19 A. I'm going to leave that. You can argue that
20 point with the attorneys. They told me this was the
21 cite that he said to use and I used it.

22 Q. Oh, okay. So you really can't give any
23 context to what's in this slide?

24 A. Not in terms of the Arizona v. California. I
25 can tell you the navigability legislation, as I

1 understand it, says we assert our right to the east half
2 of the Colorado River.

3 Q. Do you know if the Court has ever taken
4 judicial notice that the Gila is navigable?

5 A. I do not.

6 MR. MURPHY: That's all I have, Mr. Chairman.

7 CHAIRMAN NOBLE: Okay. What do we want to do
8 next? Joe, are you up next?

9 MR. SPARKS: Yes, sir, I am.

10 CHAIRMAN NOBLE: And you can get done in ten
11 minutes?

12 MR. SPARKS: No, sir.

13 CHAIRMAN NOBLE: Let's go ahead and get
14 started, if that will be all right.

15 MR. SPARKS: All right.

16 CHAIRMAN NOBLE: Mr. Fuller, how you holding
17 up?

18 THE WITNESS: Keep 'em coming.

19 CHAIRMAN NOBLE: Okay.

20 THE WITNESS: I can sit here as long as you
21 can.

22 CHAIRMAN NOBLE: And shall we, while
23 Mr. Sparks is coming up, let's talk about tomorrow
24 morning.

25 MR. KATZ: Right now it would be our likely

1 intent to call Don Farmer who is a boating expert. I
2 would expect he would be an hour or not very long on
3 direct examination, hour, hour and a half, if that long.
4 I just can't for sure predict. And then he'll have to
5 be cross-examined, and then finish up with Mr. Fuller's
6 cross, if we have any, and pending any redirect, which
7 I'll try to cut down and not repeat too much because
8 we've already heard, because we can do that in briefing
9 or argument later.

10 CHAIRMAN NOBLE: Is there anyone other than
11 Mr. Sparks that intends to have questions for
12 Mr. Fuller?

13 Did I see your hand go up, Mr. Helm? I
14 couldn't see it.

15 MR. HELM: Yes. I can't resist it.

16 MR. SPARKS: Then it's his turn.

17 CHAIRMAN NOBLE: Self-denial is good for you.

18 MR. HELM: I've been quiet for two days. It's
19 a record.

20 CHAIRMAN NOBLE: Then we will go until 4:50,
21 4:55 at the maximum. We need to vacate the room by 5:00
22 p.m., and we will reconvene in the morning at 9:00 a.m.,
23 and we will proceed as it has been outlined by Mr. Katz
24 in the morning. And after we talk to the boating
25 expert, Mr. Farmer -- is it Mr. Farmer, Dr. Farmer?

1 MR. KATZ: Yeah, it's Mister. He's not a
2 scientist.

3 CHAIRMAN NOBLE: Okay. Then Mr. Helm is going
4 to have a shot at Mr. Fuller.

5 Are you ready?

6 MR. SPARKS: Yes, sir, except they forgot to
7 put the telephone book on this chair so I could see over
8 the table, but I'm hanging by my chin here.

9 My name is Joe Sparks, for the record.
10

11 CROSS-EXAMINATION

12 BY MR. SPARKS:

13 Q. And Mr. Fuller, after 21 years, how we doing?

14 A. Older, fatter, grayer.

15 Q. The good news is we still have hair.

16 I have some questions that I -- I know you
17 wouldn't believe me if I said I had a few questions, so
18 I have some questions.

19 A. I would be happy to believe you.

20 Q. And one of the things I wanted to talk with
21 you about, just momentarily, is the Daniel Ball case.
22 And I think that everyone who has been up here so far
23 acknowledged that you're not a lawyer, but I heard you
24 make oral argument a while ago. It sounds like you're
25 picking up some stuff.

1 But in any event, you did read the Daniel Ball
2 case one or more times, right?

3 A. I have seen the Daniel Ball case.

4 Q. What time of day was it?

5 Anyway, what do you recall the case being
6 about?

7 A. I don't recall specifically.

8 Q. Do you know what kind of -- do you know what
9 states it involved?

10 A. Offhand, I do not. I don't recall.

11 Q. What watercourses?

12 A. I do not.

13 Q. An ocean? An ocean meeting a river? Do you
14 remember that, anything about that?

15 A. You can ask me the same question several
16 times. I'm going to tell you I don't recall.

17 Q. You don't remember anything about it?

18 A. I remember the definition here.

19 Q. Well, was the definition for navigability at
20 statehood?

21 A. This is the definition of navigability that
22 I've been given, that I've seen in the state statutes,
23 and that's how I'm using it.

24 Q. So when you cite to the Daniel Ball case, and
25 Mr. Katz asked you if you were familiar with the case,

1 and you said yes, that's the extent of your familiarity
2 is that you know the name, and then you know you've been
3 told to use this definition; is that right?

4 A. That's what I'm recalling at this moment.

5 Q. You think tomorrow you're going to remember it
6 better?

7 A. I certainly could go home and refresh my
8 memory.

9 Q. At the beginning of your testimony of like a
10 month ago -- but it was actually Monday -- I think you
11 mentioned in your PowerPoint and in your verbal
12 testimony that you wouldn't be testifying, you would not
13 be testifying about all the evidence that the State Land
14 Department has submitted for the record; is that
15 correct?

16 A. That's correct.

17 Q. Is there any evidence that the State Land
18 Department has submitted that you're not testifying to
19 that you think would substantially, would provide a
20 material contribution to the understanding of at least
21 Segments 3 and 4 of your description of the Gila River?

22 A. You're asking me if any of the evidence would
23 substantially contribute to determination of
24 navigability in Segments 3 and 4 that I have not talked
25 about already?

1 Q. Yes.

2 A. I can't guarantee you that there isn't a piece
3 of evidence that would possibly contribute, but I feel
4 like the information that I've provided is
5 representative of the information that's available for
6 those segments.

7 Q. What do you think we're doing here today? Why
8 are we having this hearing, from your standpoint?

9 A. We are here to determine navigability of the
10 Gila River or to present evidence for the determination
11 of the navigability of the Gila River.

12 Q. So it's not your -- you don't understand that
13 this may be about whether any one or more segment of the
14 Gila River is navigable?

15 A. That's not what I said.

16 Q. No. I'm understanding what you said and
17 asking you this question. You're not here to help the
18 Commission determine whether any one segment, one or
19 more segments of the Gila River is navigable?

20 A. I don't see how that's a different question
21 than what I answered. But yes, obviously. I presented
22 information on segmentation. So clearly we would be
23 determining by segment navigability.

24 Q. So when you -- you read the Arizona Appellate
25 Court decision about pre-development conditions on the

1 river. Do you recall seeing that?

2 A. The ordinary and natural conditions of the
3 river.

4 Q. About how you would go about determining the
5 ordinary and natural conditions of the river?

6 A. About how I would be doing that?

7 Q. How anyone should go about it.

8 A. Refresh my memory.

9 Q. That's it. That's the question. You
10 remember, either you understand what the Court asked us
11 to do or you don't.

12 A. I understand the Court asked us, directed us
13 to look at the river in its ordinary and natural
14 condition as if dams and diversions did not exist.

15 Q. Now, I was wondering about just exactly why,
16 from your standpoint, why looking at the ordinary and
17 natural conditions that necessarily meant before the
18 date of statehood. Why do you refer to times prior to
19 statehood for that information?

20 A. As of the time of statehood there were dams
21 and diversions in place that had altered the condition
22 of the river. So we're looking at the condition of the
23 river prior to the time when those disturbances existed.

24 Q. I think your testimony here has been that
25 doesn't matter when you look, before or after statehood,

1 or recently. It's all navigable from New Mexico to the
2 confluence with the Colorado River, right?

3 A. I don't believe I've ever testified that today
4 in its existing condition the entire river is navigable.

5 Q. And so to get to that conclusion, you have to
6 add back in water that has been diverted out?

7 A. That's correct.

8 Q. And then when you add the water that's been
9 diverted out, for instance, where do you add the water
10 back in on each of these segments?

11 A. Where do you add it back in?

12 Q. Yeah.

13 A. I don't believe there's an adding back in.
14 It's a -- it's a -- I'm not really sure how to process
15 that question, Mr. Sparks.

16 Q. Well --

17 A. Where you add it back in. You add it back in
18 at the point where it belongs.

19 Q. Okay. Well, that's your term from your report
20 from your slide show here. You add it back in -- that's
21 what you said you do -- to determine how much water has
22 been depleted from the system since prior to statehood.
23 You add it back in. That's what your slide says, right?

24 A. Right.

25 Q. Okay. Where do you add it back in?

1 A. You add it back into the river. You add it
2 back in at the point where it flowed previously.

3 Q. So do you add it back in at a known gaging
4 point that you also use for reference in your report?

5 A. You add it back in over the entire river
6 segment -- not at a particular point, at a -- at which
7 point. It's a line. Again, that's a difficult question
8 to process.

9 Yeah, you put the flow back in the river along
10 the river. You could get various experts that make a
11 computation of the pre-development flow as it relates to
12 reaches, as it relates to specific gage locations, and
13 they're applying those data over those reaches, much in
14 the same way that the modern gage data is measured at a
15 point that applies over a reach.

16 Q. So did you go back and look at a specific
17 gage, say the Calva gage, and decide how much water
18 should be added in to the readings of the Calva gage to
19 adjust it for the pre-development conditions?

20 A. Other folks -- as I mentioned yesterday, my
21 approach was to take the long-term gage record and use
22 that as a minimum estimate, knowing that other expert
23 reports had been submitted that had produced estimates
24 that were higher than those.

25 So if I could relate a rating curve that

1 showed that in the long-term modern record it was
2 generating boating depths, generating sufficient boating
3 depths, and knowing that the pre-development flow was
4 even greater, then I knew the depths were even greater.
5 So it was only just, only more navigable than in the
6 past.

7 Q. So the answer is no, you didn't do that?

8 A. I didn't -- as I said yesterday in my
9 presentation, I did not --

10 Q. I'm trying to get the answer to this question.

11 A. I'm giving you that answer.

12 Q. Did you add the data back in at the Calva gage
13 for the amount of water you felt had been depleted by
14 modern activities?

15 A. I did in the sense that I used the data that
16 other folks had come up with. I felt those estimates to
17 be reasonable. Did I do the computations myself? No.
18 As I pointed out yesterday, I did not do any separate
19 calculations myself.

20 Q. Do you remember when you were testifying about
21 your canoe trips from up by Duncan down to the Safford
22 Bridge?

23 A. Yes.

24 Q. How many times have you done that?

25 A. Once. Once. I've done from Duncan downstream

1 once. From the 91 Bridge down to the Old Safford
2 Bridge, I've done that twice.

3 Q. And did you do a continuous float from Duncan
4 all the way to the Safford Bridge on any one of those
5 occasions?

6 A. No, as I mentioned yesterday, I went from just
7 upstream of the Duncan Bridge down several miles and
8 took out my boat. I drove down near the community of
9 York and put my boat back in and paddled from there.

10 Q. Was there a reason why you took your boat on
11 your vehicle in that, for that stretch?

12 A. Yes. I felt like having observed the river, I
13 wasn't going to learn anything new by going further. I
14 only had one day to do that section of the river.

15 Q. Are you familiar with the area just below
16 Duncan called Cosper's Crossing?

17 A. Not by that name.

18 Q. Well, it's not known by any other name. So in
19 all the cases about the Gila River and studies, Cosper's
20 Crossing is always what it is. Are you familiar with
21 that area?

22 A. As I just mentioned, not by that name. I'm
23 familiar with the area. I've looked at aerial
24 photographs. I've been to portions of the reach. I'm
25 just not aware of that name.

1 Q. Are you aware that the Cospers Crossing is a
2 stretch of the river where the river simply goes dry for
3 long periods of time?

4 A. I'm not.

5 Q. Well, that's one of the situations where if
6 you had a canoe and did that part, you would need
7 wheels. I just wondered about that.

8 A. I've looked at the aerial photographs. I've
9 seen continuous flow from Duncan on down to the Old
10 Safford Bridge from the aeriels that I've looked at. So
11 it may go dry on occasion. I'm not sure that's relevant
12 to the ordinary and natural condition. But that's not
13 the condition that I'm aware of.

14 Q. Are you familiar with the San Jose diversion
15 canal?

16 A. Is that the one that comes out at the head of
17 the Safford Valley?

18 Q. There's two that come out there. Brown Canal
19 and San Jose. Are you familiar with either one?

20 A. I'm aware that they exist.

21 Q. Have you been to them?

22 A. I've been by there. Not stood on the dam. I
23 believe it's no access. And I've looked at it.

24 Q. Have you ever seen any flow below either one
25 of those diversions?

1 A. Yes.

2 Q. How far below?

3 A. The next bridge downstream. When I was there
4 in February, it was flowing out of the Box and it was
5 flowing down to the next bridge, and I'm forgetting the
6 name of the bridge -- something like 16th Street or so
7 where the river dried up, and then further on down it
8 was flowing again.

9 Q. Well, in February, do you know whether they
10 were diverting into the Brown or San Jose at that point?

11 A. I don't know.

12 Q. Do you know what the cropping season is in the
13 upper Gila Valley?

14 A. I don't recall. I believe we have some
15 information on that in the report. I don't recall at
16 this moment.

17 Q. Do you know how the San Jose Canal, the Brown
18 Canal diversion devices work in the river?

19 A. My attention to the modern conditions of the
20 river is a little bit less given the Court's direction
21 to look in the ordinary and natural condition. So I
22 didn't really focus on the operations of nonnatural
23 structures.

24 Q. So you wouldn't have looked at whether the
25 cut-off wall under the dam goes into an impervious layer

1 or bedrock at those locations, right?

2 A. It's impossible for me to look underneath the
3 surface.

4 Q. You didn't look into it, whether they did or
5 not?

6 A. I did not.

7 Q. And if they did go, let's say to an impervious
8 layer, they would be lifting the underflow of the river
9 to the surface so it could be diverted, wouldn't it?

10 A. Again, you're asking about the nonordinary and
11 natural condition of the river, so we did not focus on
12 that.

13 Q. But what I'm trying to figure out is what you
14 did evaluate in determining what you should add back in
15 and why. And are you telling the Commission that you
16 didn't evaluate anything?

17 A. Well, actually, as I mentioned previously, I
18 did not perform unique calculations -- I just said that
19 a second ago -- of what to add back in. I was relying
20 on -- I used the evidence that was produced by other
21 experts, and I'm using the long-term flow records, as I
22 mentioned. So again, I believe you've asked that
23 question. I've answered that question.

24 Q. I think you also mentioned that you used the
25 sum of approximately 22,000 acres of irrigated lands in

1 the upper Gila in order to determine how much had been
2 diverted for agriculture; is that correct?

3 A. Where did I make that statement?

4 Q. I think you did make the statement. No?

5 A. Can you tell me where?

6 Q. No, this is not a pop quiz for me. It's one
7 for you.

8 A. You're asking me -- are you saying that I made
9 a statement? I'm asking you to tell me where I made
10 that statement.

11 Q. Okay. The answer to the question is, do you
12 recall whether or not you made that statement?

13 A. I don't recall as I sit here right now.

14 Q. Do you recall what number you may have used in
15 terms of the irrigated acreage in order to determine
16 whether generally you were in the neighborhood of
17 cultural depletion by irrigation?

18 A. Okay. I've answered this question already,
19 and I'm telling you that I did not do unique
20 calculations for the pre-development hydrology,
21 including about the figuring out diversions. I did not
22 do that. I'm relying on the estimates of other experts,
23 your side's experts, for those numbers.

24 Q. And from the report beginning in 1993 to the
25 present, have you added new, any new information about

1 Stretch 3 -- Segment 3 from the San Carlos boundary
2 which is near Fort Thomas, Arizona, to Coolidge Dam for
3 the record before the Commission?

4 A. Is there new information in that segment? The
5 information that I'm presenting is in the report in the
6 presentation that I gave you. There's a lot of
7 information that the Land Department's attorneys put
8 together. Some of that could apply to that reach. And
9 as I sit here today, I'm not able to be telling you
10 specifically which of those items are that may apply to
11 that particular segment.

12 Q. The same question about Segment 4. Have you
13 provided, since the draft report in 1993, have you
14 provided any new information about the segment of the
15 Gila River that begins at Coolidge Dam and goes to
16 Kelvin which is substantially on the San Carlos
17 Reservation?

18 A. Yes.

19 Q. Do you have any new information?

20 A. Yes.

21 Q. What is it?

22 A. The information would include photographs of
23 our boating trip down that segment. And that would
24 go -- include part of the San Carlos Reservation as well
25 as areas that are off the reservation. You said down to

1 Kelvin, so --

2 Q. In all of the photographs that you put in the
3 report or you showed to the Commission, how many of them
4 are photographs of a trip when you were on the river?

5 A. They're all. The photographs that I showed
6 yesterday I was on that trip.

7 Q. And in the report, those photographs on the
8 river, are you in one of the boats on the river in each
9 of those photographs?

10 A. No. There are some photographs where I'm not
11 in the photograph, if that's what you're asking me; but
12 I was on the trip. I was there. They're my
13 photographs. I took the pictures or my bowman took the
14 pictures.

15 Q. And I think somebody was asking you to try to
16 evaluate the, I guess the level of skill that you
17 thought you perhaps had or do have in terms of boating,
18 and I thought that question was something like,
19 Mr. Fuller, do you know how high "up" is? And so I
20 think that's a difficult one to answer. But I was
21 wondering, are you familiar with the publications that
22 are put out by the BLM and Forest Service and Park
23 Service? One of them would be called River Information
24 Digest for Popular Western Whitewater Boating Rivers
25 managed by the federal agencies?

1 A. I don't recall that one. I may have seen it
2 in the past. As I sit here today, I don't recall having
3 seen it.

4 MR. SPARKS: I'm going to, Your Honor, I mean,
5 Mr. Chairman, may I approach the witness?

6 CHAIRMAN NOBLE: Just don't throw things at
7 him. Is this going to take more than a few minutes?
8 Because we're getting close to wrapping up for today.

9 MR. SPARKS: Well, I'll introduce it, and then
10 if there's any need to follow up, I will.

11 CHAIRMAN NOBLE: Okay. It just depends on how
12 you want to present it.

13 MR. SPARKS: I was trying to do a line of
14 questions that would fit in the time that I thought we
15 had so --

16 CHAIRMAN NOBLE: Joe, you get three minutes,
17 max.

18 BY MR. SPARKS:

19 Q. Okay. If you switch to, I guess it's item 10,
20 Mr. Fuller, says the Gila River -- it's in print. Do
21 you see that?

22 A. Yes.

23 Q. Okay. What this is is a collection of
24 information about the Gila River. There's other rivers.
25 We've just excised the part about the Gila. Then

1 there's a chart that is visible only to an ant which
2 looks like this.

3 A. Yes.

4 Q. And I gave you an enlarged version of that so
5 that you could see what I'm seeing, and then the section
6 held vertically like this. In the section on the right
7 margin it says, Gila River, Arizona; Gila lower; BLM;
8 Gila middle; Gila upper; do you see that?

9 A. Yes.

10 Q. Okay. And you see the part where it says
11 Period Runnable on the left margin?

12 A. Yes.

13 Q. And under Spring, under those four categories
14 of the Gila, all -- that has a box in it, an X in the
15 box all the way across for Spring, right?

16 A. Yes.

17 Q. And it doesn't have any Xs for Summer or Fall.
18 Do you see that?

19 A. That's correct.

20 Q. And it has an X under Gila -- I don't know
21 where under Gila -- but it has an X under Winter for
22 Gila, Arizona. Do you see that?

23 A. I do.

24 Q. Okay. Do you have any -- your testimony would
25 disagree with this river runners' guide, right?

1 A. Yes.

2 Q. And it would disagree because as far as you're
3 concerned, the river under ordinary and natural
4 conditions would be runnable all the time?

5 A. Most of the time, yes.

6 Q. And then down lower there's a section that
7 says small craft, kayaks. It talks about the kinds of
8 boats, and it doesn't have an indication or an X in any
9 of the watercraft boxes except small craft and kayaks,
10 and it has that for the upper Gila, and it says small
11 craft, kayaks, et cetera, correct?

12 A. Yes.

13 Q. And it wouldn't indicate that these federal
14 agencies think that any other watercraft or any other
15 section of the river is appropriate at all, right?

16 A. There's a reason for that.

17 MR. SPARKS: And Your Honor, I --

18 Mr. Chairman, I think that's my three minutes.

19 CHAIRMAN NOBLE: Joe, we appreciate that very
20 much.

21 We'll see everybody in the morning at 9:00
22 a.m.

23 (The proceeding recessed at 5:00 p.m.)

24

25

1 STATE OF ARIZONA)
) SS.
 2 COUNTY OF MARICOPA)

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I, GARY W. HILL, Certified Reporter No. 50812
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 foregoing printed pages constitute a full, true and
 accurate transcript of the proceedings had in the
 foregoing matter, all done to the best of my skill and
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WITNESS my hand this 29th day of June,
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GARY W. HILL, RMR, CRR
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BEFORE THE
ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

IN THE MATTER OF THE NAVIGABILITY)
OF THE GILA RIVER FROM THE NEW) NO. 03-007-NAV
MEXICO BORDER TO THE CONFLUENCE)
WITH THE COLORADO RIVER, GREENLEE,) ADMINISTRATIVE
GRAHAM, GILA, PINAL, MARICOPA AND) HEARING
YUMA COUNTIES, ARIZONA.)
_____)

At: Phoenix, Arizona
Date: June 18, 2014
Filed: July 11, 2014

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1 JONATHAN EDWARD FULLER,
2 called as a witness on behalf of the State Land
3 Department, was examined and testified as follows:
4

5 CROSS-EXAMINATION

6 BY MR. SPARKS:

7 Q. Good morning, Mr. Fuller. My name is Joe
8 Sparks, and with me is co-counsel Julia Kolsrud of our
9 firm, and we represent the San Carlos Apache Tribe, and
10 in some instances it's referred to as the Apache Threat.
11 I don't mean to be threatening, because I'm not. But in
12 the historical literature, sometimes it's referred to
13 that.

14 One of the things I wanted to clear up is I
15 apologize to you for yesterday because I handed you an
16 exhibit that I was trying to get through before the time
17 bell rang, and it was a document that looked like this
18 on the front, and I gave you sort of an expanded version
19 of it so you could actually see it. And there's a
20 couple of things that I felt like, a number of things
21 that I said and asked questions that were not
22 sufficiently courteous to you in the way I went about
23 it. I'm using the excuse as the press of time. But in
24 any event, there's a couple things, one of which is this
25 document isn't your document, is it?

1 A. It is not.

2 Q. And if you look at the document, it refers to
3 whitewater boating rivers; is that correct?

4 A. It is correct.

5 Q. So it doesn't necessarily refer to boating on
6 river conditions that are not in the whitewater
7 condition; is that correct?

8 A. It may not. I'm not familiar with this
9 document.

10 Q. So it doesn't -- it does not seem to purport
11 to represent river conditions in boating at any other
12 time of the year on the Gila River except for spring.
13 Do you agree with that?

14 A. Are you saying that the document says that
15 it's only looking at boating during spring, or you're
16 saying that this document says you can only boat during
17 spring?

18 Q. No, what I'm trying to point out is it doesn't
19 say that -- it doesn't say when you can boat at all. It
20 just says, on that expanded sheet that I gave you, it
21 indicates that spring is the period of time on the Gila
22 River on all four segments when whitewater would be
23 available for whitewater boating and kayak would be the
24 kind of boat you would use at that time.

25 A. I see the season part that you're talking

1 about. I don't see the kayak part.

2 Q. That's partway down at the bottom of the page
3 where it has, on the left side has types of boat?

4 A. Small craft-kayak, et cetera? I do see that
5 line right there. Until you provided this to me
6 yesterday, I had never seen this. I don't know what the
7 context of the document is. I haven't read it in any
8 more detail than looking at this.

9 Q. And I realize that and that's one of the
10 things I felt like was not fair to you. And what I
11 wanted to point out to the Commission is that it
12 doesn't purport to say when or how boating could occur
13 on the Gila River by any other means. Do you agree with
14 that?

15 A. Like I say, I'm unfamiliar with this document.

16 Q. Okay.

17 A. And if you say that's what it says, I have no
18 basis to disagree or agree with that.

19 Q. I wanted to clarify with that.

20 MR. KATZ: Sorry to interrupt, but do we know
21 what exhibit number this might be?

22 MR. BREEDLOVE: X023.

23 MR. KATZ: Thank you.

24 BY MR. SPARKS:

25 Q. Another one of the things I wanted to talk to

1 you about is I think you mentioned -- I need to
2 understand a little, a lot better the part that you
3 played in the production of the report for the
4 navigability of the Gila, and unfortunately, I only have
5 the draft final report. I don't know why we would have
6 a draft final instead of a final, but that's what I
7 have.

8 But one of the things you said during your
9 testimony was that when I asked what additional evidence
10 you had, the State Land Department, and I used the
11 pronoun "you," but I meant the State Land Department,
12 offered up to the Commission in this report as
13 additional evidence on the navigability of the segments
14 of the Gila River; and your response was, well, we did
15 an extensive research into the other kinds of historical
16 references to the river. Do you recall that?

17 A. More or less, yes.

18 Q. Counting on the more part than the less part
19 that, I think you said, were contemporary journals of
20 prior to and around the time of statehood. Is that
21 fair?

22 A. I only recall talking about newspaper
23 articles.

24 Q. In terms of the newspaper articles, are you
25 the one that did the research into the newspaper

1 articles?

2 A. Yes.

3 Q. Do you consider a newspaper article a primary
4 source for purposes of historical writing?

5 A. In this case, I considered it one of the few
6 sources of historical writing regarding boating accounts
7 in Arizona.

8 Q. But in terms of a primary source, the writer
9 of the article would not be the observer of the event in
10 normal circumstances?

11 A. In some cases, that's true. In other cases,
12 not.

13 Q. In the cases of newspaper articles that you
14 offered for evidence, do you recall of any newspaper
15 article where the writer of the newspaper article was
16 the observer?

17 A. Would you like to go through each of the
18 accounts and look at that?

19 Q. I'm sorry?

20 A. Would you like to go through each of the
21 accounts and look at that?

22 Q. I'm just asking if you recall anywhere the
23 author was the primary observer?

24 A. I think in order to answer that question I
25 need to page through the accounts for the Gila River.

1 Q. I'm sorry, I could not hear you.

2 A. In order to answer that question correctly, I
3 believe I need to page through the accounts from the
4 Gila River.

5 Q. Okay. Because of the time right now, I think
6 we're going to go on from that but we may take you up on
7 it after lunch.

8 A. My guess is that most of the newspaper
9 articles were written by newspapermen as opposed to the
10 boater, if that's what you mean by the observer.

11 Q. Well, by primary source, I mean the person
12 who -- I mean the person who actually experienced
13 whatever it was that was reported by the newspaper.

14 A. So, for example, there was a newspaper account
15 in the Yuma area where they had formerly logs were being
16 floated down the river, and now they had put in this
17 boom to collect those logs.

18 Q. Yes.

19 A. In your mind, the observer in that case would
20 be the log rather than the person who is -- the reporter
21 who might have seen that happen?

22 Q. No, that's a little bit too direct. Logs do
23 talk, but you have to be drinking enough tequila to
24 understand them.

25 So I'm just speaking now of, let's say, a

1 human reporter of that experience of snagging the logs
2 with the boom.

3 A. So the reporter may have seen that boom in
4 action and reported on that, you would consider that to
5 be an observer.

6 Q. But in that case, do you know whether the
7 reporter saw it?

8 A. No.

9 Q. In terms of other reports, for instance, I
10 know you don't want to hear about the Patties anymore.
11 But the Pattie report, you said you didn't read that,
12 right?

13 A. Not in its entirety, no. The diary, you're
14 speaking of, right?

15 Q. The diary, yeah. Do you recall when the diary
16 was written?

17 A. Not the specific date, no.

18 Q. Do you recall the date or the year in which
19 Pattie was claiming to have reported that trip, the trip
20 that he took with his son?

21 A. Yeah, the diary is in evidence and it had the
22 date on it, so I'm sorry, I just don't recall the
23 specific dates. I recall that the trappers were here in
24 the 1820s, in that time frame, so --

25 Q. And the reference that's later in the report

1 that attributes to Pattie a statement that he floated
2 from Safford down to Yuma on several occasions, do you
3 know what the date of that report was?

4 A. No, I do not.

5 Q. Do you know when Pattie was in Arizona
6 territory and when he left, or if he ever did?

7 A. It was in the 1820s as I just answered.

8 Q. In the what?

9 A. In the 1820s.

10 Q. So you think he was here in the 1820s and left
11 in the 1820s?

12 A. Yeah, it's in the report, and the exact dates
13 escape me at this moment. They're in the record. I
14 could look them up. If you're really concerned about
15 the exact dates, I'll take the time and dig that out.

16 Q. All right. And then in terms of the other
17 historical documentary references that are made, did you
18 follow-up to determine if the reporter who was obviously
19 not the party who observed the activity, did you
20 follow-up to see what kind of corroboration the reporter
21 used for the information in the newspaper report?

22 A. I'm thinking most of the reporters are long
23 deceased, so checking anything with them seems like a
24 difficult task. In the accounts that we saw, we saw no
25 subsequent documents that discuss their corroboration.

1 I assume that they used normal reporting practices.

2 Q. Yeah, I think you may have interpreted that a
3 little bit more broadly. I was there, I mean, in 1825,
4 but there aren't that many people in the room who were.
5 But I was also there when Noah built his ark. That's
6 the reason I said I was an old boat builder.

7 But by corroboration, I meant that the
8 newspaper report referenced the corroborating sources
9 for the information in the report.

10 A. Some of the reports they include quotes from
11 the boater. In other reports they do not. It's stated
12 as a fact or as an account, it says so-and-so did this.
13 And that's how it's presented.

14 Q. Now, I want to take you to the tests that
15 we're using in terms of navigability, and I believe that
16 yesterday we came to understand that you use the
17 definition of navigability and Daniel Ball, but
18 otherwise, you were not familiar with the facts of the
19 case, and that's a fair statement, isn't it?

20 A. My testimony yesterday was that I didn't, as I
21 sat here, recall the details of that test. I've read it
22 in the past. What I retained from that was this
23 definition of navigability that has since been
24 incorporated into the Arizona legislation and we've been
25 using as a guideline. Other specifics of the case have

1 escaped my mind; some other facts have replaced them in
2 my short-term memory.

3 Q. Do you have your slide available up there so
4 that you can pull up slides that you've referenced
5 yesterday?

6 A. Yes.

7 Q. I had a hard time making the transition from
8 the material that I had worked with to the ones you used
9 in your testimony here. But I'll do the best I can.

10 In the introduction, which is Page 5 of this
11 document right here, I think it would be?

12 A. The boating presentation you're asking me
13 about?

14 Q. Well, let's see.

15 A. It says on the cover there. Boating in
16 Arizona.

17 Q. I'm visually challenged, so it may be repeated
18 there.

19 A. Now you're looking at the Gila River
20 presentation.

21 Q. Okay. Can you see what I've written on the
22 back side of my tie here in terms of the label?

23 A. Yeah, you mentioned that you were trying to be
24 brief today.

25 Q. Okay. There you go. Thank you.

1 Would you mind going to the part that refers
2 to navigability, and just at the beginning on page, a
3 page that doesn't seem to have a page number, but I
4 think it turns out to be 7. Its topic is Terminology?

5 A. I'm there.

6 Q. And I think in order to assist the Commission,
7 you tried to provide some basic information on
8 definitions that would be used both in the
9 interpretation of the language of Daniel Ball and the
10 Arizona statute, and then also in helping them
11 understand what you were talking about; is that fair?

12 A. That's fair.

13 Q. And one of those terms, the first one out
14 there is floodplain, and you provided a floodplain
15 definition; you indicated that there really wasn't a
16 statutory definition for floodplain, correct?

17 A. No, that's incorrect.

18 Q. It's not correct?

19 A. There is no definition for the term
20 "floodplain" in the navigability legislation, but the
21 first bullet there is from a different section of the
22 Arizona Revised Statutes.

23 Q. I'm sorry, I can't hear you.

24 A. The first bullet there, the definition is from
25 ARS 48-3601. So that is part of the statutes. If you,

1 by statutes you mean the navigability of legislation, or
2 just the Arizona Revised Statutes in general.

3 Q. So for your purposes, you think that ARS
4 48-3601, the part that you quoted there is a definition
5 of floodplain?

6 A. It is a definition of floodplain.

7 Q. Okay. That's helpful. And so you went on to
8 explain that the floodplain includes a low flow or main
9 channel that is ordinarily inundated and elevated areas
10 that are less frequently inundated, right?

11 A. That's correct.

12 Q. So in terms of the -- are you familiar with
13 the term "high water mark"?

14 A. Yes, I am.

15 Q. Does a flood, the edge of the floodplain on
16 either side of a river coincide with the high water
17 mark?

18 A. Are you speaking of the ordinary high water
19 mark, or are you just talking about high water marks in
20 general?

21 Q. High water marks in general.

22 A. There are high water marks, are simply
23 indications of previous elevation of waters. So the
24 high water mark on a particular stream might not be a
25 flood. It could be something lower than that. High

1 water mark is just a physical indication of the last, of
2 a previous elevation of the water surface. There's an
3 ordinary high water mark which has a different
4 connotation.

5 Q. And what is the difference -- what's the
6 connotation of the ordinary high water mark?

7 A. Ordinary high water mark has basically three
8 primary characteristics. One is that there's some sort
9 of topographic change. So a bank, if you will, along
10 the stream bottom or some sort of flat surface and
11 there's a topographic break. There's a change in the
12 character of the soils from streambed materials to more
13 upland soils where you have accumulation of fines, some
14 change in the character from the streambed areas to the
15 upland area, and also a change in the vegetation from
16 aquatic or no species to more upland species.

17 Q. In terms of the floodplain, aren't there overt
18 indications of the edge of the floodplain, also?

19 A. The floodplain -- yes, there are overt -- I'll
20 answer that as simply I can. Yes, there are indications
21 of the edge of the floodplain.

22 Q. So for purposes of navigability, which are you
23 referring to in terms of the land over which the State
24 is claiming ownership if the stream is found navigable?

25 A. If the stream is found navigable in Arizona,

1 the claim goes up to the ordinary high water mark.

2 Q. And is the ordinary high water mark something
3 that is governed by the frequency of floods and the
4 intensity of them?

5 A. Ordinary high water mark is defined, as I just
6 explained, it's not tied to a specific frequency of
7 flow.

8 Q. So it might include a 10,000-year
9 precipitation event or a 100-year precipitation event?

10 A. Well, it wouldn't be tied to precipitation
11 events. It would be runoff events, and it would be
12 unlikely to include a 10,000-year event. That would be
13 typically much greater than the ordinary high water
14 mark. I would suggest a 10,000-year event is not
15 ordinary at all.

16 Q. So the flood that may occur on, say, on the
17 statistical frequency of a thousand-year interval,
18 you're saying that the inundation caused by such a flood
19 would not, which may include the floodplain, but would
20 not include the high water mark?

21 A. A thousand --

22 Q. I meant -- pardon me, let me restate that.

23 Let's say a precipitation event on the Gila
24 River that statistically may occur only at an interval
25 of a thousand years would include the ordinary high

1 water mark, but it may also include the edge, outer edge
2 of the floodplain?

3 A. A thousand-year event would very likely
4 inundate and overwhelm the area where the ordinary high
5 water mark was pre-flood and would extend well out into
6 pretty much any floodplain that you could define.

7 Q. And those precipitation events, do you know
8 how they are categorized in terms of frequency and
9 likelihood?

10 A. Precipitation events? Or are you talking
11 about runoff events? Precipitation is rain.

12 Q. Well, let me just include precipitation events
13 which includes snow and, therefore, also runoff from
14 snowmelt and other nonfrozen precipitation.

15 A. Correct. So the distinction -- I'm not trying
16 to make a distinction between rainfall and snow.
17 Obviously, they're both forms of precipitation. I'm
18 trying to distinguish whether you want to know about
19 stuff falling out of the sky or stuff running along the
20 ground.

21 Q. I'm talking about when it starts running on
22 the ground.

23 A. Okay. So we're talking about runoff events.

24 Q. And in fact, if there's a herd of blackbirds
25 flying over and they have a precipitation event, go

1 ahead and include that.

2 A. Fair enough. So for runoff, how they're
3 categorized in terms of frequency? That was your
4 question?

5 Q. Yes, sir.

6 A. So they're generally -- it's a statistical
7 measure and that -- how are they categorized? I'm not
8 exactly sure what you mean by categorized. I'm just
9 going to take a stab at it to move ourselves along here.
10 And they're typically categorized by frequency, often by
11 a term called return periods. You've been speaking of
12 1,000-year flood. You can speak of 100-year flood, a
13 two-year flood. Each of those has a specific
14 statistical chance of being equalled or exceeded in any
15 given year. That's how they're categorized.

16 There are other folks that use categorizations
17 in terms of mega floods, ordinary floods, annual floods.
18 There are different descriptors and categories that
19 could be used.

20 Q. In terms, let's take a 100-year precipitation
21 event and the runoff that's related to it. It doesn't
22 mean that it only happens once in a hundred years, does
23 it?

24 A. No, as I just said, a 100-year event is more
25 correctly termed a one percent chance event, and that

1 means it has a one percent chance of being equalled or
2 exceeded in any given year.

3 Q. And it's sort of like throwing dice. You
4 could actually throw snake eyes five times in a row,
5 right?

6 A. You could.

7 Q. And you could have hundred-year flood events
8 every two days for a while, couldn't you?

9 A. You could certainly have a hundred-year flood
10 in sequential years.

11 Q. You could have them in sequential months,
12 couldn't you?

13 A. You could.

14 Q. Or sequential weeks?

15 A. Depending on the river and the duration of the
16 event, it's possible --

17 Q. Next I would like to go to the --

18 CHAIRMAN NOBLE: Mr. Sparks, could we break
19 for lunch now?

20 MR. SPARKS: Mr. Chairman, I'm confident that
21 you're in charge and we'll do whatever you say.

22 CHAIRMAN NOBLE: I didn't mean to interrupt.

23 MR. SPARKS: That's okay.

24 CHAIRMAN NOBLE: We'll break for lunch now.

25 We'll try for 1:15.

1 (Recessed from 12:00 a.m. to 1:15 p.m.)

2 CHAIRMAN NOBLE: Mr. Sparks, you're back on.

3 BY MR. SPARKS:

4 Q. Mr. Chairman, Members of the Commission,
5 Mr. Fuller, would you please turn to in your navigable
6 PowerPoint to slide number 18.

7 MR. SPARKS: I'm looking for the one that
8 gives common channel patterns. There you go, that one.
9 Which one is that one?

10 MS. KOLSRUD: 16.

11 MR. SPARKS: 16.

12 BY MR. SPARKS:

13 Q. First of all, where on the Gila River are
14 these two pictures taken?

15 A. As I mentioned in my testimony on Monday,
16 neither of these pictures are in Arizona.

17 Q. Okay. So they're just examples of the two
18 kinds of channels that you were talking about?

19 A. That's correct.

20 Q. Looking at the braided channel on the left,
21 are you familiar with the kinds of modifications that,
22 for instance, the Corps of Engineers does on some rivers
23 to provide for a navigation channel in a river such as
24 this one?

25 A. I understand the concept, yes.

1 Q. What are some of the physical techniques that
2 they use to create a reliable navigation channel?

3 A. Dredging would be the primary one.

4 Q. And what are some of the other ones?

5 A. Dams, so that they're going to hold back water
6 and release it at certain rates. Construction of levees
7 would be another.

8 Q. And levees is to confine the spread of the
9 water to a more narrow example than you might see there?

10 A. Yeah, but typically that's used more for flood
11 control than creating navigable channels, but it can be
12 done that way.

13 Q. When you confine, for instance, with levees,
14 the spread of the river, what does that do to the water
15 levels in the river generally?

16 A. Increases it.

17 Q. Increases the depth?

18 A. Yes.

19 Q. How about jetties, are you familiar with
20 those?

21 A. I am.

22 Q. And what do the jetties do?

23 A. They're generally used to prevent lateral
24 erosion of the stream, to point the main channel in a
25 particular area.

1 Q. So if you create jetties into the river, for
2 instance, on both sides, you can direct the flow to a
3 preferred location for channel maintenance?

4 A. You can, yeah.

5 Q. And are you familiar with a navigational
6 barriers in the river to raise the water level to a
7 certain level from a navigation pool above?

8 A. Are you talking about locks?

9 Q. Not yet, but I'm going to get there.

10 A. Okay.

11 Q. Are you familiar with the navigation dams
12 where -- or you might say navigation -- water barriers
13 that raise the level in general of the pool above the
14 dam?

15 A. Yes.

16 Q. And then the way navigation is used there is
17 they usually prepare a series of locks, and what do the
18 locks do?

19 A. A boat goes into the lock area. It's like a
20 water elevator for boats, if you will.

21 Q. And so you can go from a higher elevation to a
22 lower one or lower to higher one?

23 A. Correct.

24 Q. By use of the locks?

25 A. Yes.

1 Q. Are you familiar with the St. Lawrence Seaway?

2 A. A little bit.

3 Q. Somebody asked you about the Niagara Falls, I
4 think that might have been Mr. Katz, but he's from
5 Chicago, and I'm just not sure that he saw it. But one
6 of the things I'm confident he has seen is ocean-going
7 vessels in the area of Chicago and the Great Lakes. Do
8 you have any idea how the ocean-going vessels would have
9 gotten there?

10 A. Yeah, they came up the St. Lawrence Seaway,
11 the Great Lakes. There's different channels that go
12 between the Great Lakes. That's my general
13 understanding of that.

14 Q. And so in aid of navigation, they created
15 actually a series of locks to either raise or lower the
16 water for vessels a step at a time so they could make
17 access to the Great Lakes and also reenter the seaway
18 below those elevations and make it into the Atlantic,
19 right?

20 A. Seems like a reasonable explanation.

21 Q. And in terms of the statute that we are
22 interpreting here, one of the references to
23 navigability, and I'm looking at, I think, Exhibit 2 of
24 your presentation. Could you pull that up? And
25 navigable watercourse means a watercourse that was in

1 existence on February 14, 1912. I'm sure you're aware
2 of that, but that's the date we're talking about. And
3 then it's followed by a comma and a conjunction and
4 says, "and at that time was used." Are you following
5 me?

6 A. Yes, I am.

7 Q. "Or was susceptible to being used." Do you
8 see that?

9 A. I still see it, yes.

10 Q. "In its ordinary and natural condition as a
11 highway for commerce."

12 Have you considered the possibility that that
13 language actually means something, that at that time, at
14 that time on February 14, 1912, that the river was
15 actually susceptible to commerce?

16 A. You're saying the intent of this legislation
17 and the court cases behind it are to limit the condition
18 of navigability to that particular date?

19 Q. I'm asking you if this is a statute -- not the
20 case -- but what I'm asking you is did you consider that
21 those words and that statute meant what they said,
22 namely, on February 14, 1912, the river was either
23 navigated or susceptible of navigation at that time.
24 Did you consider that?

25 A. Did we consider it? Sure, we considered that.

1 Q. And you decided at that time didn't mean at
2 that time?

3 A. The original reports, all of the information
4 we provided was parsed into the period leading up to
5 statehood, for the period of statehood, and the period
6 afterwards so that all three conditions would be
7 addressed long-term. So yes, we did consider that, and
8 we parsed the information out that way. We also note
9 that the next paragraph, sentence, clause says "ordinary
10 and natural condition."

11 Q. Okay. And then after "it was susceptible to
12 being used," there's another clause that said "in its
13 ordinary and natural condition." See that?

14 A. Yes, I do.

15 Q. Have you considered whether or not that
16 language actually means without modifying the river to
17 aid in navigation, such as building detention dams,
18 locks and jetties and dikes along the river without
19 modification?

20 A. No, that's not what I understand that to
21 mean.

22 Q. No, I asked you if you considered the
23 possibility that that's what it meant.

24 A. You're asking me if I considered that this
25 particular clause meant that what the statute was trying

1 to get at, irrespective of any cases, et cetera, court
2 decisions, meant that ordinary and natural meant, not
3 ordinary and not natural meant man-made modifications to
4 the river channel to improve navigation?

5 Q. Well, let me see if I can state it a little
6 bit more clearly, and that is, the river in the
7 condition on that day, without modification by levees or
8 dikes or canals, would have been navigable in fact?

9 A. I didn't understand that to be what ordinary
10 and natural meant, so --

11 Q. Well, you can keep adding those words, if you
12 would, but I'm trying to get to a different part of it.

13 I'm asking you if you considered the
14 possibility that ordinary and natural condition on that
15 date meant that the river could be used for navigation
16 for trade and commerce on that day in that condition
17 without any subsequent modification of the river to
18 enhance its ability to carry navigation for trade and
19 commerce?

20 A. Okay. Well, again, there were a lot of
21 clauses there in your question. So yes, we considered
22 the river in its condition on February 14, 1912. Yes,
23 we considered it in the condition that it actually
24 existed at that time. We certainly considered whether
25 or not there were human modifications or not to the

1 channel. Those conditions, yes, were all considered.

2 Q. Okay. Now, in the part of the question we
3 haven't gotten to apparently yet is what if you and I
4 got together and said, you know what, we can make this
5 river navigable if we simply put up some dikes in
6 certain locations to keep the river from spreading out.
7 Put in some jetties to concentrate the water in the
8 channel that we want to maintain for navigation. And we
9 can maintain, you know, 40 miles of the river channel
10 that way. And if we put in a detention dam partway down
11 and a series of locks, maybe two, we can deal with
12 another 30 feet of the river decline. And from that
13 point on, we can make it another 60 miles down the
14 river. And we said, okay, well, we can do that. We can
15 make this river navigable. So how does that fit with
16 ordinary and natural condition on that date?

17 A. I don't think that would be the ordinary and
18 natural condition on that date.

19 Q. Did you consider that that phrase was a phrase
20 to prevent the kind of construction that I just made of
21 that language?

22 A. That that phrase is oriented at preventing
23 that kind of construction on navigable rivers?

24 Q. Preventing the interpretation of that language
25 to prevent that kind of construction in terms of the

1 interpretation of navigability?

2 A. No, I guess I did not consider that the way
3 you're phrasing it, which to be honest, is a little
4 confusing. But as I understand what you're asking me,
5 no, we did not consider that particular condition.

6 Q. So, if that condition meant prospectively, you
7 cannot use prospective modifications in the future that
8 can actually make this river navigable in determining on
9 that day whether it was navigable for statehood, for
10 title?

11 A. My understanding of the thing that I think
12 you're asking me about is that affects commerce clause
13 navigability and not title navigability.

14 Q. I'm talking about title. I'm also talking
15 about commerce.

16 A. Well, we're doing our study with respect to
17 title navigability, and I'll be completely upfront with
18 you here, arguing the nuances between the different
19 types of navigability is not what I came prepared to do
20 today. That's better left to the attorneys and the
21 courts.

22 Q. Well, what I'm trying to do is understand as
23 an expert, you're a geologist. You're an engineer.
24 You're a hydrologist, and you're versed in the history
25 of this and other rivers. Did you consider -- and I

1 think the answer was no -- the prospective application
2 of that language, ordinary and natural condition?

3 A. We did not consider a river condition that
4 could be improved.

5 Q. Now, this is just a corollary from that. But
6 if we pull back up the -- Item 16, I think it is, again.
7 The picture of the two channels.

8 If you and I got together and said, you know
9 what we could do here? We could get a navigation canal
10 here, and this valley, these two valleys, assuming, are
11 alluvium and digable, and we dig water out upstream here
12 and we could get an 80-mile run on a canal if we just
13 dug the canal up above the floodplain and diverted the
14 water in at that location and we'd have a straight line
15 like the Erie Canal all the way to the bay. What do you
16 think about that? Did you think that would be a
17 prospective modification?

18 A. Well, one, it's irrelevant to the Gila River.
19 I can't think of any case --

20 Q. Look, your objection for relevancy, your
21 lawyer can make those. I'm asking you just to answer
22 the question.

23 A. I'm here to testify about the navigability of
24 the Gila River. That's the nature of my presence. I'm
25 really not the person to argue with you about these

1 conditions that you're proposing. So no, we did not
2 consider whether somewhere on the Gila River you could
3 have built a canal and whether that would have been
4 navigable or not. That condition doesn't exist, so no,
5 we didn't consider it.

6 Q. Okay. Now, are you aware of whether any of
7 the historical materials that you provided for the
8 record talks about whether a canal could have been
9 developed in the upper Gila to serve parts of the area
10 below downstream on the Gila?

11 A. There may be something in the record that
12 talks about that, but it was irrelevant to the kinds of
13 things that I was considering.

14 Q. I don't know, I think this would be slide 25
15 in your navigability.

16 I want to go back to the previous topic for
17 one more question.

18 You went through several efforts to define the
19 critical terms, as I see it, those terms you felt were
20 critical and the definition under the statutes. I
21 didn't see an explanation by you in your PowerPoint that
22 defined what "at that time" meant?

23 A. "At that time"? You're correct, you did not
24 see that.

25 Q. And do you have an understanding or something

1 that underlies the rest of your testimony about what "at
2 that time" meant?

3 A. Again, I think that's something that is more
4 up to the courts to make the final decision on. My
5 understanding of that was that some of you attorneys
6 were arguing for that particular date, that one day of
7 statehood, and others were arguing for a broader period
8 of time as of the time of statehood. So we provided
9 information for both conditions. Personally, it seems
10 more likely if we're talking about ordinary and natural
11 condition that to limit it to one day would not
12 necessarily be representative. So you would need to
13 look at something broader in order to get the context of
14 what ordinary meant. And also you're talking about
15 variations over the course of a year so clearly it's
16 broader than a single day.

17 Q. Broader than a single day, but what about
18 substantially in that period of time, say within a
19 four-year window?

20 A. I think it would -- that might be a reasonable
21 place to start. I think you would also want to look at
22 the specifics of this particular river and that
23 particular time. Was it a period of unusual drought?
24 Was it a period of unusual flooding? Was it ordinary
25 and was it natural?

1 Q. Then in determining about what you were going
2 to present to the Commission about ordinary and natural,
3 you felt like you needed to go to a time before
4 relatively contemporary historical diversions from the
5 river; is that right?

6 A. Yes.

7 Q. And how far back in time did you feel like you
8 needed to go in order to pick up and analyze what was
9 likely the condition of the river in its ordinary and
10 natural condition?

11 A. Well, I think in some respects you don't
12 actually need to go back in time at all. You just need
13 to determine what the flow rates would have been prior
14 to the time when they were no longer natural flow rates.
15 From the hydrology standpoint, you do the
16 reconstructions that you're going to hear about in the
17 rest of the week, I'm sure. Yeah, you develop that
18 hydrology and that's irrespective of a particular date.

19 In terms of identifying a point from the
20 channel itself, there are a number of different ways to
21 do that. I think you'll hear about some of those. It's
22 also a discussion that centers around what the nature of
23 the changes have been since statehood, since more recent
24 man-made disturbances have been in the channel. So I
25 would argue that there is not a specific date that you

1 need to look at. You're looking at a range of things,
2 conditions that depict the ordinary and natural
3 condition.

4 Q. So did -- for any particular location on the
5 river -- you pick a particular date and then try to
6 reconstruct the condition of the river on that date for
7 that location?

8 A. No particular date, no.

9 Q. Did you pick a date -- now I'm going to speak
10 now to Segment 3 and the Calva gage. For the Calva gage
11 and the location, did you pick a particular date in
12 prior history when you tried to reconstruct the river at
13 that point for that purpose?

14 A. No. Not a particular date for any place on
15 the river.

16 Q. And for no place on the river?

17 A. That's correct.

18 Q. Would you turn to, I believe it's slide 25,
19 please? The first statement there is for the Gila
20 River, what are you doing? It says ordinary and natural
21 condition. You say for the Gila River, identify the
22 major change to the river system, and then, and for you
23 that was changes that caused a reduction in flow, right?

24 A. Yes.

25 Q. Did you also consider conditions that may have

1 caused a geological shift in the elevation of the river?

2 A. No. Well, theoretically yes, but I'm unaware
3 of any geologic shifts in the river.

4 Q. Are you aware of an earthquake -- and you know
5 where the Artesia area is in the upper Gila?

6 A. That place name doesn't mean anything to me,
7 but if you pointed on a map, I can tell you.

8 Q. Are you aware of any earthquake that changed
9 the production of water from springs in the upper Gila?

10 A. In the 1890s, I believe it was, was the Aqua
11 Prieta quake. It was just over the border in Mexico
12 that had that kind of impact in southern Arizona.

13 Q. But specifically on the Gila, you're not aware
14 of the effects, if any?

15 A. No.

16 Q. Okay. And then your statement says solution,
17 add back in the lost flow, right?

18 A. Yes, it does.

19 Q. And yesterday I tried to figure out how you
20 decided how much to add back in and where you decided to
21 add it. And I didn't have very much luck -- well, I got
22 answers, I just didn't understand what they were. So
23 being the slow kid that I am, I'll try to be very
24 specific.

25 At the Calva gage on the Gila River in Segment

1 3, did you add back in water at that gage to reproduce
2 what you consider to be the ordinary and natural
3 condition of the river prior to statehood?

4 A. As I've testified to a number of times now, my
5 approach was to use the modern gage record as an
6 absolute minimum. There are other experts here that
7 have done calculations to add back in the flow, if you
8 will, to compute what the ordinary and natural flow
9 rates were. I'm using those experts' data sets. Those
10 numbers are uniformly higher than the numbers that I
11 used.

12 Q. So let me --

13 A. So where they add that back in is at the
14 gages. Those gages are representative of the flow over
15 broader segments of the river.

16 Q. Would you turn to slide 26, please. Up there
17 it says, the relevance of the hydrologic data provided,
18 and the first bullet is gage record underestimates the
19 natural flow rates. Is that your statement?

20 A. Yes, it is.

21 Q. On what authority do you make that statement?

22 A. By simply comparing the numbers.

23 Q. Comparing what numbers?

24 A. The long-term gage records as I've mentioned,
25 they have median flow rates. If I compare those to the

1 estimates of pre-development or pre-depletion flow
2 rates, the gage record numbers are smaller than the
3 pre-development estimates made by others.

4 Q. So it's not -- you clearly don't know what the
5 pre-development flows were, in fact, do you?

6 A. The estimates that were made, I'm relying on
7 the estimates that others have made. I can tell you
8 that I do know for a fact that if you take water out of
9 the river, it will deplete the flow and the discharges
10 will be lower. There's no argument about that.

11 Q. Doesn't that depend on whether you take it out
12 and put it back in or not?

13 A. Clearly, if you take it out, use none of it,
14 and put it right back in, it will be the same.

15 Q. So if you use for the water wheel, take it
16 out, run the water wheel, it goes back, it doesn't
17 deplete the flow, does it?

18 A. I will grant you, for all of the water wheels
19 that existed on the Gila River, that would be a true
20 statement.

21 Q. Do you know whether there was one at San
22 Carlos?

23 A. If it's not changing the flow rate, it doesn't
24 make a difference.

25 Q. Then the gage record underestimates the

1 natural flow rates. Are you familiar with the USGS
2 rating techniques on their gages?

3 A. Yes.

4 Q. And so do you recognize the fact that gages
5 have a range of error in them?

6 A. I certainly do.

7 Q. And the range of error on a gage is considered
8 highly accurate for USGS is what?

9 A. Above five percent.

10 Q. So that can be five percent more?

11 A. Plus or minus.

12 Q. Or minus. And what is the range of gages
13 before they decide they need to get another one and put
14 it in there?

15 A. What is the range of gages?

16 Q. The range, in other words, of accuracy. If
17 you've got one that's ranging 50 percent, plus or minus,
18 is that time to replace the gage or what?

19 A. I'm not sure that would be part of the factor
20 in replacing a gage. It would be many other factors.
21 Usually the river decides for you or property owners.
22 Gages are typically either, you know, excellent, good,
23 or poor. And there are different percentage rates of
24 accuracy. But USGS stream flow data is the best there
25 is. There's not really another game in town.

1 Q. So in terms of your statement, gages, gage
2 record underestimates the natural flow rates; it might
3 also overestimate it, may it not?

4 A. No.

5 Q. Not --

6 A. No.

7 Q. Not possible?

8 A. Not very likely at all. Not within a
9 reasonable scientific probability.

10 Q. Well, within the range of accuracy, if the
11 range is plus or minus five percent, it seems like it's
12 just as likely to be more or less than exactly
13 accurate --

14 A. The only way you would ever get to know
15 that --

16 Q. -- by five percent on either direction. And
17 one side is overestimating it, right?

18 A. The only way you'd have to know to make that
19 kind of a judgment of a comparison would be to use the
20 gage data itself. So you've already contaminated your
21 analysis.

22 So if you take -- the simplest way to do this
23 is just use common sense. Forget all the gage stuff and
24 just say, if I take river water out of the river, it's
25 going to have lower flow. If I'm looking at an estimate

1 that's based on the flow with the water out of the
2 river, it's going to be lower than what it was in its
3 natural condition. That's just common sense.

4 Q. I'm referring to the gage itself. It says,
5 your statement says, gage records underestimates the
6 natural flow rates. Now, it also can overestimate the
7 natural flow rates, no?

8 A. It underestimates relative to the ordinary and
9 natural condition.

10 Q. You're talking about some previous time in
11 history then, not the day, not the day that it's
12 measuring?

13 A. Of course.

14 Q. So the day it's measuring, it can
15 underestimate or overestimate the flow of the river, the
16 natural flow of the river that date, right?

17 A. Okay. I misunderstood your question. I
18 thought we were talking about something else.

19 Yeah, on a given day, yeah, you can have a low
20 estimate or a high estimate.

21 Q. And if it typically -- maybe that gage
22 overstates all the time by five percent; it's
23 overstating the natural flow of the river, isn't it?

24 A. I suppose that's possible, but the USGS is
25 pretty rigorous about trying to evaluate those kind of

1 conditions. They go out and they field check the data,
2 they create those rating curves. They do their best to
3 eliminate those kinds of conditions.

4 Q. I agree with that. I'm talking about the
5 functional fact. And the fact is, they can overestimate
6 the natural flow?

7 A. Theoretically possible that could happen on a
8 given day, yes. What you're talking about there is not
9 what the point of the slide is. It's not the message
10 there.

11 Q. I'm trying to make a different point than your
12 slide is making.

13 I would like to refer to slide 39, please.

14 CHAIRMAN NOBLE: We're ready to proceed,
15 Mr. Sparks.

16 MR. SPARKS: Pardon me, Mr. Fuller, but I
17 can't read the item number. Is that 39?

18 THE WITNESS: Yes, it is.

19 MR. SPARKS: Thank you.

20 BY MR. SPARKS:

21 Q. Would you describe the -- you used the words
22 there, describe the segment of the river called No. 3
23 from the Gila Box to the San Carlos Reservoir, Coolidge
24 Dam, please.

25 A. So the question is would I describe that

1 reach?

2 Q. Yes, using those words there.

3 A. Sure. It's perennial or it was in its
4 ordinary and natural condition. It has a compound
5 channel pattern. It has a pool and riffle pattern with
6 a sand and gravel bed material. The main channel is
7 sinuous, sinuous to meandering, I would say. It occurs
8 within a broad valley of alluvium. There are no rapids
9 or natural obstructions in that reach, and the major
10 tributary is the San Carlos River.

11 Q. Now, one of the things that I don't see here
12 is an observation about whether or not any portion of
13 that reach includes a losing, a part of the stream that
14 is in a losing condition. In other words, loses water
15 from the flow to groundwater surrounding it or
16 underlying it.

17 A. That is correct. You do not see that.

18 Q. Thank you. So is there a reason why there's
19 no reference there?

20 A. Yes, because I discussed it elsewhere in my
21 presentation.

22 Q. And do you discuss whether that losing
23 condition exists in that reach at all?

24 A. Yes, I do.

25 Q. Okay. Where would that be?

1 A. It's a losing stream over the length of its
2 valley, of the river valley, over the length of Segment
3 3.

4 Q. I'm sorry, I did not hear you.

5 A. Segment 3 is a losing reach over its length.

6 Q. And the question I then have is, in
7 calculating what you would add back in to the natural
8 flow to try to figure out what it would have been at
9 Calva, did you calculate in the loss from the river that
10 would have occurred in that zone, that segment?

11 A. Once again, I did not do any unique
12 calculations myself. I relied on the calculations of
13 others. Generally discharges go down in the downstream
14 direction much as they do in the modern gage record.
15 Therefore, yes, that was considered.

16 Q. But you didn't do any calculations to adjust
17 for possible loss from the stream for that purpose?

18 A. I'm not going to change my mind. No, I did
19 not.

20 Q. That wasn't a trick question. I just, you
21 know.

22 A. It's a repeated question about four times now,
23 so --

24 Q. Well, you're better at math than I am.

25 A. Clearly.

1 Q. Would you turn to Exhibit 100. That is a
2 reference to Chiricahua Apaches in Segments 1 through 3.
3 What's the source of that information?

4 A. It was information provided in the Land
5 Department's reports. I believe it was also referenced
6 in the reports by Barbara Tellman. Let's see if I wrote
7 anything else down on that. And those reports would
8 point at the original sources. That's correct.

9 Q. And does that report the original source of
10 the information?

11 A. No, the Land Department reports and the
12 Tellman reports would have references to where that
13 citation comes from.

14 Q. Do you know when I referred to aboriginal
15 territory of southwestern Indian tribes what I'm talking
16 about?

17 A. I have kind of a general understanding of
18 that.

19 Q. Do you know whether the Chiricahua Apache
20 aboriginal territory included the upper Gila River,
21 Sections 1-3?

22 A. I'm relying on the -- I don't have any
23 specific knowledge on the limits of those territories.
24 My understanding from having read those sources that I
25 just cited, that's what their conclusion was.

1 Q. Have you ever seen a bull hide boat?

2 A. I have not.

3 Q. Ever seen a bowl boat?

4 A. A bull boat?

5 Q. B-O-W-L boat. Bowl boat?

6 A. A bow boat?

7 Q. B-O-W-L.

8 A. Bowl boat, sorry. I've seen pictures of what
9 I would consider to be a bowl boat but not in person,
10 no.

11 Q. How about a wicker basket boat?

12 A. Just pictures.

13 Q. Do you think it would be useful for doing,
14 say, anymore than carrying provisions across a river so
15 you didn't get them wet?

16 A. Well, in fact, this slide says they were using
17 those boats to cross the river. Whether, in fact, they
18 would be useful for going other directions, I don't
19 know. Could be.

20 Q. As a river man, how do you think a bowl boat
21 might work on Reach 4?

22 A. I would be willing to give it a try.

23 Q. Especially in Needle's Eye, do you think that
24 would be good?

25 A. Depends on the design of the boat, but I can

1 think of better ways to get through there. Kind of
2 doubt that navigability or not hinges on whether I could
3 take a bowl boat through Reach 4. If it did, I would.

4 Q. I'll tell you what, I'll rig one up and we'll
5 try it.

6 A. Deal. Let's do it tomorrow.

7 Q. It's not like cereal -- you're not Mikey --
8 you won't try just anything. But you would try that?

9 A. I would try that, sure.

10 Q. Okay. Slide 115, please.

11 What reference do you have for that particular
12 trip? What's the source of that?

13 A. Granger, 1983.

14 Q. Granger what? Newspaper, book?

15 A. Granger is a book.

16 Q. A guy standing outside the courthouse, what?

17 A. Granger is an Arizona historian.

18 Q. Do you know when that was published?

19 A. 1983.

20 Q. Did you look at Granger's reference for that
21 particular story to see --

22 A. I looked at the story there, and it says
23 nothing more than that sentence.

24 Q. Turning to slide 136, please. Looking at the
25 Calva reference, first of all, Segment 3, you have some

1 asterisks on the flow rate, on both the flow rate and
2 CFS and at the median and 90 percent range. What does
3 that mean?

4 A. What does the median mean, and what does the
5 90 percent mean?

6 Q. What do the two asterisks mean?

7 A. I see at the bottom there the two asterisks,
8 it says flow rates are from a publication from the USGS.
9 Greg Pope was the lead author from 1998. I didn't have
10 median and a 90 percent flow rate in the report, the
11 original report by the Land Department, so I added that
12 data set in.

13 Q. And for Coolidge, there's not a rate. There's
14 just an asterisk at those two locations?

15 A. That's correct.

16 Q. And that just means you don't have that
17 information?

18 A. It was not in the original report by the Land
19 Department, so we used other sources.

20 Q. Turning to slide 145, please.

21 Look at the part that says Calva. So it's the
22 bottom section, correct?

23 A. I see it.

24 Q. Okay. There is a note on the top width in
25 feet; there's an asterisk there which means what?

1 A. It means the information wasn't provided.

2 Q. And the top width of what wasn't provided?

3 A. Top width of the low flow channel.

4 Q. Is there any width of the low flow channel
5 provided there?

6 A. No. Not to say that it doesn't have a width.
7 I'm saying the information was not in the Land
8 Department report regarding the width.

9 Q. So in order to know the hydrologic depth,
10 wouldn't you need the width of the channel?

11 A. I'm telling you that the value of the top
12 width was not provided in the Land Department report.

13 Q. What I'm asking you then is how did you
14 determine the hydrologic depth for that gage?

15 A. It was from a rating curve that was provided,
16 and, in fact, maybe maximum depth of that, but I could
17 go back and look.

18 Q. So you did not attempt to calculate the width
19 or the nature of the channel at that location?

20 A. No, as I mentioned in my presentation,
21 generally if there's enough depth, there's enough width.
22 You know, it's a ratio of ten to one or greater. So
23 it's, you know, typically probably be more like 40 to
24 one, streams in Arizona.

25 Q. Let's just talk about the location of gages in

1 general. Do you have an understanding of where they are
2 typically located?

3 A. Yes.

4 Q. And what would that be?

5 A. Well, there are a number of constraints of
6 where to put gages. One is principally where do you
7 need flow data. Another is where can you get access to
8 the river. You have to be able to get there and service
9 the gage, maintain it, repair it. Another is where you
10 want to have a decent rating curve where you have some
11 relatively constant relationship between stage and
12 discharge. You want the river to be relatively stable
13 there. These days, you want an area where you've got
14 line of sight so that you can get out either telemetric
15 data or satellite data, be able to see the sky. There
16 are a number of constraints, and it's a menu and you
17 pick from them. You very rarely get everything you
18 want.

19 Q. Is it also a situation where if you have a
20 braided channel upstream from the gage and there's a
21 number of the channels are carrying water, that you
22 prefer to have one where the water is concentrated in
23 one channel?

24 A. Typically, we pick the lowest one, if you
25 could get at it.

1 Q. And is it also preferable to have one where
2 it's the only channel carrying water at that location?

3 A. Given the choice, if you have a choice,
4 picking a single channel over multiple braids, you would
5 pick a single channel, typically.

6 Q. There is a section in the draft report -- and
7 I think it's Appendix I in the final report -- called
8 land ownership, and it has some maps in it. Are those
9 maps in your computer so that you can bring those up?

10 A. They are not.

11 Q. Okay. So none of the maps that show, none of
12 the maps in the final report on land ownership are in
13 your computer?

14 A. Those particular maps are not in my computer,
15 but I'm sitting in front of some maps that have land
16 ownership on them.

17 Q. How about the land use maps, do you have land
18 use maps in your computer?

19 A. I do not have that report in my computer.
20 However, I believe it's an exhibit, somebody's. I
21 looked at it earlier.

22 Q. And the Gila River photography in that report,
23 do you have those photographs?

24 A. I'm telling you I do not have that report in
25 my computer.

1 Q. So there's nothing in your computer except for
2 your PowerPoint presentation?

3 A. There's a lot of things on my computer, but as
4 it relates to these hearings -- you're not going to get
5 into my personal finances.

6 Q. Okay.

7 A. As it relates to these hearings, again, I have
8 the PowerPoint presentation. I have the Google Earth
9 flyovers. I have the field photographs from my canoe
10 trips. I believe that's what I have on there as relates
11 to these hearings.

12 Q. Do you have any of the documents like in the
13 disclosure from the Land Department like document number
14 70, which is entitled Irrigation and Agriculture
15 Practice in Arizona, Tucson, Arizona, June 30, 1911?

16 A. I don't. But I'm sitting next to some
17 attorneys that might.

18 Q. I'm just talking about whether you have it.

19 A. I do not.

20 Q. So it's not something that you worked on?

21 A. No, it's part of the Land Department report.
22 I did the two revisions of it. I doubt that we revised
23 the appendix, but I'm not looking at it, so I don't know
24 specifically. If it's a document that was just
25 included, then no, obviously I wouldn't have revised

1 that document.

2 Q. I just wanted to go for a few minutes to your
3 boating section, your boating report.

4 A. Okay.

5 Q. My page says 8. It's the one that has
6 references to the Missouri on it.

7 A. Okay.

8 Q. You're digging in my backyard when you're
9 talking about the Missouri so you have to be sort of
10 careful. I realize how delicate you are with my
11 feelings but even more delicate here would be good.

12 What I was trying to understand is what the
13 relevance of the 27-year comment is to navigability.

14 A. Yeah, as I mentioned in my presentation and
15 again in cross-examination yesterday, the relevance of
16 the 27 years is that sometimes upon reaching a river
17 with the kind of boats that are available to them at
18 that time, the kind of boats and the skills that they
19 have aren't sufficient to be able to navigate the river.
20 Once you get on the river, you learn some new skills,
21 you make some modifications to a boat, and it takes some
22 time but then you're navigating that river, and that's
23 the point is that it takes time.

24 Q. So do you think -- is there a date certain
25 that you think that 27-year period started on the

1 Missouri?

2 A. No, I don't think that this is -- it was on
3 January 2nd of whatever year it was, and then 27 years,
4 and 265 days later. No, I think 27 years is the
5 generalized statement from this author, but whether it's
6 27 or 26 or 25, I don't know how that's --

7 Q. And so the citation is to this River Boats in
8 America, 1966, is that the source of that statement?

9 A. Yes, it is.

10 Q. So it's not about whether the Missouri was
11 navigable 27 years earlier. It's just how long it took
12 them to figure out how to get mechanized boats up the
13 river?

14 A. Yes. I would think this quote is interesting
15 in that respect. Also interesting, as I pointed out,
16 this author points out that commercial navigation,
17 commercial boating was limited to canoes, flatboats, and
18 keelboats. I thought that was an interesting statement
19 as well, which underscores my own opinion.

20 Q. And then several times during your testimony
21 you've mentioned the skill or experience of the boatman.
22 Do you think that the experience or skill of the boatman
23 has anything to do with whether the river is navigable
24 or not?

25 A. No. It has more to do with how well they

1 boated.

2 Q. Did you look at in the historical data about,
3 or reports about what people in Arizona and elsewhere in
4 the United States thought were the navigable streams in
5 Arizona in 1912?

6 A. I've seen some quotes along those lines, yeah.

7 Q. And do you think that what those parties
8 thought in terms of navigability and potential for
9 navigation and commerce on the river should have weight
10 before this Commission?

11 A. I think any evidence, any discussion of the
12 river's navigability should be included, and I think it
13 should be included in light of court decisions that
14 those observations, those opinions are made for the
15 river in its ordinary and natural condition. And also
16 that they were considering navigability from a title
17 navigability perspective.

18 Q. Do you know of any references at the period of
19 1911, 1912 that you can provide to the Commission that
20 shows what the thinking was at that time about the
21 navigability of the river?

22 A. I think there have been a number of things
23 that have been submitted for people's opinions about the
24 river in 1912. But none that I'm aware of that discuss
25 it in its ordinary and natural condition or that are

1 applying the Daniel Ball Test.

2 Q. Just speaking specifically what their view was
3 on, on or about the time of statehood; namely, at that
4 time, what was their view?

5 A. Which person are you talking about?

6 Q. I'm just asking you if you referred the
7 Commission to any references to the thinking of people
8 involved in river navigation, river use at that time?
9 For instance, are there any scientific papers?

10 A. On the Gila River, I'm not aware of any
11 scientific papers where people were considering the Gila
12 River in its ordinary and natural condition for purposes
13 of title navigability.

14 I'm aware of people who said the river is
15 navigable, Bartlett being one of them. I'm aware of
16 people that said it's not navigable, Bartlett being one
17 of them.

18 So yeah, there are a number of people that
19 rendered opinions. The territorial legislature made
20 some statement regarding the Colorado River being the
21 only navigable river. They don't specifically mention
22 the Gila as being nonnavigable, but by exclusion. There
23 are a number of other things like that. You'll probably
24 hear more of that in the next two days.

25 Q. What about government reports?

1 A. What about government reports?

2 Q. Do you refer the Commission to any government
3 reports discussing the condition of the river in terms
4 of navigability at that time?

5 A. I guess the government reports I would refer
6 the Commission to are the reports that are in our
7 previous two reports and in the presentation right here.
8 I'll limit it to that.

9 Q. When I referred you to the slide about the
10 Calva gage and I pointed out that there wasn't any
11 information about the width of the channel at that
12 location, do you have a general rule or a scientific
13 rule in hydrology or geomorphology about what the width
14 of the channel would be in order to understand the depth
15 of the channel in the context of particular flow?

16 A. Yeah, there are -- you guys are going to love
17 this. There are hydrology geometry equations that
18 describe those kind of relationships. They relate
19 discharge to a power, depth to a power, length, width,
20 and depth. You know, there are relationships that you
21 can use to estimate typical relationships of width and
22 depth.

23 Q. Did you mention in your testimony that you
24 thought there was a 40 to 1 ratio?

25 A. I just said that earlier. I would say that

1 would be a reasonable feel, rule of thumb.

2 Q. Well --

3 A. I'm not sure you're going to find that in a
4 scientific journal anywhere. That's Jon Fuller speaking
5 about Arizona.

6 Q. Okay. And given, let's say, the low flow
7 channel at Calva where you show it to be in the range of
8 a half foot, then you're assuming that at that point the
9 channel was what, 20 feet wide?

10 A. That sounds like about a reasonable estimate,
11 yeah. I would expect that.

12 Q. And what if the channel is a thousand feet
13 wide, what would your result be?

14 A. I don't think we're talking about the same
15 kind of channel.

16 Q. That what?

17 A. We're not talking about the same kind of
18 channel.

19 Q. No, I'm asking you the question. If it was a
20 thousand feet wide, what would the -- the same amount of
21 water, how would it appear in the low flow channel?

22 A. If you're saying that the channel were half --
23 the low flow channel were a half foot deep.

24 Q. No. I'm saying it was a thousand feet wide
25 and you had the same amount of water, how deep would the

1 low flow channel be?

2 A. Well, first of all, that's not the low flow
3 channel. But if that condition somehow magically
4 developed and science is defied, it would be shallow,
5 very shallow.

6 Q. Like would an ant drown in it?

7 A. You know, I'm not here prepared to testify
8 about the swimming abilities of ants.

9 Q. There are some ants that make pretty good
10 boats. But I'm not going, you know, to require you to
11 know that.

12 A. All right. It would be less than a half foot.
13 Is that helpful? It would be, probably be fraction of
14 an inch at thousand feet wide.

15 Q. Ms. Kolsrud has a few questions that she wants
16 to ask that carries on with things that I didn't get to.

17

18

CROSS-EXAMINATION

19 BY MS. KOLSRUD:

20 Q. Actually, I just have a few questions to
21 clarify some stuff that was already asked. I've had to
22 read through all this stuff for the first time, so I
23 have not been privy to the past hearings and know
24 what's, you know, been asked by who and in what kind of
25 manner.

1 Can you bring up slide 80 from your Gila River
2 presentation?

3 A. Yes, I can.

4 Q. I know yesterday that you had said that you
5 hadn't read the James O. Pattie journal completely. And
6 when you were talking to Mr. Hood, you mentioned that
7 you used a daisy chain method of research? What is a
8 daisy chain method of research?

9 A. What I was referring to was that I am citing
10 information that came that was previously in the Land
11 Department reports. It was in reports by Barbara
12 Tellman. Other reports that discussed, either we had
13 prepared or participated in preparing, and they were
14 pointing at the original source. So my daisy chain, if
15 you will, is from here to those reports to the original
16 sources.

17 Q. And can you turn to the next slide real fast
18 for me? Let's see here. Under Segment 7, the fourth
19 bullet. Who is Turner?

20 A. I don't recall specifically but he was a
21 member of the Kearny Expedition. I don't recall his
22 rank or his position.

23 Q. Did you happen to read the original journal of
24 Henry Turner?

25 A. I did not.

1 Q. Do you happen to know if there were any other
2 people that were in the army of the West that had
3 journals or diaries or memoirs that could have been
4 looked at or used?

5 A. I don't know specifically as I sit here today.

6 Q. So you've never heard of Dr. Charles Griffin?

7 A. I have actually.

8 Q. Oh, you have?

9 A. I think, I think I've cited something he said
10 somewhere along the line.

11 Q. So do you recall whether or not you read his
12 diary?

13 A. I know I did not read his diary, at least not
14 in its entirety.

15 Q. And did you read Emory's reports in their
16 entirety?

17 A. No.

18 Q. Kearny's report is in the record. Did you
19 read that one in its entirety?

20 A. No, I did not.

21 Q. Did you happen to, when you quoted Emory and
22 Turner, did you happen to cross reference the dates of
23 when they made these specific comments?

24 A. The specific dates, no, I -- I don't have that
25 written down here. Again, I'm reporting what was in the

1 Land Department report, and there were others who did
2 the historical research that I'm summarizing and
3 reporting on here.

4 Q. Okay.

5 A. They may or may not have written the entire
6 journals, I don't know.

7 Q. Have you seen the entire journals, or did you
8 just read what was already in the report?

9 A. I would have seen the report and whatever else
10 I've seen that's been disclosed.

11 Q. Okay. Those are the only questions I have.
12 Thank you.

13 MR. SPARKS: Thank you, Mr. Fuller. Thank
14 you, Members of the Commission, Mr. Chairman.

15 THE WITNESS: You're welcome.

16 CHAIRMAN NOBLE: Thank you.

17 Mr. Helm, do you have some questions?

18 MR. HELM: Just a couple.

19 CHAIRMAN NOBLE: While Mr. Helm is moving up
20 and Mr. Sparks is moving out, we'll take a break.

21 MR. SPARKS: Mr. Chairman, I just want to make
22 a satirical comment about that statement. I need to
23 know the logarithm that he used on the conclusion that
24 he had a couple of questions, and that will help me
25 understand how long I can be sleeping.

1 CHAIRMAN NOBLE: Yes, sir, whatever that
2 meant.

3 MR. HELM: It's been as long as I slept since
4 he's been talking.

5 CHAIRMAN NOBLE: He needs a break.

6 (Recessed from the 2:16 p.m. to 2:29 p.m.)

7 CHAIRMAN NOBLE: Go for it.

8 MR. HELM: We'll try and make it quickly.

9

10 CROSS-EXAMINATION

11 BY MR. HELM:

12 Q. Mr. Fuller, you've been an expert witness at a
13 number of these hearings, correct?

14 A. Yes.

15 Q. You've been an expert witness in a number of
16 court cases, correct?

17 A. Yes.

18 Q. So you have a little bit of experience in how
19 witnesses prepare to be an expert in rendering opinion
20 either in court or in one of these types of hearings,
21 correct?

22 A. I do.

23 Q. Is it unusual when you're doing that to rely
24 on other experts' opinions who are recognized in the
25 field to help construct yours?

1 A. I would say no. It's more common than not.

2 Q. And in fact, if you look at the work that's
3 been done by virtually every expert that's going to
4 appear in front of this Commission in the next few days,
5 they all relied on other people, didn't they?

6 A. To some degree, yes.

7 Q. The next question, I believe it was Mr. Sparks
8 talked to you about the River Information Digest. Do
9 you remember that?

10 A. I recall that, yes.

11 Q. Okay. And the publication date on that, at
12 least on the copy that was handed to me is 1985?

13 A. Yes, it is.

14 Q. Okay. Does it state anywhere in here that it
15 was prepared in accordance with the natural and ordinary
16 conditions of the rivers it talked about?

17 A. I did not see that anywhere, no.

18 Q. Okay. Now, he talked specifically about, and
19 I'm sorry, I didn't get the big copy. I got the little
20 copy, so I have to take off my glasses to see the darn
21 thing.

22 He talked to you about kayaks, correct?

23 A. He did.

24 Q. And if you would look under the commercial
25 category down there, at the line where kayak appears,

1 would you read the full line?

2 A. "Small craft, kayak, et cetera."

3 Q. Did he ever define for you what a small craft
4 was?

5 A. No.

6 Q. Okay. Did he ever define for you what
7 et cetera was?

8 A. No.

9 Q. Do you think that maybe the et cetera or the
10 small crafts might have included flat-bottom boats and
11 canoes?

12 A. That sounds reasonable, sure.

13 Q. Either that or in the et cetera category?

14 A. It definitely would fit in as an et cetera.

15 Q. Okay. And canoes, I mean, we're talking about
16 the Interagency Whitewater Committee. They are
17 obviously aware of canoes.

18 A. You would think.

19 Q. Yes, you certainly would. Do they mention it
20 in here anywhere?

21 A. I didn't see the word canoe there, no.

22 Q. I didn't either.

23 Lastly, you've been cross-examined by
24 everybody and their dog about trade and travel up the
25 river, trade and travel down the river, whether trade

1 and travel have to be combined, and whether they've got
2 to be for commerce. Do you recall that over the course
3 the last couple days?

4 A. Yes, I do.

5 Q. Okay. Just to kind of sum it up at least from
6 the picture of the Defenders of Wildlife case, which I
7 believe you were a player in as of about two cases ago?

8 A. I was here then, yes.

9 Q. I've just taken the liberty of underlining
10 three little lines in that case. Would you read those
11 three lines verbatim?

12 MR. SPARKS: You probably brought enough of
13 those for everybody, right?

14 MR. HELM: Pardon me?

15 MR. SPARKS: You probably brought enough of
16 those papers for everybody to look at, right?

17 MR. HELM: No, I didn't. But I thought you
18 would have read it about 14 times. And your questions
19 didn't seem to indicate that you had.

20 MR. SPARKS: I was just thinking about all the
21 other people in the room.

22 CHAIRMAN NOBLE: Gary, are you able to get
23 that interplay on the record?

24 THE REPORTER: Yes.

25 BY MR. HELM:

1 Q. Could you go ahead and read it, please?

2 A. This is from Defenders of Wildlife v. Hull,
3 Page 421, second column, second full paragraph midway
4 down, it says, "The federal test has been interpreted to
5 neither require both trade and travel together nor that
6 the travel or trade be commercial."

7 Q. Thank you. Just so I get a little overkill in
8 there, we'll go over to Page 422, and I took the liberty
9 of underlining another little statement in there. Would
10 you read that one verbatim, please?

11 A. Yes, this is Page 422 of the same report,
12 second column, Item v, Profitable Commercial Enterprise,
13 "As discussed above, nothing in the Daniel Ball Test
14 necessitates that the trade or travel sufficient to
15 support a navigability finding need be from a profitable
16 commercial enterprise."

17 Q. Thank you. I have no further questions.

18 CHAIRMAN NOBLE: Thank you very much.

19 Mr. Katz, are you next?

20 MR. KATZ: I guess so.

21 CHAIRMAN NOBLE: Mr. Fuller, do you think you
22 can withstand this?

23 THE WITNESS: I think I can withstand to the
24 end, thank you.

25 CHAIRMAN NOBLE: Remember, this is your

1 friend, Jon.

2 MR. KATZ: Was that past tense?

3 THE WITNESS: With friends like this --

4

5

REDIRECT EXAMINATION

6 BY MR. KATZ:

7 Q. Mr. Fuller, I'd like to promise you that I
8 won't be too long, and I want to try to make a
9 commitment to the Commission that I won't be too
10 repetitive. But this is our one chance to at least lay
11 the groundwork on this particular river system.

12 Since we started out by asking you about the
13 Defenders of Wildlife case, that was a proceeding that
14 was argued by the Arizona Court of Appeals around 2001,
15 correct?

16 A. Correct.

17 Q. And in that proceeding, if you recall -- and I
18 can give you the case to look at again -- we were
19 operating under a Title 37 statute regarding
20 navigability determinations of Arizona rivers under a
21 system whereby statute the river or rivers in Arizona
22 were presumed to be nonnavigable. Correct?

23 A. Correct.

24 Q. And the statute also provided that the burden
25 of proof was not preponderance of evidence or more

1 likely than not. It was clear and convincing evidence?

2 A. That's my recollection, yes.

3 Q. And the statute also set out criteria that
4 were supposed to be used to determine the navigability
5 of the river which aren't necessarily consistent with
6 the criteria that are set out in the Dan Ball case and
7 that were set out with greater specificity in the case
8 that you just were referred to, the Defenders of
9 Wildlife case, at 341 Arizona Advanced Reporter 3 is the
10 copy that I have. But you might have been looking at
11 another copy. Is that correct?

12 A. Correct.

13 Q. And that's a 2001 decision, correct?

14 A. Yes.

15 Q. I don't recall the exhibit number -- and maybe
16 my colleagues can help me out in that regard -- but you
17 were referred frequently by Mr. Hood and others to this
18 final report "Criteria for Assessing Characteristics of
19 Navigability for Small Courses in Arizona," that was
20 written in September of 1998, correct?

21 A. That's correct.

22 Q. And this sets out numerous criteria for
23 determining the navigability of a river in Arizona based
24 upon the statute, required statute scheme and not based
25 upon the Arizona court's subsequent ruling in the

1 Defenders of Wildlife case, correct?

2 A. That is correct.

3 Q. And the statutory scheme, if you recall, was
4 largely set aside and declared to be in violation of the
5 Arizona Constitution or the United States Constitution,
6 correct?

7 A. That's correct.

8 Q. And again, under the Defenders of Wildlife
9 case, you were asked earlier by Mr. Murphy repetitively,
10 trade and travel, with "and," the conjunctive rather
11 than the disjunctive "or." Defenders of Wildlife that
12 you just read from says it can be trade or travel,
13 correct?

14 A. That's correct.

15 Q. And you were also asked by numerous other
16 lawyers or several other lawyers about commercial
17 viability or profitability. Arizona case, Defenders,
18 that we rely on here today doesn't require that it be
19 for commercial gain or profit, does it?

20 A. No, it does not.

21 Q. And since we're dealing with case law -- and
22 I'm not asking you for legal opinions, and I know that
23 each fact situation is different, one from the other --
24 but the United States versus Utah case was decided in
25 1931 or thereabouts, correct?

1 A. That's my understanding, yes.

2 Q. And a Special Master was hired or appointed by
3 the Court to do a detailed report regarding the
4 navigability of -- was it the Green and Colorado, and
5 portions of the Colorado River?

6 A. And the San Juan.

7 Q. And the San Juan. And in that particular
8 case, the Special Master, as well as the judge that
9 decided the case at the trial court level and the higher
10 courts as well, were required to rely upon the facts
11 that were presented to the Special Master and/or the
12 court, correct?

13 A. Correct.

14 Q. And going back to the Daniel Ball Test and all
15 of the other federal case law that you may have glanced
16 through over the years, each river's navigability is
17 supposed to be determined on its own unique facts,
18 correct?

19 A. Correct.

20 Q. And the case law, Daniel Ball says, that
21 navigability in fact. And that's what we're trying to
22 determine, whether or not at statehood --

23 A. Yes.

24 Q. -- the river was navigable in its ordinary and
25 natural condition, correct?

1 A. Correct.

2 Q. And if it is navigable in fact -- and that's
3 what this Commission needs to determine -- it is
4 navigable in law, correct?

5 A. Correct.

6 Q. And we've spent a very large amount of time in
7 this case talking to you, or at least others have talked
8 to you, about the river history, correct?

9 A. Correct.

10 Q. And sometimes history is better maybe than
11 science, and other times science might be better than
12 history when it comes to determining the unique facts of
13 a particular river or river system?

14 A. Yes.

15 Q. When we deal with a river, it has unique
16 characteristics, correct, and we've been through a lot
17 of those?

18 A. Yes, it does, each river is unique.

19 Q. And you've already told us that when you take
20 a look at the Gila River today, at least Segments 1
21 through 5 we'll take a look right now, in today's
22 condition with substantial upstream damming and
23 diversion, are Segments 1 through 5 of the Gila River
24 today with that major change in ordinary and natural
25 condition navigable perennially?

1 A. Certainly Segments 1 and 2 and 4 and 5.

2 Q. And what about Segment 3?

3 A. Segment 3 is substantially depleted of water
4 most -- a good chunk of the year.

5 Q. And is that as a result of natural conditions?

6 A. No, it is not. Man-made diversion.

7 Q. And if you didn't have the man-made diversion,
8 significant agriculture within that segment, do you
9 believe that if we put that water back in at the time of
10 statehood, that Segment 3 would be navigable?

11 A. Yes, and also add that based on the visits
12 that I've made to the portions of Segment 3, I've not
13 done it myself; but in other projects working along that
14 reach, my observations of the river is that I could put
15 a boat in there. It would be a low water boating
16 situation during significant chunks of the year still in
17 Segment 3.

18 Q. You were asked a number of questions about the
19 Santa Cruz, San Pedro, and San Francisco Rivers,
20 correct?

21 A. Yes.

22 Q. And while you at times may have been more
23 familiar with those river systems than you are here
24 today, you did not focus in on or review all of the
25 data, reports, and evidence that was presented before

1 this Commission on the San Pedro or Santa Cruz Rivers in
2 prior 2005 or thereabouts hearings?

3 A. Meaning preparing for this, did I --

4 Q. Right, in preparing for this.

5 A. Right, I did not.

6 Q. Did you reread the San Pedro and Santa Cruz
7 reports?

8 A. No.

9 Q. And again, when you were hired by the Land
10 Department to revise the reports on all of the river
11 systems here in Arizona in or about 2003, did you start
12 out with any presumption that any particular river was
13 or was not navigable?

14 A. I did not.

15 Q. And did you try to do the best you could to do
16 a factual, historical, and archaeological investigation?

17 A. Yes.

18 Q. And when we look at the flow rate or flow
19 curves that other experts in these proceedings have
20 previously presented to this Commission and are
21 presenting again in their reports that are either in
22 evidence or will be in evidence, you've indicated
23 repetitively that their low flow rates and their median
24 flow rates, their recreations of what the river would
25 have been like in its ordinary and natural condition

1 would make the river navigable in all eight segments
2 perennially; is that correct?

3 A. That is my opinion, correct.

4 Q. And while we can debate -- and others have
5 previously -- as to whether the San Pedro River was
6 navigable at statehood, before it was diverted, which
7 was prior to statehood, correct?

8 A. Right.

9 Q. There was substantial diversions prior to
10 statehood?

11 A. There were.

12 Q. San Pedro contributes today and contributed
13 more to the Gila River prior to statehood than it does
14 now?

15 A. That's correct.

16 Q. San Francisco, the same way?

17 A. Yes.

18 Q. And what about the Santa Cruz River?

19 A. I would say the Santa Cruz is not
20 significantly different in terms of its contribution to
21 the Gila River on the surface.

22 Q. You spent a lot of time discussing the types
23 of boats -- and you don't need to pull it up -- but
24 slide 7 was several types of boats that were available
25 in and near Arizona around 1912, correct?

1 A. Correct.

2 Q. But again, it's your understanding that
3 whether or not these boats were used, the technology was
4 available to both settlers, trappers, traders, and
5 Native Americans, correct?

6 A. Correct.

7 Q. So there are a number of explanations, and
8 we're not going to go through all of those again as to
9 why the river might not have been boated, correct?

10 A. Correct.

11 Q. But you also rely on historical accounts in
12 newspapers as well as in books about the navigability of
13 the river pre-statehood?

14 A. That is correct.

15 Q. And some accounts show successful trips and
16 other accounts show somewhat or even total failure of
17 trips, correct?

18 A. Correct.

19 Q. And when we rely on newspapers, sadly, there
20 are murders that take place, burglaries and robberies
21 that take place everyday in Arizona, and they don't
22 always make the newspaper or certainly aren't on the
23 front page to be reviewed by historians. Would that be
24 a correct statement?

25 A. There are lots of things that happen that

1 don't end up in the newspaper, correct.

2 Q. And when regular and ordinary things take
3 place, sad to say that sometimes even murders or
4 high-profile things that we view as extraordinary take
5 place, when they become the usual or norm, they're often
6 not regularly covered or reported unless somebody makes
7 an effort to call attention to themselves. Would that be
8 a correct observation?

9 A. Dog bites man; man bites dog. One of those is
10 news.

11 Q. And when we talk about 27 years to figure out
12 the Missouri River, that doesn't mean that people
13 couldn't and weren't floating boats down the Missouri
14 River before they got that figured out to find out the
15 best means of transportation down that river, correct?

16 A. That's correct. It's with regard to a
17 specific type of boat use.

18 Q. And Lewis and Clark, I believe, took about 40
19 some folks down the Missouri River, at least to the
20 Great Falls area in a keelboat; and a keelboat has a
21 long portion of that boat that digs deep down into the
22 water, correct?

23 A. That's my understanding, yes.

24 Q. And a keelboat isn't exactly an ideal boat to
25 take down the Missouri River, correct?

1 A. Not that I'm aware of.

2 Q. And you couldn't take a keelboat down the Gila
3 River, could you?

4 A. Not during -- not in portions of it.

5 Q. And you don't know whether or not the Special
6 Master that relied upon the evidence presented to him in
7 the 1931 Utah case was a hydrologist or a boater, do
8 you?

9 A. I do not.

10 Q. And you don't know the extent to which
11 experienced boaters may have presented evidence to him
12 during that hearing?

13 A. I do not.

14 Q. And you're not aware of the extent to which
15 hydrologists might have presented evidence to him
16 either, are you?

17 A. No, I'm not.

18 Q. Now, have the fields of hydrology and
19 geomorphology changed significantly in terms of
20 education and technology since the 1930s?

21 A. Yes.

22 Q. And certain basic principles of flow and
23 dynamics are the same today as they were before?

24 A. Water still goes downhill.

25 Q. But the techniques to investigate, for

1 example, the effects of groundwater or whether it's
2 percolation taking away flow from the river or
3 underground flows back into a river or surface flows
4 into a river, the techniques for measuring those things
5 have greatly improved since the 1930s?

6 A. We have many new tools, and many of them are
7 better.

8 Q. And you would agree that while you have
9 information, historical information that tells us that
10 steamboats were used, as you said for a period of about
11 20 years from about Dome to Yuma or about 20 miles of
12 that river, you couldn't take a steamboat on the upper
13 Gila, correct?

14 A. That's my opinion, yes.

15 Q. But that doesn't make the upper Gila
16 nonnavigable, right?

17 A. It does not.

18 Q. And the upper Gila Segments 1 through 3, as
19 you characterized in these proceedings, is currently
20 navigable?

21 A. Correct.

22 Q. And I think you also said that the median flow
23 rate of the Colorado is similar to the Gila as a whole.
24 Was that a correct statement?

25 A. It would be higher, but similar.

1 Q. And the Colorado River flows were higher at
2 least during certain times of the year or various
3 segments of the Colorado. That doesn't mean that the
4 Colorado River throughout its course is deeper than the
5 Gila River throughout its course in its ordinary and
6 natural condition, does it?

7 A. Not necessarily. But there are certainly
8 parts of the Colorado River that are deeper than parts
9 of the Gila River.

10 Q. And Segments 1 through 3 of the river or the
11 upper Gila do carry more than six inches of water as
12 their median, ordinary and natural flow; is that
13 correct?

14 A. That's correct.

15 Q. And while you might be able to get through a
16 riffle that's two inches deep in a canoe, if the entire
17 depth of the Gila River or a segment of it is only two
18 inches, are you likely to be going down that
19 recreationally, commercially or otherwise?

20 A. Probably not recreationally. And probably not
21 commercially. I would not consider it to be a navigable
22 river at that depth.

23 Q. But two inches is way below the ordinary and
24 natural flow of the Gila River in each and every one of
25 its segments; is that correct?

1 A. Yes.

2 Q. And again, that 1998 criteria report that we
3 referred to that says rubber boats, not real common
4 until the 1940s, that report to a large extent is no
5 longer viable. Would you agree with that, at least from
6 a legal perspective?

7 A. Many of the presumptions that that report
8 addressed have been struck down.

9 Q. But again, one historian might conclude one
10 thing and another historian another, but you are at
11 least aware of one incident in which a pre-statehood
12 rubber boat was floated or likely floated down the Gila
13 River?

14 A. A pre-statehood rubber boat? No.

15 Q. I just wanted to make sure that I didn't
16 misinterpret or misunderstand anything.

17 At Page 60 of your report on boating, you list
18 various populations. Correct?

19 A. Correct.

20 Q. But even if that doesn't reflect the 5,000 or
21 8,000 Native Americans that may have been in Arizona --
22 and I don't remember the precise numbers -- we didn't
23 have large cities where manufacturing was taking place
24 in 1912, correct?

25 A. No, that was slide 61, by the way.

1 Q. Okay. Slide 61. And Arizona, at least when
2 native cultures were living along the river like the
3 Hohokam -- and the Hohokam were largely in the middle
4 Gila area?

5 A. Yes.

6 Q. Which would be Segments 5 and 6?

7 A. Yes.

8 Q. And from everything you've read and you've
9 previously testified, they established agricultural
10 communities along various locations throughout those
11 segments of the Gila, correct?

12 A. It would be Segment 6 would be more accurate.

13 Q. Okay. And the history suggests that they were
14 largely nonnomadic tribes that were living off of their
15 seasonal agriculture, correct?

16 A. Correct.

17 Q. And in order to be able to fill up two hundred
18 miles of canals with water and to have seasonal
19 agriculture, you'd have to have pretty much a perennial
20 flow of water, would you not, within that segment?

21 A. Perennial or flowing in the correct seasons
22 and in significant amounts.

23 Q. And both the Daniel Ball Test, and as it is
24 reiterated in the PPL Montana case -- and again, PPL
25 Montana does confirm that the test for navigability is

1 the Daniel Ball Test, correct?

2 A. Correct.

3 Q. It just says you need to take a look at
4 individual segments of the river, particularly if their
5 hydrology or geomorphology significantly varies from
6 reach to reach or segment to segment?

7 A. Correct.

8 Q. And again, even with about a thousand years or
9 more of sustained agriculture by the Hohokam and
10 successor tribes along that middle section of the Gila,
11 would you consider those diversions at that time to be
12 material or have substantially affected the natural
13 condition of the river?

14 A. I think they would deplete the flow in the
15 river to some degree, but certainly not to the degree
16 that the Anglos did when we got here.

17 Q. And from about 1860 through the present, there
18 has been a continuing depletion of water from those
19 river courses, correct?

20 A. Correct.

21 Q. And also, there has been a depletion of water
22 from the streams and groundwater that might in the
23 natural condition replenish those rivers?

24 A. That's correct.

25 Q. What's your understanding of Daniel Ball as

1 reiterated or reflected in PPL Montana as to whether or
2 not every segment that we're talking about would have to
3 have navigability twelve months a year, year in and year
4 out?

5 A. It's my understanding that they said that it
6 was not required that it be 365 days a year or that
7 every segment of river be navigable.

8 Q. And there might be some segments in Arizona,
9 particularly the lower Gila, that might on occasion in
10 the ordinary and natural condition have gone dry because
11 of a lack of precipitation, correct?

12 A. Lack of flow? Or lack of precipitation?

13 Q. Lack of flow.

14 A. Lack of flow. And I would characterize that
15 would be more likely in Segment 6 than other segments.

16 Q. And why is that?

17 A. It's a losing stream, and by the time you get
18 to the end of Segment 6, it receives a significant boost
19 in flow from the Salt River and its tributaries.

20 Q. And prior to statehood in 1912, one of the
21 reasons that the Roosevelt Dam was constructed was
22 because the water that was available to ranchers and
23 farmers along the Salt River had already been
24 overallocated. There wasn't enough to nourish those
25 crops and livestock.

1 A. The function of the dam was to regulate the
2 flow of water to better meet the needs of the water
3 users.

4 Q. And the result of the damming of the Gila
5 River -- excuse me, the Salt River, that occurred at or
6 before statehood, correct?

7 A. On the Salt River, yes.

8 Q. And since that dam has been constructed, and
9 now three subsequent dams along the Salt River, there is
10 almost no flow except when releases occur because of
11 anticipated floods or the need for agriculture. There's
12 almost no flow down the Salt River at the confluence of
13 the Gila, correct?

14 A. Correct. Well, there's no flow from the upper
15 watershed. The flow is directly down the riverbed to
16 that segment of the river.

17 Q. And there may be effluent that gets down
18 there?

19 A. There's effluent. There's some irrigation
20 return.

21 Q. And that's the other thing, too, is that more
22 likely than not the irrigation returns, when we had
23 Native Americans and early settlers that were diverting
24 water to croplands that were adjacent to the river
25 banks, to the extent that those waters were not absorbed

1 by crops or used by plant growth or evaporated, that
2 water would flow back into the river, correct?

3 A. Yes.

4 Q. But when you set up a diversion dam, and that
5 doesn't allow water to, in its natural way, to flow down
6 the river, you could end up creating a desert-like
7 condition in that river bottom that wouldn't be ordinary
8 or natural?

9 A. I think as a result of the diversions, the
10 existing -- the remaining channels look significantly
11 different than their ordinary and natural condition.

12 Q. And we talked about the Segment 6 portion of
13 the river through the Indian reservation. That when you
14 drive over it on I-10, it looks hardly different, if at
15 all, than the natural desert, correct?

16 A. I would say to the casual observer, yes.

17 Q. But you had Pattie's observations that there
18 were large stands of cottonwood and willows within that
19 segment, correct?

20 A. Pattie and the other folks as well.

21 Q. And also an observation that Native Americans
22 were engaged in fishing?

23 A. Correct, throughout the year, supposedly.

24 Q. Throughout the year, and that there were large
25 fish in the river, correct?

1 A. That is correct.

2 Q. And if you have a desert, you're going to have
3 large fish living in it?

4 A. Generally they prefer water, yes.

5 Q. And you have had a chance to review
6 Mr. Weidman who works at Game and Fish, his declaration?

7 A. I did.

8 Q. And he talks both about fish and the
9 requirements that are necessary in a river system for
10 there to be large, sustainable populations of fish?

11 A. Yes, and I relied on Mr. Weidman's declaration
12 and information that I developed.

13 Q. Do you think it would be helpful to this
14 Commission to take a look at Mr. Weidman's declaration?
15 We're not going to call him, in order to save us at
16 least a little bit of time, but do you think that that's
17 helpful to you and would be helpful to all of us to read
18 and understand it?

19 A. I would certainly encourage the Commission to
20 consider that document. I'm hoping I don't have to sit
21 here and read it out loud.

22 Q. Okay. We're not going to have you do that
23 unless somebody else wants you to. But we do have also
24 information in that Weidman declaration.

25 MR. KATZ: And, Joy, I don't know what number

1 that is, if you know, but it's probably X020, and then a
2 tab, and we'll get that in the record momentarily.

3 BY MR. KATZ:

4 Q. But he also talked about beaver, correct?

5 A. He does.

6 Q. And he largely concludes that in the Gila
7 River system we would largely be dealing with
8 bank-dwelling rather than dam-dwelling beaver, correct?

9 A. Yes. His observations as a Game and Fish
10 specialist are very similar to Mr. Farmer's and my own
11 observations of the river, not seeing beaver dams, but
12 seeing bank-dwelling beaver.

13 Q. And there are beaver signs and beaver that
14 you've seen on your various trips down the Gila?

15 A. Absolutely.

16 Q. And again, you've never hit a beaver dam
17 that's been an obstacle to your navigation?

18 A. I've never hit a beaver dam on the Gila.

19 Q. And while you could build a dugout canoe out
20 of cottonwood trees, is that the ideal material for the
21 construction of dugout or any other type of wood canoe?

22 A. I would say a dugout canoe is not the ideal
23 construction. You could build one out of a cottonwood;
24 you could build it out of other trees as well.
25 Cottonwood is obviously a relatively soft wood.

1 Q. There was a big deal made when Mr. Hood
2 cross-examined you that you weren't aware of ore or
3 other -- well, supplies going into the mines by way of
4 boat or quantities of ore coming off the river.

5 Would it be practical, even if the -- I mean,
6 assuming that they're even larger than in ordinary and
7 natural -- well, let me rephrase that.

8 Taking a look at ordinary and natural flow
9 down the river, could you get a large barge or a
10 steamboat or some other bigger than a small craft type
11 of boat down there to transport tons of ore even if the
12 river were in its ordinary and natural condition?

13 A. Not reliably.

14 Q. And does that mean that you couldn't do other
15 things, such as deliver mail or goods between
16 communities if there were sufficient population and
17 need?

18 A. No, my opinion is that anything you could do
19 in a small low draft boat, you could do on the Gila
20 River in its ordinary and natural condition.

21 Q. And the Daniel Ball Test, as reiterated in
22 Defenders, and the Utah case before that, and in PPL
23 Montana, doesn't require that there be boating both
24 upstream and downstream, correct?

25 A. That's correct.

1 Q. And as you indicated, there are sometimes
2 better means for the transportation of large loads,
3 particularly in open country, in wagons or later on by
4 trucks or cars, correct?

5 A. Or trains, true.

6 Q. And by the 1870s to early 1880s as the
7 population started to boom and the diversions continued
8 to increase, there was significant reliance on railroads
9 that could take you all the way from here to California?

10 A. Indeed.

11 Q. And also from here to the Baja Peninsula if
12 you wanted to put something on a large ocean-going boat
13 or vessel. In other words, was there a railroad that
14 you could take?

15 A. I don't know out to Baja, Mexico.

16 Q. Okay.

17 A. But certainly to California and ports there
18 for sure.

19 Q. Okay. Now, again, if you boat down a river,
20 whether it's for recreational purposes, be it for
21 commercial purposes or not, or you're boating to deliver
22 mail or goods, lumber, whatever the case might be, do
23 you usually secure that load?

24 A. Yes, you do.

25 Q. And if it's susceptible to being destroyed by

1 water in the event of a capsize or tipover, even if it's
2 secured, were there means at the time of statehood to
3 prevent that load from getting wet, even if not as
4 sophisticated or technologically advanced as today?

5 A. Yes, there were.

6 Q. And again, I asked this a number of different
7 ways. But the Gila River today, at least Segments 1, 2,
8 4, and 5 with the diminished flows are, in fact,
9 navigable in fact?

10 A. Oh, yes.

11 Q. And if you added the water back into them at
12 the time of statehood, we would have navigability in
13 fact, correct?

14 A. Still would, yes.

15 Q. You were questioned to a large extent about
16 whether or not you had read Pattie's original diaries or
17 journals, correct?

18 A. That's correct.

19 Q. And you then talked, I think, about the daisy
20 chain. But we have a couple of books, including a Brown
21 book or study, and other pieces of evidence that were
22 admitted in the 2005 hearing that have quotations from
23 Pattie, correct?

24 A. That's correct.

25 Q. And those quotations that are in your revised

1 report of 2003 or that you testified to previously and
2 at Page 21, I think, of the Davis thesis, Pattie wasn't
3 just dealing with the upper Gila, correct?

4 A. That's correct.

5 Q. And you are convinced that there are multiple
6 resources or sources of information before this
7 Commission that tell us that Pattie took several trips
8 between Safford and Yuma in the 1820s, correct?

9 A. Some historians have reported that that was
10 his testimony.

11 Q. And you were asked about the Gila River above
12 the San Francisco in the valley that existed there.
13 You, I believe, testified that by 1901 most of the Gila
14 River Valley had been diverted for agricultural
15 purposes; is that correct?

16 A. I'm not sure I testified that -- you're
17 talking about the Duncan Valley that most of the water
18 had --

19 Q. That might be. But I'm talking the river
20 above the confluence with the San Francisco?

21 A. Yeah, that would be the lower part of
22 Segment -- the upper part of Segment 2 and all of
23 Segment 1, and there were significant diversions in
24 there that particularly lowered the low flows.

25 Q. And as I'm going through my notes, I'm

1 skipping over a lot of these slides that we could go
2 through a second time. I don't want to do that.

3 And again, at the original or the 2003
4 testimony by Ms. Tellman and her portion of the revised
5 report, she reports that Pattie canoed that several
6 times from Safford to Yuma, and she cites Davis's
7 master's thesis, correct?

8 A. That's correct.

9 Q. And take a look at slide 152 of your Gila
10 report, if you would. Your report uses median flows,
11 correct?

12 A. That's correct.

13 Q. But Mr. Burtell, is it, that he was using mean
14 flows?

15 A. No, he was reporting median flows.

16 Q. And if you used a mean flow, that would be
17 exaggerated either up or down based upon whether you had
18 long periods of drought or flood, correct?

19 A. Typically in Arizona the mean is higher than
20 the median.

21 Q. And that's -- go ahead.

22 A. I just recall that there were some errors on
23 this slide that were pointed out earlier.

24 Q. Oh, on 152. Joy reminded me, and my notes are
25 reminding me now, that you put -- that there were a

1 couple of errors in that slide. What are the errors,
2 and does it make any difference with respect to your
3 ultimate conclusion?

4 A. Apparently on a few, a number of these I
5 copied down the velocity rather than the depth. In
6 those cases the numbers that I reported are slightly
7 higher than the numbers that Mr. Burtell actually
8 reported, but they're still higher than the threshold of
9 boating that we're using.

10 Q. Will they show median flows throughout most of
11 the Gila above six inches?

12 A. Well, this slide right here is not so much
13 about the median flow, but is the depth --

14 Q. Okay.

15 A. -- relating to those median flows.

16 Q. And the depth is more than six inches?

17 A. Yes.

18 Q. Even if you corrected Mr. Burtell's numbers,
19 would the depths average or median depths be greater
20 than six inches?

21 A. Yeah, and that's for the lowest flow month
22 that he reported.

23 Q. And were they generally more than -- they were
24 somewhere between a half a foot and a foot at the lowest
25 levels?

1 A. Yeah, the lowest was a half foot, as I recall.
2 No doubt, we'll hear more on that.

3 MR. KATZ: I'm going to have Joy ask a couple
4 questions she wrote down rather than my having to read
5 her writing, and then I'll get back to my --

6 MS. HERNBRODE: I do resent the implication in
7 the record that I have bad handwriting, but we'll move
8 on from that.

9

10 REDIRECT EXAMINATION

11 BY MS. HERNBRODE:

12 Q. Jon, do you carry a GPS, cell phone, first-aid
13 kit or similar devices when you run a river?

14 A. Sometimes, but not always.

15 Q. Are those devices absolutely necessary?

16 A. Besides GPS, the first-aid kit caught my ear.
17 And I don't remember the rest.

18 Q. Cell phone? Repair kit?

19 A. The only reason I bring a cell phone is
20 because I don't want to leave it in the car.

21 Q. You take them because it's prudent to take
22 advantage of modern technology, not because you can't
23 boat without them?

24 A. Yeah, it's pretty nice. I put on my seat belt
25 now, but I could drive a car without it. It doesn't

1 affect the drivability of the roads that I'm on.

2 Q. Same for helmets?

3 A. Oh, yeah.

4 Q. Can you use a river if you don't have USGS
5 gage data?

6 A. Oh, absolutely.

7 Q. So you don't have to -- you can plan a trip
8 even though the USGS gage data doesn't tell you, for
9 example, what the river level is going to be this
10 August?

11 A. Yeah, if you're familiar with the river, you
12 can go out there and you boat it. Sometimes it's nice
13 to know what you can expect, but it's not a criterion.

14 Q. It's prudent to take advantage of modern
15 technology, but not necessary?

16 A. Sure.

17 Q. All right. Mr. Hood asked you about the
18 sources for at least one of your Pattie slides, and you
19 didn't quite have an answer for that.

20 Is the source of that slide Barbara Tellman's
21 Arizona's Changing Rivers at 98, which is Exhibit 001,
22 Part 18, and Doug Brown's Man and Wildlife at Page 19
23 through 20, which is Exhibit X004, Part 3?

24 A. I believe so.

25 Q. And is Brown's Man and Wildlife different than

1 Goode's thesis?

2 A. I believe, yes, it is, different document.

3 Q. Okay. And I just -- Mr. Katz wanted the Small
4 and Minor Watercourses exhibit, and that is Exhibit
5 No. 1, Part 23, and Mr. Weidman's declaration is Exhibit
6 X012, Part 73.

7

8 FURTHER REDIRECT EXAMINATION

9 BY MR. KATZ:

10 Q. Now that I've re-collected myself, a few
11 questions that were written down by me and my colleagues
12 rather than in my notepad, but the presence of ferries
13 during a period of, significant period of years prior to
14 statehood, would demonstrate at least at that time that
15 the river was susceptible to being navigated by boats, a
16 portion of the river was subject to being navigated by
17 boats larger than a canoe?

18 A. Yeah. Yes.

19 Q. But traders and trappers regularly used,
20 throughout the western United States, canoes for trading
21 and trapping, correct?

22 A. That's correct.

23 Q. And they did so in the midwest as well. Fur
24 trade was centered or based in St. Louis, correct?

25 A. Yes.

1 Q. But a lot of that beaver was harvested from
2 the western and southwestern United States?

3 A. Rocky Mountain states, yeah.

4 Q. Would you recommend that a novice boater boat
5 the Colorado River through the Grand Canyon?

6 A. Depends on how well I liked them.

7 Q. But during normal portions of that river that
8 are pretty treacherous during normal flow, correct?

9 A. Yeah, I would say novice boaters, unless
10 they're really quick learners, that's not the place for
11 them.

12 Q. But just because some farmer, rancher or an
13 idiot like me gets into a boat on a river that I've
14 never seen before and maybe puts myself at risk or in
15 danger doesn't make the river nonnavigable, correct?

16 A. That's correct.

17 Q. And even though a novice like me shouldn't go
18 down the Colorado alone, and maybe even with you, I
19 wouldn't have any trouble determining that the Colorado
20 was navigable, because it's already been done for me,
21 correct?

22 A. It's been done.

23 Q. And again, with respect to Segment 4, and
24 that's the segment that goes up to the Coolidge Dam,
25 correct?

1 A. Or down from it, yes.

2 Q. Or is it the one that goes --

3 A. It's below.

4 Q. It's below.

5 A. Yeah.

6 Q. And there are substantial agricultural
7 diversions that occur above the dam?

8 A. Yes.

9 Q. In Segment 3, we've already discussed that?

10 A. Yes.

11 Q. And that would cause the flows down Segment 3
12 to be lower than natural and ordinary, correct?

13 A. Yeah. Again, we spent some time there that
14 there's a change in the seasonality of flow in Segment 4
15 due to the operation of the dam. Overall, I want to say
16 the flows are lower than what they would have been in
17 the ordinary and natural condition.

18 Q. And when we talk about dams stabilizing the
19 river conditions, we're talking about stabilization or
20 predictability for agricultural purposes, not for
21 navigability purposes, correct?

22 A. They're not operating the dam for
23 navigability, no, if that's what you're asking.

24 Q. And when there were reports of erratic flows
25 down the river, that might be erratic in terms of the

1 predictability of water availability for agriculture but
2 not necessarily predictability of water for navigation,
3 title navigation purposes?

4 A. The river in its normal condition under normal
5 parameters is navigable downstream there.

6 Q. Have you encountered any boulders in the -- in
7 your experiences down the Gila River that affect the
8 river's navigability?

9 A. I've encountered many boulders but none that
10 affected navigability.

11 Q. Have you destroyed any boats or capsized
12 because of the presence of those boulders?

13 A. No.

14 Q. And are they usually fairly easy to observe,
15 either by looking at the water flows or the river
16 channel itself?

17 A. I think even the most novice boater can see
18 the boulder coming, whether he can do anything about it
19 is the skill level.

20 Q. And again, there's a difference between flying
21 a fighter plane and a Cessna 180?

22 A. Yes, there is.

23 Q. And there's a difference between driving your
24 car to and from work and driving a multi-ton semi
25 tractor-trailer, correct?

1 A. Yes.

2 Q. Have you ever run into on the Gila River --
3 you've described compound channels -- any meandering or
4 braiding that's been an obstacle or, as you put it, an
5 obstruction to your ability to navigate that segment of
6 the river?

7 A. I have not.

8 Q. And even if there isn't a reliable history of
9 trade and travel on the Gila River prior to February 14
10 of 1912, does that change your opinion as to whether or
11 not the river at earlier dates prior to then was
12 navigable in its ordinary and natural condition?

13 A. Just to be sure I caught the question, did you
14 say if there was not a history, any historical accounts?

15 Q. In other words, even without having the
16 history in front of you, from the gage data that you
17 reviewed, from the gage data that other hydrologists in
18 this case have reviewed and analyzed, and from your
19 perspective, was this river navigable in its ordinary
20 and natural condition even if you didn't have historical
21 events to confirm it?

22 A. Well, there were historical events. I did
23 include those. But had there not been, I think based on
24 the scientific and hydrologic and geomorphic data, my
25 conclusion would be -- and my own personal experience

1 boating as kind of a ground truth to all of that
2 science -- yes, the river is navigable.

3 Q. And there have been some that have suggested
4 if a segment of the river is flooded for months on end,
5 is that an ordinary condition?

6 A. If it's flooded for months on end?

7 Q. Yes.

8 A. I think that's kind of opposite of the
9 definition of flood. But I would call that high flow
10 condition. So I'm not liking the question, to tell you
11 the truth.

12 Q. Okay. Well, we had reports of flooding in the
13 1890s and around 1905 that changed the characteristics
14 at least of the floodplain, correct, along the -- would
15 it be within the entire river or largely downstream?

16 A. The flood occurred on the entire river --

17 Q. Okay.

18 A. -- and as a result of those floods there were
19 segments that experienced changes to the floodplain.

20 Q. And did those segments experience any
21 significant changes to their flow channel?

22 A. To the low flow boatable channel?

23 Q. Yes.

24 A. None that I'm aware of.

25 Q. And from time to time, whether it's the

1 Colorado River, the Gila River or the Salt River, the
2 central or low flow channel because of naturally
3 occurring floods and droughts may change its position,
4 correct, within the banks of the river?

5 A. Yes.

6 Q. But that doesn't mean that it doesn't remain
7 navigable throughout most of the year post those
8 conditions, correct?

9 A. All rivers change to some degree all the time.

10 Q. And if a segment of the river were dry for
11 some of the summer months, for a month or two, on
12 occasion or even regularly, would that make that segment
13 nonnavigable according to PPL Montana or Daniel Ball?

14 A. Not if that's the only fact; all other things
15 being equal, no, that would not.

16 Q. And again, in today's condition, the Gila
17 River, the Segment 6, 7, and 8 are not only losing water
18 from the Salt, they're losing flow from the Verde which
19 has also been dammed at two locations?

20 A. The Verde water comes in through the Salt,
21 yes.

22 Q. And you were asked if you had done an
23 evapotranspiration study. Would that make any
24 difference to you with respect to your ultimate
25 conclusions in this case?

1 A. It doesn't make any difference to my opinions,
2 no.

3 Q. And let me just take another look at my notes.

4 I think that I have one final question. I can
5 beat the dead horse further but I don't want to get
6 anybody upset anymore than they already might be.

7 But again, do you believe that on February
8 14th of 1912, that the Gila River along its entirety was
9 susceptible to being used in its ordinary and natural
10 condition as a highway for commerce over which trade or
11 travel were or could have been conducted in the
12 customary modes of trade and travel on water?

13 A. Yes.

14 Q. And again, when we talk about customary modes
15 of trade and travel, that's the type of boats that were
16 available at the time, correct?

17 A. Correct.

18 Q. And there's nothing in there -- and we were
19 talking about it being used as a highway of commerce.
20 The case law says there's no requirement that the trade
21 and travel be for commercial gain, at least in Arizona,
22 correct?

23 A. Correct.

24 MR. KATZ: I'm done.

25 THE WITNESS: That one question had four

1 parts, just for the record.

2 MR. KATZ: Okay. Do you want to answer it
3 four times?

4 THE WITNESS: No.

5 CHAIRMAN NOBLE: Mr. Katz, do you have any
6 other evidence or witnesses that you intend to present?

7 MR. KATZ: We will confirm with the Commission
8 and with George that all of the exhibits that we have
9 tendered to the Commission have been properly received
10 and identified. But at this time, we don't intend to
11 present any other witnesses for our case in chief and
12 would rest that case subject to confirming the exhibits
13 have been received.

14 CHAIRMAN NOBLE: Mr. Fuller, we appreciate
15 your time and your effort. We ask you to sit down
16 because now it's our turn.

17 THE WITNESS: Oh. Do you want me to turn the
18 presentation back on?

19 CHAIRMAN NOBLE: Yes.

20 THE WITNESS: Sorry about that.

21 CHAIRMAN NOBLE: Mr. Allen.

22

23 EXAMINATION

24 BY COMMISSIONER ALLEN:

25 Q. When the question was asked by Mark regarding

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1 the conditions of the San Pedro immediately adjacent to
2 its confluence with the Gila, you made the comment that
3 you didn't think that the navigability question was
4 pertinent or were you implying that there may have been
5 some navigability potential up the San Pedro where its
6 confluence with the Gila occurs, or not? Because that
7 applies to the Agua Fria and to a number of other rivers
8 such as the San Francisco.

9 A. It wasn't my intent to make any implication
10 about the navigability of the San Pedro River at all by
11 that answer.

12 In all likelihood, the backwater from the Gila
13 River in its ordinary and natural condition probably
14 would extend some distance up the San Pedro River.
15 However, my guess, not having studied this in detail, my
16 guess is it would be within the floodplain limits of the
17 Gila River. Not a significant distance at all. But
18 again, that's my guess having not studied it.

19 Q. Okay. The distance up the Gila River from its
20 confluence with the Colorado, you've indicated is some
21 20 miles or possibly up to Dome?

22 A. The Segment 8 distance?

23 Q. Yes.

24 A. Yes.

25 MS. HERNBRODE: I'm sorry, Commissioner Allen,

1 could you use your microphone, because even I'm having a
2 little trouble hearing you.

3 CHAIRMAN NOBLE: It won't do any good.

4 MS. HERNBRODE: Oh, okay. Never mind then. I
5 apologize.

6 MR. KATZ: That's just for recording.

7 BY COMMISSIONER ALLEN:

8 Q. The location at Dome where there is apparently
9 flow substantial so that a steamboat could float, could
10 move back and forth in that area, is that not controlled
11 basically by bedrock structures that bring the Gila
12 River to the surface at that particular point?

13 A. I think I was asked this question yesterday.
14 It's all running together here. I recall having that
15 question, and I recall my answer as being I don't know
16 specifically. I did not study whether the bedrock is
17 bringing flow up to the surface at that point. There is
18 a bedrock range that the river goes through so it's
19 certainly possible there.

20 Q. Okay. In Tom Murphy's questions, there was
21 some implication that the State might not actually own
22 the bottom of the bed of a navigable river where a
23 reservation was concerned or where the Feds had
24 withdrawn land. Your feeling about that?

25 A. I've heard that argument. Advanced for the

1 Salt River. And it seems to me to be more of a legal
2 question than a technical question. So I'm not going to
3 offer any expertise on that.

4 Q. Well, the problem is that we just heard
5 Mr. Katz say that -- and I would like to quote
6 specifically what he said -- something about
7 navigability in fact does imply navigability as a result
8 of law. That's not exactly what you said, but that's
9 close.

10 How do you resolve the question of the surveys
11 that will be presented subsequently and have been
12 submitted as evidence in regard to the question again
13 that I asked about the ownership of the bed of the
14 channel in a reservation or where land have been
15 withdrawn?

16 A. I guess, Mr. Commissioner, I would say -- I
17 would approach it this way. What I've been tasked to do
18 was determine navigability. What are the flow
19 conditions, can it take a boat, can you take a boat down
20 there, what kind of a boat, what season of the year,
21 what would be the nature of usage for boats; and based
22 on those studies, I'd say yeah, you could take a boat
23 through, regularly through the reservation areas.

24 If that decision is -- if the Commission
25 concurs with that, then the next step is to figure out,

1 okay, what boundaries does the State actually own and
2 whatnot. So I think that's following on after.

3 So I don't know that it affects the
4 navigability in fact part of it. But you're right, it
5 may have implications for the navigability in law as to
6 whether it was the federal government's to give away to
7 the State on February 14, 1912.

8 Q. You made one other comment about the median
9 flow of the Colorado River and the Gila being similar.

10 A. Yeah, similar.

11 Q. How similar is similar?

12 A. That depends on where you are on the Gila.
13 Clearly the median flow rates in the upper Gila are much
14 less than they are near the mouth. Near the mouth, the
15 Colorado River -- the Gila River is likely to have a
16 lower median flow rate than the Colorado River.

17 It's hard to find data on the Colorado River
18 that pre-dates Hoover Dam. So understanding exactly
19 what the ordinary and natural median flow of the
20 Colorado River is more of an inquiry than I wanted to
21 do. It would be lower.

22 Q. Okay. There was also some testimony given
23 about Pattie in 1825, and a comment was made about there
24 being plenty of beaver. That was the quote. And my
25 question is, was he talking about the San Pedro or was

1 he talking about the Gila at this particular point in
2 time? Because the other comment that was made was that
3 there was -- they had real problems. They ate the dogs
4 and the horses or whatever they could get their hands on
5 when they were on the Gila but not necessarily on the
6 San Pedro. So I'm a little confused about where he was
7 referring to with regard to beaver.

8 A. I know that he did trap on the beaver -- he
9 said he trapped on the Gila. That specific comment I'm
10 not exactly sure where he's referring to. I can point
11 you to my own observations. There are plenty of beaver
12 still on the Gila.

13 COMMISSIONER ALLEN: I think that's all I
14 have, Mr. Chairman.

15 CHAIRMAN NOBLE: Mr. Horton, do you have any
16 questions?

17 COMMISSIONER HORTON: No, I don't,
18 Mr. Chairman.

19 CHAIRMAN NOBLE: I have one. Does anybody
20 know where Henness went?

21 COMMISSIONER HORTON: He had to be excused.

22 CHAIRMAN NOBLE: Okay.

23 Thank you, Jon, very much. We appreciate it.

24 Do you have -- you're sitting there for a
25 reason or --