

BEFORE THE ARIZONA NAVIGABLE STREAM

ADJUDICATION COMMISSION

In re: Determination of)
Navigability of the Upper Salt) No. 04-008-NAV
River, Small and Minor) No. 04-010-NAV
Watercourses in Gila County,) No. 05-014-NAV
Small and Minor Watercourses in) No. 03-007-NAV
Maricopa County, the Gila River,) No. 04-009-NAV
and the Verde River.)
)

MEETING OF THE

ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

Phoenix, Arizona

November 16, 2005

(Original)

Prepared by:
Gerard T. Coash, RPR, RMR
Certified Reporter
Certification No. 50503

1 MEETING OF THE ARIZONA NAVIGABLE STREAM ADJUDICATION
2 COMMISSION was taken on November 16, 2005, commencing at
3 9:33 a.m., at the La Quinta Inn, 2510 West Greenway Road,
4 Phoenix, Arizona, before Gerard T. Coash, a Certified
5 Reporter in the State of Arizona.

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16 From the Arizona Navigable Stream Adjudication
17 Commission:

18 Mr. George Mehnert, Executive Director
19 Mr. Earl Eisenhower, Chairman
20 Ms. Dolly Echeverria, Vice-Chair
21 Mr. Jay Brashear, Member
22 Mr. James Henness, Member
23 Mr. Cecil Miller, Member

24 Also Present:

25 Mr. Jonathan E. Fuller, PE, RG, PH, MS, CFM
Mr. Dennis Gilpin, RPA
Mr. David Weedman
Dr. Gary Huckleberry
Mr. T. Allen J. Gookin
Dr. Doug Littlefield
Dr. Stanley Schumm
Ms. Barbara Tellman
Mr. Jerrold E. Knight
Dr. Jack L. August
Mr. Donald C. Jackson

1 TRANSCRIPT OF PROCEEDINGS

2 CHAIRMAN EISENHOWER: Ladies and gentlemen,
3 the time has come to call the meeting of the Arizona
4 Navigable Streams Adjudication Commission to order.

5 Mr. Mehnert, would you call role please?

6 EXECUTIVE DIRECTOR MEHNERT: Commissioner
7 Miller?

8 COMMISSIONER MILLER: Present.

9 EXECUTIVE DIRECTOR MEHNERT: Commissioner
10 Echeverria?

11 COMMISSIONER ECHEVERRIA: Here.

12 EXECUTIVE DIRECTOR MEHNERT: Commissioner
13 Hennes?

14 COMMISSIONER HENNESS: Present.

15 EXECUTIVE DIRECTOR MEHNERT: Commissioner
16 Brashear?

17 Chairman Eisenhower?

18 CHAIRMAN EISENHOWER: Here.

19 EXECUTIVE DIRECTOR MEHNERT: Mr. Chairman,
20 we have four present and one absent. We have a quorum.
21 Although, I do believe that Mr. Brashear is on his way, as
22 is our attorney.

23 CHAIRMAN EISENHOWER: The first order of
24 business for us would be to approve the minutes of the
25 last meeting. Are there any corrections from any of the

1 commissioners to the minutes?

2 COMMISSIONER ECHEVERRIA: Move to approve.

3 COMMISSIONER HENNESS: Second.

4 CHAIRMAN EISENHOWER: There's been a motion
5 and a second approving the minutes from our meeting in
6 October. Are there any comments on those minutes? If
7 not, I call for a vote. All in favor of approving the
8 minutes say aye.

9 COMMISSIONER ECHEVERRIA: Aye.

10 COMMISSIONER HENNESS: Aye.

11 COMMISSIONER MILLER: Aye.

12 CHAIRMAN EISENHOWER: Opposed?

13 Hearing none, the minutes are approved.

14 The next item of business -- a little bit of
15 housekeeping -- I would like to address to the members of
16 the audience -- I would ask that you turn off all of your
17 cell phones and pagers so that it doesn't interrupt the
18 speakers when they're up here.

19 When you want to speak before the
20 commission, please come to the podium, give your name and
21 who you represent, and give any copies of written
22 material -- one copy to the court reporter so that he has
23 it. There will be some other little things that -- like
24 that that occur, so just as a matter of courtesy to your
25 fellow attendees, please keep things to a minimum and we

1 will try to expedite our hearing as rapidly as possible.
2 We have a lot of people who have expressed an interest in
3 testifying and so we will take a little pause here while
4 our member and counsel get somewhat situated.

5 (An off-the-record discussion ensued.)

6 (Commissioner Brashear and Curtis Jennings
7 entered the room.)

8 CHAIRMAN EISENHOWER: Another little
9 housekeeping, we will take a break about noon, because
10 last time we kind of ran on through. So we will have a
11 little lunch break and we'll settle on how long it will be
12 as we get there -- get down to that point. But it gives
13 our poor court reporter a little break for his fingers
14 too, so we'll get that taken care of in due time.

15 EXECUTIVE DIRECTOR MEHNERT: Mr. Chairman,
16 do you want to reflect that Mr. Brashear came in?

17 CHAIRMAN EISENHOWER: Yes. We have all five
18 members present.

19 Okay. Everyone situated and all the members
20 are present now. And our first item on the agenda is an
21 issue that has arisen about whether we have the
22 jurisdiction to adjudicate Roosevelt Lake, and at this
23 time, I would listen to the arguments both for and against
24 that proposition.

25 MR. MCGINNIS: Mark McGinnis on behalf of

1 Salt River Project. We did file a motion -- it's been a
2 couple months ago now. I know you've got a full agenda
3 today. We argued this some last time. And we also filed,
4 pursuant to your petition, a reply. So I think the only
5 thing I would say is that our motion asked for two things:
6 One, that you didn't have jurisdiction to determine
7 navigability of the lake itself; and also with respect to
8 the former rivers that run underneath the lake. Nobody
9 responded and said anything about the jurisdiction of the
10 lake, the big part of the lake. The only dispute we have,
11 the land department said, "No, you have to go ahead and
12 adjudicate the navigability of the river, the old river
13 beneath the lake." We have said pretty much everything I
14 know to say about that, both in our motion and reply and
15 last time, so unless you have questions, I won't take up a
16 bunch of your time on this issue.

17 CHAIRMAN EISENHOWER: I would ask, does
18 anybody have any questions on that issue?

19 COMMISSIONER BRASHEAR: Sometimes I feel
20 like it's time to tell Toto, "We're not in Kansas
21 anymore." Whenever we adjudicated the Lower Salt River is
22 nobody brought up the fact that this was a -- or they did
23 bring it up -- it was a man-made watercourse. But nobody
24 said, "You can't adjudicate it because the water was all
25 sucked out of it and it was man-made and the way it was on

1 the day of statehood, and so therefore it is beyond your
2 jurisdiction." Now we go right up a hundred feet upstream
3 in the same river and we're told, "Oh, no, there's not a
4 lake." It's now everything different. The dam is still
5 there that was there in 1912. We know we adjudicated the
6 Lower Salt, but now it's got water behind it and so
7 therefore we can't touch it now. Why is it that the Salt
8 River -- as it comes down, the dam is there, but why is it
9 the water control regulatory mechanism expands the banks
10 of the Salt and it is navigable up to the high water mark
11 if it is navigable in other places of the river? And how
12 do we manage to come to this thing where we have got two
13 entirely different rivers and two entirely different rules
14 to apply to them?

15 MR. MCGINNIS: Well, Commissioner Brashear,
16 I think the short answer is we're not in Kansas anymore,
17 and we're stuck with the statute. The definitions in the
18 statute, none of them exclude anything in the Lower Salt
19 River. We're just trying to do what your statute says
20 you're supposed to do. The Lower Salt River is the
21 watercourse and clearly the Lower Salt River below Granite
22 Reef. The Upper Salt River has a dam on it. The dam is
23 part of a municipal and irrigation -- it's called man-made
24 water conveyance. That's the way the legislature drew the
25 statute, and I think we're stuck with it. I understand

1 the problems you're having with that, but you're stuck
2 with what the statute says. And I don't think it's
3 inconsistent necessarily, but what the statute says is, if
4 it's a man-made water conveyance system, it's not part of
5 a watercourse.

6 This -- the -- Roosevelt is different than
7 all the other SRP lakes because it was prestatehood. The
8 other SRP lakes -- I think everybody agrees -- are clearly
9 out of what you're doing because they weren't there on
10 February 14th, 1912. Roosevelt was. But the statute
11 says, if it's a man-made water conveyance system, even if
12 it was there on February 14, 1912, it's not under your
13 jurisdiction. I don't know how else to explain it to you
14 other than that's what the statute says.

15 COMMISSIONER BRASHEAR: We could essentially
16 find that the Salt River is navigable but it will be
17 navigable at the bottom of a 600-foot lake that isn't
18 there. By statute.

19 MR. MCGINNIS: I think the answer to your
20 question is no. I mean, our position is -- you've
21 determined already that the Salt River below Granite Reef
22 Dam is not navigable.

23 COMMISSIONER BRASHEAR: Yeah.

24 MR. MCGINNIS: The lake itself, we don't
25 think you need -- can or need to make any determination at

1 all. The river below the lake, we also think you don't
2 need to or can -- can and can't make any determination
3 about that. You still, I think, should make a
4 determination about the rest of river that is not covered
5 by Roosevelt Lake, including the river that is under what
6 is now Saguaro, Apache, and Canyon.

7 But the way the statute -- it's right there
8 in 37-1101-11 -- says, "Watercourse does not include a
9 man-made water conveyance system described in paragraph 4
10 of this section, except to the extent that the system
11 encompasses lands that were part of a natural watercourse
12 as of February 14, 1912." So if Roosevelt is a man-made
13 water conveyance system -- which nobody's disputed at this
14 point -- it does not include lands that were part of the
15 natural watercourse on February 14th, 1912. That river
16 under the -- the old river under the lake didn't exist on
17 February 14th, 1912. It was part of the man-made water
18 conveyance system. And I'm not sure I'm getting to where
19 your question is; we're just trying to construe the
20 statute as best we can.

21 COMMISSIONER BRASHEAR: Let me ask one other
22 question, is there any significance in what the commission
23 does? I think that there is a good chance that the Upper
24 Salt, at least, is probably going to go into court, if not
25 the whole river, and would it elaborate or complicate

1 things which way we went on the Roosevelt Lake? Would it
2 be better if we did say, "Okay, we're going to take the
3 jurisdiction even though --" Or would it be better for us
4 to say, "Well, we won't do it"?

5 MR. MCGINNIS: My reading of the statute is
6 that if you make a determination about Roosevelt Lake, it
7 basically means nothing because you don't have
8 jurisdiction. I guess I would be concerned if I was
9 representing the commission or on behalf of the commission
10 about the commission going into areas that the statute
11 says you're not supposed to go into.

12 In the end, it probably doesn't mean
13 anything if you do determine Roosevelt -- the river is
14 under Roosevelt because it's pretty clear, I think, the
15 statute says you don't have jurisdiction over it. So I'm
16 not giving you advice about whether you should do it or
17 not. I think you can't do it.

18 COMMISSIONER BRASHEAR: Okay. Thank you.

19 MR. MCGINNIS: If there are no other
20 questions, that's all I have.

21 COMMISSIONER ECHEVERRIA: The statutes may
22 govern our actions, but they're not our statutes.

23 MR. MCGINNIS: I understand. You're subject
24 to what the legislature said, and we're just trying our
25 best to tell you what we think the legislature said. I

1 know you didn't draft them.

2 COMMISSIONER ECHEVERRIA: Thank you.

3 CHAIRMAN EISENHOWER: Mr. Jennings, you have
4 a question?

5 COMMISSION COUNSEL JENNINGS: I've been
6 looking while the discussion has been going on, but it
7 seems to me that I read in your brief somewhere that the
8 Salt River Project maintained that the federal government
9 actually withdrew and owns all of the land under Roosevelt
10 Lake. But I can't find it in your brief. Was that -- am
11 I correct or am I --

12 MR. MCGINNIS: That is certainly our
13 position. I think it's in the reply where we talk about
14 the City of Mesa case. And maybe it's in the motion. But
15 that's not the basis for this motion.

16 COMMISSION COUNSEL JENNINGS: I understand.
17 But it does, seems to me, go to your point as to why
18 should the commission take up the issue if, in fact, the
19 land underneath it was already withdrawn and is owned by
20 the federal government and withdrawn from the public trust
21 for other public uses?

22 MR. MCGINNIS: There are several --

23 COMMISSION COUNSEL JENNINGS: To wit, the
24 public conveyance -- water conveyance system.

25 MR. MCGINNIS: If you get into that, there

1 are a couple of different reasons, aside from what we've
2 got in our motion, one of which is the -- Dr. Littlefield
3 talked about the last time -- the water power designations
4 which withdrew land or designated land outside of the
5 public domain. There were also reclamation withdrawals
6 which were under a different statute for Roosevelt. And
7 Roosevelt itself is unique to some extent because in
8 addition to those, the federal government went out and
9 purchased and condemned the property underneath the
10 reservoir before it was built. So I think the City of
11 Mesa case makes it clear, but the United States holds
12 title to that. We didn't put that in our motion because
13 our motion really deals just with what the statute says
14 about what you're supposed to do.

15 I think those other issues come up if you do
16 make a finding of navigability for Roosevelt, if it stands
17 up on appeal, and then the State goes to trial, a quiet
18 title action against the United States under the Federal
19 Quiet Title Act, which is, I assume, where it would go.
20 Then all those reservation withdrawal questions really
21 come up more squarely there than they do here.

22 COMMISSION COUNSEL JENNINGS: And the idea
23 would be to what purpose would the State have in claiming
24 title under the public trust doctrine to lands under
25 600 feet below water? Is that --

1 MR. MCGINNIS: I'm perplexed by that one
2 too, but I can't speak for the State about what their
3 purpose would be for claiming that.

4 I guess the other thing that -- where one of
5 those issues, the reclamation withdrawal issue, probably
6 would be if you made a finding of navigability, then you
7 go to the public trust determination that you make and
8 sort of the -- the second stage is -- that we have never
9 gotten to -- and those other issues will probably come up
10 there too.

11 COMMISSIONER BRASHEAR: Is this land under
12 Roosevelt Lake somehow different from a military
13 reservation or a national forest or a national monument or
14 other properties that the federal government owns?

15 MR. MCGINNIS: It's the same to the extent
16 that the title is held by the federal government. It's
17 different to the extent that it was reserved or purchased
18 or condemned, however they got it, for different specific
19 purposes than military reservation. I mean, every
20 reservation has a different purpose why the United States
21 got it in the first place. We think, when we get into
22 this -- if we get into this -- that the reservations for
23 Roosevelt were different than a reservation for -- Indian
24 reservation for example -- or military base or anything
25 like that. Because here it was withdrawn for a specific

1 purpose. It was tied to the fact it's a lake which is, I
2 think, different.

3 COMMISSION COUNSEL JENNINGS: Mr. Chairman,
4 one other thing, is there any other lakes or lands that
5 pertain to lakes that will come under this same motion or
6 rule that you're proposing that the commission adopt to
7 not take jurisdiction in this matter? Is there any other
8 thing that we need to look at down the road?

9 MR. MCGINNIS: Not that I know of. We've
10 looked all over the United States to find another
11 reclamation project. It was the 1902 Reclamation Act.
12 It's odd because it had to be after the Reclamation Act
13 and before 1902 and before statehood, which for Arizona
14 was 1912. I think maybe there are only one or two other
15 states -- not counting Alaska and Hawaii -- that had
16 statehood after 1902. So really the big dams, like
17 Roosevelt and Salt River dams, didn't really start until
18 1902 when the federal government decided they were going
19 to pay for them. I don't know of any other ones in
20 Arizona that's a prestatehood dam.

21 COMMISSION COUNSEL JENNINGS: That's what I
22 was getting at. There aren't any other in Arizona that
23 are similar to the situation of Roosevelt. It's a unique
24 issue in that sense. Is that correct?

25 MR. MCGINNIS: Well, my firm represents the

1 people who have dams on the Salt and the Verde and the
2 Gila and the Agua Fria. And those are the ones I know
3 about pretty well and none of those are before 1912. Now,
4 is there some other small dam somewhere on some
5 watercourse before 1912, none that I know of. But I -- we
6 haven't found one. I can't tell you for sure, but I don't
7 think so. I know there are some dams in little Colorado,
8 for example, I think, that were early, but I don't think
9 they were before 1912. And I just don't know about them
10 as well as I do the ones that we represent. But my answer
11 is I think not.

12 COMMISSIONER BRASHEAR: Refresh my memory,
13 are there any natural lakes in Arizona?

14 CHAIRMAN EISENHOWER: Yes, Mormon, Stoneman.

15 COMMISSIONER BRASHEAR: What are we doing
16 about those?

17 MR. MCGINNIS: Those wouldn't come under the
18 man-made -- I think wouldn't come under the man-made water
19 conveyance system exclusion in the statute because they
20 are not man-made, would be my first thought off the top of
21 my head. But Stoneman Lake, I think --

22 COMMISSIONER BRASHEAR: It's not a
23 watercourse, per se. It doesn't go anywhere. It just
24 fills up and evaporates.

25 MR. MCGINNIS: But the definition of

1 watercourse in the statute does include lakes.

2 CHAIRMAN EISENHOWER: Yeah.

3 COMMISSION COUNSEL JENNINGS: I think the
4 only other two natural lakes are Mormon Lake and Stoneman
5 Lake.

6 CHAIRMAN EISENHOWER: Those are the only
7 ones that I know of.

8 MR. MCGINNIS: Thank you.

9 CHAIRMAN EISENHOWER: Is there anybody who
10 would like to speak to this issue on the jurisdiction of
11 this commission vis-a-vis Roosevelt Lake?

12 MR. HELM: My name is John Helm. I'm an
13 attorney, and I represent Maricopa County. I would
14 suggest to you that the request is way overly broad if
15 it's even valid at all. I thought that the Court of
16 Appeals, in *Defenders of the Wildlife*, put a stake in the
17 heart of that argument. They specifically dealt with
18 diversions, and any way you slice it, that dam is a
19 diversion. All right. And let me just quote you, this is
20 under *Diversions*, it says, "Appellees" -- and that happens
21 to have been Mark's client at the time -- "failed to
22 support this section of the statute and we are unable to
23 comprehend how such a presumption of non-navigability. We
24 therefore conclude that section 36 is inconsistent with
25 *Daniel Ball*." Now, that's what you're here to do, to be

1 consistent with Daniel Ball and if you go off and you're
2 not consistent with Daniel Ball, we're right back where we
3 were five years ago. We're back up to Court of Appeals,
4 Court of Appeals is going to tell you you were
5 inconsistent with Daniel Ball, and we're back in the ball
6 game again.

7 Let me talk to you for a minute about
8 federal law on this subject because that's what controls
9 it, all right. There's no question, prestatehood, that
10 the federal government had the right to dispose of land
11 under navigable waterways. That's probably as
12 well-established law as there could be. But if they were
13 going to do that, they had to do certain things and the
14 two cases that you should be concerned with are the Holt
15 State Bank case and the Cherokee and Choctaw versus the
16 State of Oklahoma case.

17 On the second case, you can find my
18 fingerprints on it because I argued it in the 10th Circuit
19 Court of Appeals for the United States. That holding
20 says, in Cherokee-Choctaw, that if the United States wants
21 to withdraw/give away/sell land under a navigable stream,
22 they've got to declare it, so you look at the deed. Have
23 they got a deed where the United States declares prior to
24 statehood that they gave away the land under Roosevelt
25 Lake that would have otherwise been navigable? If they

1 don't, they got a problem. If you look at Holt State
2 Bank -- and it's simple, it says -- Holt State Bank United
3 States Supreme Court case -- it says, "It follows from
4 this that the disposal by the United States during the
5 territorial period are not likely to be inferred and
6 should not be regarded as intended unless the intention
7 was definitely declared or otherwise made very plain."
8 Okay.

9 The Choctaw-Cherokee case was a fight over
10 the Arkansas River and the oil rights, all right, under
11 that had been taken by the State of Oklahoma for -- I'm
12 not sure when -- when was it that the Sooners ran, the
13 1870s or whatever -- but they have been taking the oil
14 royalties that ultimately the Cherokees and the Choctaws
15 were entitled to because they claimed that they owned the
16 land under it as a navigable river, and the Supreme Court
17 said, "No, no, no. The United States gave those tribes --
18 they were part of the five civilized tribes -- those water
19 rights before you ever became a state. Sorry, State of
20 Oklahoma, you don't get it, and get your checkbook out."

21 The other thing, you have to remember what
22 the standard is. And I would hate to see this issue get
23 confused because the standard that you measure is natural
24 and ordinary. All right. That's federal law. All right.
25 That's how you measure what's -- what's navigable and

1 what's not navigable. All right. That's stated about as
2 clear as you can read it in the Defenders of Wildlife
3 case, that's our seminal case on navigability to date in
4 the State of Arizona. All right.

5 Well, I would suggest to you that short of a
6 beaver dam, you won't find a natural dam made out of
7 concrete or brick in the world. It didn't happen. It's
8 not a natural structure. All right. And since it's not a
9 natural structure, and you're directed to determine the
10 river according to the natural and ordinary standard, I
11 would suggest that you have to omit the impact of
12 Roosevelt and look at that place like that water flowed
13 through there and everything like that. What happens
14 outside of the river to the extent that they're federal
15 land is an entirely different question. Because there's
16 no trust right in those lands outside -- no footing
17 doctrine of impact on those lands outside of the mean high
18 water marks of the river. All right.

19 So that's a whole different deal. Sure,
20 feds could give that away, deed it away, sell it, do
21 whatever they wanted if they owned it at any time
22 prestatehood, post-statehood, but that river occupies a
23 special place. All right. And I would suggest to you
24 that the Defenders of Wildlife case put a stake in the
25 heart of "you don't consider dams." It's dead. They said

1 it in the case. And to say, "Well, we've got a statute
2 that says otherwise," what are you going to do? Are you
3 going to take the Court or you going to take the statute?
4 If you take the statute, we're cooked.

5 One of the jobs you got to do is harmonize
6 this stuff when you have conflicting situations. What I
7 would suggest, if you conclude that, that you go ahead and
8 make your finding and treat the river just as it was, and
9 we can shake this out in court if necessary without having
10 to come back and do it all over again. I'd like to avoid
11 that. I mean, I've made nice friends on your commission
12 over the years that I have been here so much, but we'd all
13 like it to come to an end. So my suggestion -- it's kind
14 of a compromise -- is go ahead and treat it like -- and
15 make your findings about it, as it's navigable or it's
16 not, and Mark will have plenty of opportunity to fight
17 that out in the Superior Court or the Supreme Court or the
18 Court of Appeals or wherever he wants to go if he really
19 believes that the Defenders of Wildlife don't destroy that
20 issue.

21 (Mr. Helm is answering questions.)

22 BY COMMISSIONER BRASHEAR:

23 Q. Are you telling us that we should assume
24 jurisdiction over Roosevelt Lake or we should not?

25 A. Not all of Roosevelt Lake. The river portion.

1 Q. The river portion.

2 A. In fact -- I forget who -- I think it was Mr.
3 Jennings who asked, "Why would you worry about land 600
4 feet down under? Why would the State?" And there's a
5 couple of real simple answers; one is cash. You know,
6 under the standard that I'm most familiar with, it would
7 be value of the land and whenever they occupied it plus
8 statutory interest then to now, so cash. And the reason I
9 say "cash" is, it would have been illegal for the State
10 to give it away, and so if the feds couldn't have given it
11 away, the State got it in 1912, they couldn't have given
12 it away without that cash because it would be a violation
13 of gift law. So I'm not telling you, "Deal with Roosevelt
14 Lake because Roosevelt" -- I mean, I fish there. I was
15 there last weekend flashing the water.

16 There is a lot of that lake that isn't in
17 the river, and you probably don't have jurisdiction over
18 that. But as the river goes through that lake, you've got
19 to deal with these issues of the public trust, Defenders
20 of Wildlife, the Cherokee and the Choctaw case, the Daniel
21 Ball decision, Holt State Bank; and every one of those
22 says you deal with it unless the Salt River Project can
23 show up with their deed that says the federal government
24 withdrew it. And it's got to say that. You can't infer
25 it. If you look at Cherokee and Choctaw, you can't infer

1 that by just meets and bounds that includes it. That's
2 not enough.

3 Q. All right. In your argument, you made reference
4 to the natural and ordinary.

5 A. Uh-huh.

6 Q. Does the phrase "natural" mean that we go back
7 the days before Indians were hunting mastodon in these
8 parts?

9 A. That's correct.

10 Q. In the beginning of time, whichever way we think
11 it happened, is -- that is the -- that was the last day of
12 the natural way in Arizona and all the other stuff that's
13 happened since is unnatural?

14 A. It's not necessarily unnatural under various
15 definitions of unnatural. For purposes of the equal
16 footing doctrine, you don't consider the Verde. All
17 right. That's unnatural. All right. You don't consider
18 man-made dams. That's unnatural. All right. You can't
19 just say, oh, the word "natural" has this broad context
20 that we all use in everyday life and apply to some very
21 specific, very technical case law and history that's gone
22 on about the equal footing doctrine.

23 Q. Is that ordinary -- are those the exclusive
24 terms?

25 A. They are terms of art. There's absolutely no

1 question about that.

2 Q. But it's an oxymoron. It's either natural or
3 ordinary, but it can't be both.

4 A. Not within federal jurisdiction because
5 ordinary -- they define it as the mean high water mark.
6 All right. That's ordinary. All right. Okay. So
7 natural is controlled by ordinary, because natural would
8 say we take a flood, wouldn't we? That's the widest
9 extent. All right. So you put the ordinary on it and
10 we've got a limitation on natural. That's what I'm
11 saying, you can't just apply logic without putting it in
12 the context of a long, long history of Supreme Court cases
13 and jurisprudence in this United States and back to
14 England. You can run it back to Roman law if you want, if
15 you're a real history buff. It's just simply that portion
16 of the river in its natural and ordinary condition, you've
17 got your own Court of Appeals telling you to do that. I
18 don't know what to say. The Court of Appeals made
19 perfectly clear that the legislature can't change the
20 Daniel Ball standard. They said it. I mean, they said
21 not once, but they said it 16 times in Defenders of
22 Wildlife.

23 Q. I thank you for the explanation, and I will
24 observe. I don't understand why logic escapes the law
25 constantly.

1 A. Don't think I'm here to make that argument.

2 CHAIRMAN EISENHOWER: Thank you.

3 COMMISSION COUNSEL JENNINGS: Mr. Chairman,
4 may I ask a couple questions of the witness -- or the
5 counsel?

6 CHAIRMAN EISENHOWER: Sure.

7 MR. HELM: Lawyer. I'm not a witness.

8 BY COMMISSION COUNSEL JENNINGS:

9 Q. Would you agree this commission is a creature and
10 was created and the powers that were given to us were by
11 the legislature?

12 A. Uh-huh.

13 Q. So that we only have the power to consider what
14 the legislature has told this commission to do. Is that
15 correct?

16 A. Huh-uh.

17 Q. Now, are you arguing that the Holt case -- I
18 think you call it the Defenders of Wildlife.

19 A. Holt's the other end of the name.

20 Q. That it mandates that we consider --
21 notwithstanding what the legislature says -- that we go
22 ahead and consider the navigability of Roosevelt Lake?

23 A. Well, if you want to get us in a separation of
24 powers argument, I would make that argument to you. But
25 what I would suggest to you is that the legislature, in

1 its last piece of wisdom on what you're empowered with,
2 told you to do it according to the Daniel Ball.

3 Q. I'm not arguing about Daniel Ball. What I'm
4 trying to get at -- are you saying that even though the
5 legislature has specifically excluded the Colorado River
6 from our consideration, that because of the Holt case, we
7 must go and consider the question of the navigability of
8 the Colorado River?

9 A. No. That's a bad example. And the reason it's a
10 bad example is because that's already been determined
11 navigability and you aren't here to redetermine rivers
12 that have already been determined navigable.

13 Q. And the legislature's told us not to.

14 A. That's fine.

15 Q. Well, now the legislature has also said here that
16 man-made -- that watercourses means the main body and so
17 forth but then excludes water conveyance systems as
18 defined -- man-made water conveyance systems as defined by
19 paragraph four of the same section.

20 A. Curtis, can I ask you a question?

21 Q. No, you can't, god dang it.

22 Included in that is -- in paragraph B is, "a
23 municipal, industrial, domestic irrigation or drainage
24 water system including dams, reservoirs, and diversion
25 facilities." Are you saying that notwithstanding that the

1 legislature has made that statement, that because some
2 judge on the Court of Appeals wrote a decision that says
3 that and we have to do it anyway?

4 A. Yep. And let me help you out a little.

5 Q. Let me ask you one other thing then. Have you
6 considered the fact that this statute was written and
7 passed by the legislature after the Hull decision?

8 A. Absolutely. And therefore, the legislature knew
9 what the Hull decision said, didn't they?

10 Q. And maybe decided to overrule it.

11 A. The legislature can't overrule it in those terms.

12 Q. Well, there are many examples of the legislature
13 changing.

14 A. I agree with you, but not on the -- the equal
15 footing doctrine predetermination when you're making it
16 under federal law. The last time I checked, the
17 legislature of the State of Arizona was subordinate to
18 federal law, and I think we even regrettably have a few
19 cases in Arizona that say -- that have gone to the Supreme
20 Court where the Supreme Court admonished us because
21 with -- we were passing statutes that were apposite to
22 federal law. The point being that the standard that the
23 legislature set up for you was the Daniel Ball standard.
24 The Daniel Ball standard says that you don't consider
25 dams. So you've got a conflict within that statute.

1 Q. The Daniel Ball decision says nothing about dams,
2 it was an admiralty case and it dealt with navigation on a
3 river having to do with admiralty decisions.

4 A. No question about that.

5 Q. I don't quibble with the principle it states, but
6 it doesn't mention dams or anything else in it like that.

7 A. Curtis, the interpretation contained in Defenders
8 of Wildlife versus Hull says it does. And it says, "We
9 therefore conclude that section 37-1128-D-4 is
10 inconsistent with the Daniel Ball test." Now, that means
11 that you and I might disagree with those guys, but those
12 guys have found that part of the Daniel Ball test includes
13 diversions. It includes dams. It includes sluices or
14 whatever you got that you're taking water out of a natural
15 watercourse.

16 I understand where you're coming from, but
17 you've got to harmonize that language. I can suggest to
18 you how it would harmonize beautifully, but the
19 legislature really intended was what the legislature
20 intended. That language to mean, if you've got a canal
21 over here that's carrying 10,000 CFS, it would be
22 navigable under any federal test you wanted to make. And
23 what the legislature is telling you is don't go running
24 afar and take jurisdiction over that type of artificial
25 conveyance and look at it. And that harmonizes perfectly

1 with Daniel Ball, which is dealing with natural and
2 ordinary watercourses. That is not a natural nor ordinary
3 watercourse. It harmonizes. So regrettably, Curtis, we
4 see the law 180 apart, and I don't think I can convince
5 you of it, and I don't think you can convince me of it.

6 Q. I'm only trying to get your position.

7 A. My position is -- you've heard it. The river
8 portion of the lake should be considered, and I have
9 arguments to present on it.

10 Did somebody else have a question? I'm
11 sorry.

12 MR. MCGINNIS: I would like to respond to
13 Mr. Helm, but I'll get back up after everybody else. If
14 anybody has anything to say, I'd rather wait for the end.

15 CHAIRMAN EISENHOWER: Does anybody else wish
16 to speak to this issue? We're actually talking about the
17 navigability of Roosevelt Lake and not the Salt River.
18 And I understand Mr. Helm's position, vis-a-vis the river,
19 and that's, I think, kind of a separate issue from the
20 lake per se. And we're discussing the lake at this point.

21 MR. MCGINNIS: So much for keeping this a
22 short item on the agenda. I apologize for that.

23 Two things I guess I want to say. First of
24 all, Mr. Helm didn't participate -- wasn't here the last
25 hearing. But he says if they have a deed, then it's not

1 an issue. Well, we do have a deed. The deeds are in the
2 record. The Federal Reservation Acts are in the record.
3 The withdrawals are in the record. Dr. Littlefield last
4 time had a map of the reservation withdrawals that you
5 saw. All the deeds -- a big pile of these we filed that
6 show the United States acquired the title under the dam
7 before the dam was built.

8 As a matter of fact, in some of those
9 instances, Mr. Helm's own client, Maricopa County,
10 acquired the title from the private ownerships and then
11 conveyed to the United States. So it's clearly -- it was
12 conveyed to the United States, reserved to the United
13 States for the purpose of building a reservoir for
14 irrigation. That's really what it was about.

15 Second of all, with respect to his argument,
16 Mr. Jennings, about the Defenders of Wildlife case. I
17 would like to point out two things. First of all, the
18 statute we're relying on today, 37-1101-11, was in
19 existence in the Act before the Hull case was passed.
20 That statute and definitions there were not challenged in
21 the Hull case. The Arizona Court of Appeals did not --
22 contrary to what he tried to lead to you believe this
23 morning, the Arizona Court of Appeals did not knock down
24 this part of the statute. The portion of the statute that
25 that court dealt with was a presumption, if you remember

1 all the list of presumptions in old statute that said if
2 there are diversions from the river you have to assume
3 it's non-navigable -- presume it's non-navigable. The
4 court said you can't do that. The court didn't deal with
5 this provision. The provision, again, the expectation in
6 the definition doesn't say you should find that the river
7 below the lake was not navigable. That's not what this is
8 about. This provision just says the old river below the
9 lake is outside your jurisdiction, you shouldn't do
10 anything with it. If somebody wants to raise that issue
11 later on or today, they can do it, but they can't do it in
12 front of you. That's the difference. He wants to talk
13 about harmonizing the statutes, this does not go to the
14 Daniel Ball test, this goes to what is the scope of this
15 commission's jurisdiction, which is very different. It's
16 not saying it's not navigable, it's just saying you
17 shouldn't deal with it.

18 I think that's all I have.

19 I guess last thing is, Mr. Helm says that
20 the man-made waters conveyance system is all about --
21 definition is all about canals. Well, it's not all about
22 canals because the definition said -- in the definition
23 says "including dams, reservoirs and diversion
24 facilities," so it's not just about canals. It's about
25 dams, reservoirs, and diversion facilities too. That's

1 37-1101-4C -- 4B. And I'm sure Mr. Jennings can quote it.

2 Thank you.

3 CHAIRMAN EISENHOWER: Is there anybody else
4 that wishes to speak to the issue of navigability of the
5 Roosevelt Lake?

6 With that, we will close that part of our
7 hearing and we will go on to next item on our agenda. And
8 that would be -- and I'll have -- just some quick
9 housekeeping. We're going to adopt the Pima County Small
10 and Minor Watercourse Report. We've all had a chance to
11 see the draft report, and we've given our corrections to
12 our counsel. And I will ask if there is any questions
13 about the Pima County Small and Minor Watercourses?

14 Mr. Miller? Ms. Echeverria? Mr. Henness?
15 Mr. Brashear, any questions?

16 If not --

17 COMMISSIONER MILLER: I move to motion for
18 the report.

19 CHAIRMAN EISENHOWER: I have a motion and
20 second to accept the report on the Pima County Small and
21 Minor Watercourses. All those in favor say aye.

22 COMMISSIONER ECHEVERRIA: Aye.

23 COMMISSIONER HENNESS: Aye.

24 COMMISSIONER MILLER: Aye.

25 COMMISSIONER BRASHEAR: Aye.

1 CHAIRMAN EISENHOWER: Opposed?

2 So be it. We've adopted the Pima County
3 Small and Minor Watercourse report.

4 Our next issue is -- this is where we get
5 into fun -- hearings on the evidence regarding the
6 navigability or non-navigability of the Gila River. And
7 with that, I will ask the State Land Department and their
8 representatives to come forward and make their
9 presentation.

10 MS. HACHTEL: Good morning, I'm Laurie
11 Hachtel with the Attorney General's Office representing
12 the State Land Department. This is usually Cheryl's
13 hurrah, but I think that she purposely stepped out so that
14 she didn't have to do it. If I could introduce John
15 Fuller, who is the -- our expert and will do a
16 presentation on the Gila River.

17 CHAIRMAN EISENHOWER: Thank you, Laurie.

18 MR. FULLER: Mr. Chairman, members of the
19 commission, my name is John Fuller, the principal of JE
20 Fuller Hydrology and Geomorphology, and I'm here to talk
21 to you about navigability studies that were done for the
22 Gila River. And I'm using this PowerPoint presentation.
23 I also have members with the study team, I'll be
24 introducing them as they come along. At the end of that,
25 we have an additional speaker to talk about boating in

1 general. I guess the best place to start out is to point
2 out that the Gila River is a long river. It crosses from
3 border to border. It crosses the state of Arizona. It
4 flows in the Colorado River ultimately near Yuma and comes
5 out at the Gila National Forest in New Mexico; that's the
6 state line right there. And in reference to our
7 discussion earlier, is right about here.

8 If we look at the western side, you see
9 where the major tributary comes into the Salt River, so
10 this is a map of the western part and it encompasses most
11 of what -- the lower Gila River report as it was earlier
12 presented to you. And we also did a -- there was a
13 separate report done for the upper Gila which extends from
14 the New Mexico border down to Safford and comes out the
15 Gila boss. As I mentioned, there were two -- actually two
16 studies.

17 The first study was done chronologically,
18 covered the area from the Colorado River confluence up to
19 Safford, Arizona. That original report was done in 1994
20 and was done by staff at the State Land Department. Our
21 firm did a revision of that, attempting to remove language
22 from the earlier report -- earlier version of the report
23 that referenced part of the statute that had been struck
24 down. The original team members with the Land Department
25 that worked on the history, hydrology, and land use

1 portions of the report. The firm SWCA did the archeology
2 under contract with Land Department and will be speaking
3 to that portion of the report. And then Arizona
4 Geological Survey -- that would be under contract to us,
5 Gary Huckleberry wrote that report on the geomorphology
6 section, so that was a separate chapter.

7 The second report is the upper Gila River
8 navigability study and that covered from Safford up to the
9 New Mexico border. That original report was done by the
10 consulting firm George V. Sabol Consulting Engineers. Pat
11 Quinn was the project manager. That report was revised in
12 a similar manner, as mentioned earlier, by our firm in
13 2003. It was done by George V. Sabol, but our firm was
14 the sole project manager for that particular report. We
15 worked on the geomorphology, hydrology, and preparation of
16 the report itself. SWCA did the archaeology, history, and
17 land-use portion of that report. You see we brought
18 together the team. Both of these reports cover the five
19 subject areas that we talked in the past: archaeology,
20 history, hydrology, geomorphology, land use, and boating.

21 Picture at the left here is Gila River at
22 Pima Road bridge near Safford, and this is from a report
23 recently done by the Bureau of Rec and the title of this
24 report is "Gila River at Bank Full Conditions." Again,
25 our reports were orientated at answering two questions:

1 To look at the actual or historical use of the river for
2 navigation, and also to address the susceptibility to
3 navigation of the river.

4 At this point, I'm going to ask Dennis
5 Gilpin to speak to his findings on archaeology and
6 history.

7 MR. GILPIN: Good morning, Mr. Chairman, and
8 members of the commission. I'm Dennis Gilpin, I work for
9 SWCA Environmental Consultants. I'm a historical
10 archaeologist, and as John said, my role in this project
11 was I supervised the archaeological study of the lower
12 Gila, below Safford. And I contributed some information
13 to the historical study of that reach, although I didn't
14 actually do any writing on that.

15 I also wrote both the archaeological and
16 history reports for the upper portion of the Gila above
17 Safford. The main thing I want to say is that in those
18 studies we identified nine accounts of boating along the
19 entire Gila between about 1846 and statehood. One of
20 those accounts was an account of boating from state line
21 to state line. Another one was described putting in --
22 into the San Francisco River at Clifton, floating down to
23 the Gila, going all the way to Sacaton, then transporting
24 the boat over land to Phoenix and then taking it on down
25 to Yuma. There were a couple of accounts that described

1 boating between Phoenix and Yuma. There were a couple of
2 accounts -- two accounts -- that described boating between
3 Phoenix -- or Maricopa and Gila Bend, and then there were
4 three accounts that described boating between
5 approximately Gila Bend and Yuma.

6 The earliest of those chronologically was
7 the account in 1846 -- or the winter of 1846/1847 during
8 the Mexican War in which the Mormon battalion took the
9 route pretty much following Interstate 10 across southern
10 Arizona, went to Tucson, journeyed to -- down the Santa
11 Cruz to the Gila and then, somewhere about 70 miles or so,
12 they said, above the mouth of the Gila, they took their
13 wagons and converted a few of their wagons into rafts,
14 which they then used to transport -- they were trying to
15 transport some of their supplies down to the mouth of the
16 Gila. It was not a successful experience. They were
17 forced to leave their corn and their flour, which they
18 really needed -- they were forced to leave that behind to
19 get the wagons -- which the wagons slash rafts, which they
20 didn't need, and their troops all the way down to the
21 mouth of the Gila, so that was really an unsuccessful
22 experience and the commander, Captain Philip St. George
23 Cooke, in his journal bitterly denounced his subordinate,
24 Lieutenant George Stoneman, for basically not warning him
25 that this wouldn't work, and then once he tried it, not

1 being successful.

2 Despite that bad first attempt, the '49ers
3 apparently did do pretty much the same thing that the
4 Mormon battalion tried and they apparently did it
5 successfully. We have a couple of accounts there. One is
6 an account of a particular group of '49ers who described
7 doing just that, transporting some of their stuff down the
8 Gila from about Gila Bend to the mouth.

9 There's also an account in which a '49er
10 wrote to the New York Tribune and described how -- and
11 this wasn't real specific -- but he described how, in
12 general, a number of '49er groups did that, they would
13 lighten their loads when going across the desert by
14 transferring some of their goods and equipment onto rafts
15 or both or whatever and taking them on down.

16 We did have sort of a fairly long gap --
17 about the 1880s that we start to see what is -- in most
18 cases, are sort of recreational attempts at boating the
19 Gila. In 1881, Buckey O'Neill and two others took a boat
20 that they named the "Yuma or Bust" and they both floated
21 it and apparently dragged it part way from Phoenix to
22 Yuma, and it took them about six days.

23 Also in 1881, two men named Cotton and
24 Bingham announced that they were going to take an 18-foot
25 flat-bottom skiff from Phoenix to Yuma. We really don't

1 know whether or not that was successful. In 1895, a guy
2 named Amos Adams and J.W. Evans, or possibly G.W. Evans,
3 put it in at Clifton. And this is the one where they put
4 in at Clifton on the San Francisco, floated down to the
5 Gila, took the Gila to Sacaton, and then transported it
6 over land to Phoenix, and then went on down from Phoenix
7 to Yuma.

8 In 1889, there was a ferry boat that was
9 being used at the Maricopa Wells Fair, and they attempted
10 to float that down to Gila Bend to use at that ferry
11 crossing, but it made it about 40 miles and then it hit a
12 snag and broke in half. So that was unsuccessful.

13 In 1905, there was a guy named Jack Shibley
14 who went from Phoenix to Gila Bend and capsized once. And
15 in 1909, Stanley Sykes is said to have actually gone the
16 entire river from the New Mexico line all the way to Yuma.

17 Also during the territorial period, ferries
18 were really common along the Gila. They were pretty
19 regularly spaced. The lower -- most of them I know was at
20 Dome, which is near -- just above Yuma. There's the one
21 at Gila Bend, Maricopa. There's one at Lawrence. The
22 Mormon ferry, which was at Maricopa Wells, was apparently
23 established in 1867 and used for 25 years. The big year
24 for ferries was 1905 when a lot of ferries sprung up along
25 the river, and of course, that was a major flood year.

1 We also have accounts of people using boats
2 all along the river and especially up as far as Safford,
3 which apparently didn't have a ferry, but there were boats
4 used in flood times to cross rivers. None of these, of
5 course -- these ferries and boating across the river, they
6 don't represent boating up or down it, but I think that
7 they address the issue of susceptibility in terms of
8 demonstrating that there were times when the Gila was
9 large enough that one needed -- and so full of water you
10 had to come up with a way of getting across it and it was
11 obviously full enough of water that one could use a boat
12 on it.

13 In all the historical research -- I
14 mentioned this at the last meaning -- in all the
15 historical research, you really have to question the
16 reliability of your data and you have to evaluate --
17 critically evaluate it. And we have a number of, sort of,
18 criteria that we use. Including the -- trying to get at
19 the intent of the author. Whether or not there's
20 corroboration in some way of what we see. In the
21 document, we're interested in knowing if the document --
22 or the description is consistent with what's known
23 generally about the time and place of which it's written.
24 And then we sort of look at documents across the full
25 range to see if they all present a consistent picture. In

1 the case of the accounts that we have of navigation -- of
2 boating on the Gila, we have mostly newspaper accounts,
3 but we do have a military report, we have some journals,
4 we have some books, and we have a transcribed tape -- oral
5 history tape, so there's a broad range of accounts here.

6 We have seen that there are several
7 different intents on the parts of authors. I mean,
8 there's obviously Captain Cooke of the Mormon battalion is
9 writing in his journal in part for his own purposes, but
10 that will get turned into a military report, and he's
11 trying to place blame for his failure on his subordinate.

12 We have examples of '49er writing journals
13 about their experience. There's probably at least one
14 account, the Amos Adams and G.W. Evans account, this is
15 kind of a colorful story, and there may be some stretching
16 of the truth there. But it doesn't -- it's not enough to
17 discount the fact that that may have actually occurred.

18 Overall, I think what the picture that we
19 get from this is, is that -- and this has to do with sort
20 of internal consistency of reports, the consistency across
21 the -- whether it's consistent with what we know about
22 Arizona and the Gila River at the time that these were
23 written. Consistency, as a body of documents, is that
24 boating of the Gila was pretty rare, but we also have to
25 recognize that what we're looking at is a sample, and we

1 really can't determine whether or not it's a 5 percent
2 sample or 95 percent sample, but it is a sample of what's
3 out there. We do think it's a substantial-sized sample
4 because all of these events are still newsworthy, and in
5 most of the cases on the Gila, where it's reported in the
6 newspaper, with the exception of the '49er, who are
7 described in something that is routine, it really does
8 appear that it's still newsworthy to take a boat down the
9 Gila throughout most of history.

10 It's also fairly sporadic, it didn't happen
11 that often. It's mostly recreational. The exceptions to
12 that are the Mormon battalion, they were boating the river
13 to boat the river, they were doing it because they wanted
14 to get someplace. And the same thing is true with the
15 '49er. They weren't boating just for the fun of it, they
16 were trying to get someplace. And the ferry boats, they
17 were actually trying to transport the ferry boats from one
18 location to another using the river, and of course, it was
19 unsuccessful. That also brings up -- we have these two
20 unsuccessful cases, the Mormon battalion case and the
21 transport of the ferry, but the others met varying degrees
22 of success --

23 CHAIRMAN EISENHOWER: Excuse me, Mr. Gilpin,
24 are there any -- Mr. Brashear, do you have any questions
25 for the witness?

1 Mr. Hennes? Mr. Miller?

2 COMMISSIONER MILLER: Yes.

3 What portions of the year were these
4 navigation trips planned? Because, you know, you go back
5 into 1895 and you have tremendous drought. You could walk
6 across most of these rivers. Then you hit the wet spell.
7 And I'm sure that had to be in the spring.

8 MR. GILPIN: In some cases, we don't have
9 dates, like the discussion of the '49ers where the guy
10 wrote to the New York Tribune. It was sort of "This is
11 something that generally happens." The Cooke -- the
12 Mormon battalion, that was over the winter, December to
13 January, 1846 to 1847. The others, I don't have. John
14 may have that.

15 MR. FULLER: Mr. Chairman, Mr. Miller, the
16 dates -- I'll just read off the months and the accounts we
17 have. December-January time frame, unknown, unknown.
18 November, February, April, February, February, March,
19 March, March, April, December, August, February, so
20 there's a waning toward wintertime use.

21 CHAIRMAN EISENHOWER: Is there any other
22 questions from the commissioners? Is there anybody -- any
23 audience who would like to ask Mr. Gilpin any questions?

24 MR. FULLER: Mr. Chairman, would it be
25 possible to finish our presentation, because I think some

1 questions may be answered along the way here.

2 CHAIRMAN EISENHOWER: They might have
3 specific questions at this time for Mr. Gilpin.

4 MR. FULLER: Okay.

5 CHAIRMAN EISENHOWER: If you'll come down to
6 that microphone, state your name and who you represent.

7 MR. HESTAND: May it please the commission,
8 my name is John Hestand. I am here on behalf of the Gila
9 River Indian community.

10 (Mr. Gilpin is answering questions.)

11 BY MR. HESTAND:

12 Q. Sir, am I correct that as an expert on historic
13 use of boating, that the American Indians who resided in
14 the areas of rivers would develop means of using the river
15 as a highway of commerce and transportation?

16 A. With regard to the Gila --

17 Q. No, no, no. Generally. This is a general
18 question, then we'll go to the Gila River.

19 A. I would say that there are groups that have used
20 the rivers and some that have not.

21 Q. If an Indian tribe lived consistently in the area
22 of a river and the river was essential to their life and
23 survival, would they make maximum use of the river,
24 including using the river as a means of transportation and
25 commerce?

1 A. Again, I can think -- I wouldn't make that broad
2 of a generalization.

3 Q. Okay. Were American Indians capable of
4 developing devices that could be used as means of
5 transportation and commerce on rivers?

6 A. Yes, they were.

7 Q. Have you studied whether the Akimel Au-Authm
8 Indians -- and that's the Pima Indians -- have ever in
9 their history used boats or other devices along the Gila
10 River in the area that is now encompassed within the Gila
11 River Indian Reservation as a highway of commerce or
12 transportation?

13 A. I actually don't recall that we addressed that
14 specifically with the -- with the Au-Authm Akimel.

15 Q. Okay. Would you believe that this would be
16 important in determining whether or not a river was
17 navigable prior to statehood, as to whether or not the
18 Indians who had resided in that area for 2,000 years had
19 ever used the river as a means of transportation or
20 commerce?

21 A. It is. And we did, I think, describe the use, by
22 the river, by humans. We did find -- and the reason I
23 bring this up is we did find descriptions of the river
24 used, using rafts on the Colorado, for example. We also
25 found an example -- or an account describing how the

1 Chiricahua and Apache built bull boats which they used on
2 just rivers generally, bull boats being hide-covered
3 frames that they used for crossing rivers. And just in
4 the course of our research, I don't believe that we found
5 anything specifically like that for the Tohono.

6 Q. No, not the Tohono.

7 A. I'm sorry, Au-Authm Akimel.

8 Q. Okay. The Tohono Au-Authm are the desert people,
9 the Akimel Au-Authm are the river people?

10 A. Right.

11 Q. The Pima Indians.

12 Now, you've talked about the fact that when
13 Indians used boats for means of transportation or commerce
14 that there are records of them.

15 A. Right.

16 Q. Okay.

17 A. In some cases.

18 Q. Okay. And in the case of the river people of the
19 Gila River, you have no knowledge of any record of any
20 nature that at any time over the last 2,000 years these
21 people -- these river people ever used that stretch of the
22 river that is currently encompassed within the Gila River
23 Indian Reservation as a highway of commerce of
24 transportation. Is that correct?

25 A. I do not recall that.

1 Q. I'm not asking if you recall. Do you know of any
2 instance?

3 A. I can't give you an instance in which I know that
4 that occurred.

5 Q. Okay. I'm going to ask you some hypothetical
6 questions here. If an Indian tribe such as the river
7 people engaged in regular commerce with Mexicans, the
8 Spanish, other Indian tribes, the human tribes, the
9 Yavapai, the Hopi, if a river were capable of being used
10 as a highway of commerce and they were moving items such
11 as food, would you expect, if it was possible to do so,
12 that they would have done so?

13 A. Not necessarily. There are instances in which --
14 it may be more efficient for them to carry the material
15 than it would be to actually use the river for that
16 purpose.

17 Q. Okay. So you're saying that it's more efficient
18 for people to carry on their backs something than to use a
19 river to transport it?

20 A. If that is the case. It may be -- that may be
21 the case in some instances. And if that is the case, I
22 would predict, hypothetically, that they probably would
23 not use the river, they would probably carry it.

24 Q. Okay. So basically what you are saying is if the
25 river can't really effectively be used, they'll carry it?

1 A. Right.

2 Q. Very good.

3 If a river were a viable means of
4 transportation and you had a military/political
5 confederation made up of the river people and the
6 Piipaash -- or the Maricopas -- where they lived stretched
7 out along the river on both sides of the river and were in
8 a position where they had to have mutual defense against
9 other Indians who would come in and raid for purposes of
10 stealing food, horses, women, and children --

11 MR. SPARKS: Especially women.

12 BY MR. HESTAND:

13 Q. Yes, Pima women were extremely attractive.

14 -- and a river were capable of being used as
15 a highway of transportation, would you expect that army to
16 use the river as a means of transportation in order,
17 first, to do commerce within their confederation; second,
18 to visit relatives within their confederation; and third,
19 as a means of getting their army from one place to another
20 to defend against invaders, as a means of transportation?

21 A. Again, I think it would -- it really depends on
22 efficiency and effectiveness. And if there are more
23 efficient and effective ways to accomplish that, I think
24 that they would not use the river. If that is the most
25 efficient and effective way of accomplishing those goals,

1 then they probably would.

2 Q. And so, if they never did it in the entire
3 history of their 2,000 years, would that indicate that it
4 was never efficient or practical for them to do so?

5 A. I think it would indicate that it was -- that
6 generally, it was not as effective or efficient to do so.
7 I think -- and this is just sort of based on cultural law,
8 if you will -- the way the culture operates is that it
9 takes a while to recognize the effectiveness and
10 efficiency of an opportunity. And it only -- so it may
11 actually -- there may be events or moments in time when it
12 becomes really effective and efficient for someone to
13 adopt a new cultural trade or new practice. But unless
14 it's a fairly long-term thing, they wouldn't take
15 advantage of it. You have to have a certain length of
16 time for people to recognize it and then to actually make
17 the cultural and technological change.

18 Q. Is it your contention --

19 CHAIRMAN EISENHOWER: Excuse me,
20 Mr. Hestand, we have a long way to go today.

21 MR. HESTAND: One more question and I'll be
22 done.

23 CHAIRMAN EISENHOWER: Okay. Thank you, sir.

24 BY MR. HESTAND:

25 Q. Is it your contention that the Akimel Au-Authm,

1 the river people, were so unsophisticated that over a
2 period of 2,000 years living and depending on a river,
3 living within a mile of the river, at all times, they were
4 so unsophisticated that they could not figure out to build
5 a raft?

6 A. No, that is not will -- not my contention.

7 Q. Thank you, sir.

8 CHAIRMAN EISENHOWER: Thank you, Mr. Gilpin.

9 John, please finish.

10 MR. FULLER: This is one reason we preferred
11 to go through -- some of the questions he was asking would
12 have been better answered by other people during the
13 presentation -- as part of our presentation.

14 So Dennis was telling you about the
15 archaeological history and historical information that was
16 put together. There's information in the report about the
17 extensive irrigation use in the Gila River, fish
18 populations, location of population centers up and down
19 the river, historical accounts where people did boating as
20 Dennis mentioned, as well as descriptions of the river and
21 the water there.

22 We also have -- at the end of our talk,
23 Barbara Tellman will speak to us, reminding us of some
24 information she submitted for the small and minor
25 watercourses, types of boats that were in use. With

1 respect to the questions that were just asked, I also
2 would point out that I don't know that we have full
3 records of everything that the various Native American
4 communities did. We do know that there were certain types
5 of boats they used in certain places to a limited extent.
6 We don't have written records, obviously, so it's harder
7 to research. There is in our report a reference to some
8 of the boat materials that would be used that would tend
9 not to be preserved. Also in Barbara Tellman's report,
10 she starts out with a Tohono Au-Authm creation story which
11 interestingly involves a canoe. So the concept was not
12 unknown to them. Be that as it may, let's move on.

13 The next topic we looked at, geomorphology.
14 Again, because the two different reports by Gary
15 Huckleberry were talking about what we refer as the lower
16 Gila River, by that I mean everything below Safford. I
17 worked on the upper Gila River, everything above Safford,
18 and we'll present that information separately. So I will
19 ask Gary here to speak. And just so you know, Gary will
20 speak, I will speak and wrap up, and then we'll have
21 Barbara speak at the end.

22 MR. HUCKLEBERRY: Good morning. My
23 presentation lasts about 10 minutes.

24 CHAIRMAN EISENHOWER: Would you identify
25 yourself for the record?

1 MR. HUCKLEBERRY: Yes. I will begin by
2 introducing myself. I'm Gary Huckleberry. I am an earth
3 scientist born and raised here in Phoenix, actually grew
4 up right down the street from here, this is kind of a
5 homecoming for me. I have a Ph.D. in geosciences from the
6 U of A, and I graduated '93. After that, I was professor
7 at Washington State University for nine years. My wife
8 and I got tired of the rain. We just recently moved back
9 to Tucson. And I now am an adjunct faculty member at WSU,
10 but I make my living as an engineer consultant.

11 So let's begin with -- next slide. There we
12 go.

13 Project background on this, when I was
14 working on my dissertation in the early '90s, I was also
15 working at the Arizona geological survey and mapping basin
16 deposits, including stream terraces along the middle Gila
17 River. And in 1993, I completed my doctoral dissertation,
18 which was an archival stratigraphic study of the middle
19 Gila River. That is, I both looked at the historic
20 documents of historic channel changes, and then also put
21 in some backhoe trenches in the floodplain and dated flood
22 deposits, prehistoric flood deposits.

23 During the same time, I also worked on a
24 report, the historical geomorphology of the Gila River as
25 part of data collection for determining the navigability

1 of the Gila River at the time of statehood.

2 CHAIRMAN EISENHOWER: Quick comment --
3 question, what do you define as the "middle Gila"?

4 MR. HUCKLEBERRY: I will show that in the
5 next slide, but essentially, to answer your question
6 immediately, essentially from the Asherthene dam to the
7 mouth of the Salt.

8 Actually, as John was saying earlier, this
9 is obviously a very large river. It drains 60,000 square
10 miles, approximately, and it has -- you can divide this
11 river up into different reaches. What I have done here is
12 divided up into three main reaches, the lower Gila River,
13 middle Gila River, and upper Gila River. These are the
14 parts that I studied.

15 The upper Gila River included a part from
16 essentially the Gila Box down to the San Carlos Apache
17 Reservation, another short segment between Winkleman and
18 Kelden. The middle Gila River where I did my doctoral
19 dissertation work, essentially, as I said, from the Asher
20 Staddon down to the mouth of the Salt, and then the lower
21 Gila River essentially from the mouth of the Salt down to
22 the Colorado River. And again, I just want to stress that
23 being a large river, it's a fairly complex system and each
24 reach really has its own unique characteristics.
25 Obviously as you go downstream, geology changes, the

1 topography changes, the catchment area changes, so I like
2 to think that each of these segments has to be considered
3 individually.

4 Methods. What I did is -- obviously I
5 compiled a series of archival records; general land
6 office, or GLO, maps; as well as photographs, various
7 historic accounts of the river. Obviously also considered
8 various principals of geomorphology. That is, how does
9 the channel change in response to changes of discharge and
10 sediment load? Also was very interested in looking at
11 recent river behavior, in particular the 1993 flood,
12 perhaps as an analog to floods that were occurring around
13 the time of statehood as well.

14 Took much of this information and plotted
15 the historical channel positions of 1 to 24,000
16 topographic maps, and also as a field component to this
17 where I'd go out and observe and actually did survey, not
18 only as part of my dissertation but also some additional
19 work on the middle Gila River and lower part of the upper
20 Gila River.

21 Before I talk about the individual reaches,
22 let me begin general observations. These are very dynamic
23 components of the landscape, rivers in general. And if
24 you look at rivers in dry lands, in deserts, very much so
25 because the discharge is fluctuating so much. As you

1 alluded to earlier, talking about how much water in the
2 channel can vary depending on the time of year you're
3 there, so these are rivers with discharges that vary quite
4 a bit, and the channel has to accommodate those
5 fluctuations in flow. What we have seen is -- because
6 floods change the morphology of the channel, that's a
7 dynamic channel and -- because flood frequency will change
8 through time in relationship to climate -- climate
9 variability.

10 So the pattern that we have seen on the Gila
11 is an increase in large flood frequency and magnitude
12 tends to favor wide, braided conditions; whereas periods
13 of few floods, relatively dry conditions, we tend to see a
14 condition where they tend to be a narrow, single, low-flow
15 channel. And again, this idea here, the flood regime
16 changes through time because climate changes through time.
17 We're looking at a creature that is moving and then our
18 goal is to try to take a snapshot in February 1912 and see
19 what position that creature was in that time.

20 Beginning with the upper Gila River, here we
21 have the good fortune that there was a very comprehensive
22 study done by Burkham in 1972 as part of a study by the
23 U.S. Geological Survey in early 1970s of the Yavapai
24 study. And this -- what he did in his 1972 publication is
25 essentially looked at historic documents, GLO plots, and

1 other archival accounts, and basically did a history of
2 the channel changes up into the '70s. And looking at some
3 of those historic documents, what we see in 1870s when
4 some of the first GLO plats were surveyed, the upper Gila
5 River in the Safford Valley consisted largely of the
6 single narrow channel. And certainly this is corroborated
7 by various historical accounts by some of the first
8 settlers coming into the area.

9 Then, as you are probably already familiar,
10 there were a series of large floods around the turn of the
11 century -- particularly 1905, 1906, and 1916 -- on the
12 upper Gila River seem to result in some considerable
13 channel changes. And it's pretty well documented by this
14 map here which was constructed by Olmstead in 1919 which
15 shows essentially the channel as he said it was in 1903,
16 which is the single sort of ribbon coming through here.
17 And then the channel as it was in 1916, which is this more
18 hash wider section next to it. So the large floods
19 obviously had an impact on the channel. The flood channel
20 particularly was widened and my estimate is in 1912 we had
21 pretty much a wide, braided flood channel. The middle
22 Gila River, here the -- really the historical channel
23 changes had not been documented systemically until I did
24 my doctoral work. And again, much like Burkham, I turned
25 to early GLO surveys. And some of the surveys of this

1 reach in the river go back to 1860s as well as the 1870s;
2 pretty much indicate a single deep channel, and this is
3 corroborated by a lot of historic accounts because this
4 was a thoroughfare for Anglo-Europeans working their way
5 out west as early as the late 1840s. So a lot of the
6 accounts seem to support the maps that were drawn later
7 that a single channel was pretty common at that time.

8 Now, subsequent surveys occur after 1905 and
9 1906 when the river experienced tremendous flooding, and,
10 of course, in 1916. This photograph on the right is --
11 was taken in 1915 near Sacaton. And which shows a pretty
12 wide, braided flood channel. I love this picture because
13 I'm interested in the impact of floods on society both in
14 past and present and these are some Akimel Au-Authm
15 reconstructing a head gauge on the Santan canal that was
16 blown by the floods in channel cutting. But nonetheless,
17 certainly around the time of the statehood, I estimate
18 that the middle Gila River largely had a wide, debraided
19 flood channel at that time.

20 Moving down to the lower Gila River, again,
21 we have a series GLO surveys, they extend all the way from
22 the 1860s up to 1890s. Most of those seem to indicate a
23 low-flow channel that dominates a single channel, much
24 like this low-flow channel here taken in '92 near Wellton
25 downstream from Painted Rock Dam, which later was

1 subsequently overwhelmed by the flood down below in '93.

2 There are some conflicting historic accounts
3 though. Some indicate a wide, shallow lower Gila River
4 where others suggest a deep, narrow single channel and it
5 may be that people are describing different reaches --
6 maybe the bedrock reach was more than a single channel,
7 the alluvial reach was wide. They might be describing a
8 compound channel, where you have a low-flow channel that's
9 narrow and deep and set within a much broader, braided
10 channel system that someone else is describing. So I'm
11 not really sure how to accommodate those conflicting
12 accounts.

13 We do know, though, that unlike the middle
14 and the upper Gila River, there is probably a series of
15 channel changes occurring in 1891, and that was a very
16 large flood, particularly on the Salt; much of that water
17 coming out of the Salt and escaping along the bank and
18 widening it at that time, further maintained by the floods
19 of 1905, 1906, and 1916. So my best estimate is that --
20 at least certainly for the alluvial reaches of the lower
21 Gila River, we have a wide, braided flood channel in 1912.

22 So my conclusions: One, obviously again,
23 the Gila River has a dynamic floodplain that changes in
24 response to changing flood regime. The period 1905 to
25 1916, a 12-year period that includes, obviously, the

1 Arizona statehood, that was the wettest period in at least
2 three centuries based on tree branch studies that were
3 done, particularly on the upper Gila River watershed. So
4 we had a lot of water going through the system during that
5 period. Increased large flood frequency leads to
6 generally wide, braided flood channel along most of the
7 alluvial reaches of this channel. In between those
8 floods, when water is -- there's less water going through
9 there, we do have a low-flow contained within one or more
10 narrower channels, called the low-flow channel. And I'll
11 conclude with that.

12 CHAIRMAN EISENHOWER: Okay. I'll let John
13 finish up then we'll have questions for everybody.

14 MR. FULLER: I'll just take over, and I'll
15 try to be very brief here and wrap up quickly. I know
16 that it's lining up behind me.

17 The geomorphology of the upper part, two
18 sections moving upstream from Safford, that's called the
19 Gila Box, a relatively deep canyon confined by bedrock;
20 river remains perennial in that reach. Then upstream of
21 that, we cross what used to be Route 66, it is now 191, up
22 through the Duncan Valley, it begins an alluvial stream, a
23 much broader valley. It's naturally perennial through
24 that channel and there it's just more sinuous.

25 The Bureau of Reclamation study they looked

1 at that was mentioned earlier describes that meandering
2 slightly different up there, similar more to what's
3 between Safford and San Carlos. So in summary, with
4 respect to the geomorphology, we do find great variation
5 over the entire river. It's important that when you're
6 asking questions and trying to delve through some -- work
7 through some of this information, that you think about
8 what reach are you talking about. Is it a canyon reach?
9 There are several of those. Is it one of the alluvial
10 valleys? So you have variation in geology and the channel
11 pattern throughout.

12 And we also find that there is a flood
13 channel, which has certain characteristics, and a low-flow
14 channel within that, which also has characteristics.
15 Typically we boat on the low-flow channel for the flood
16 channel has to be broader and greater than during the
17 floods. It's not the smartest time to be on the river.
18 We do find that flood impacts are significant to this
19 river. It does change the shape and the location of the
20 low-flow channel as well as flood channel. And also we
21 found that humans have significantly impacted in changing
22 the natural character from what it was to what it is now.
23 And that would be building the levees, encroaching on the
24 flood plain for agricultural use, bridges, diversion of
25 the water, those sorts of things.

1 Speaking of the water, the next section
2 would be the hydrology, and we present quite a bit of
3 information in the report. For the sake of brevity right
4 now, I'm going skip through these slides and let you know
5 the information that is in there. I will say to you that
6 the entire river was perennial prior to taking the water
7 out artificially.

8 The river, once you get past the box, turns
9 into exotic rivers; that means its source of flow is much
10 further away, not derived from adjacent to the river
11 primarily from the upper watershed. The Nile is the
12 classic example of an exotic river. So flowing through
13 the desert, we have this source that's derived from the
14 mountain up above. We have ranges in flows, and we slice
15 and dice that different ways. We gathered our information
16 primarily from USGS data, also from irrigation records,
17 mouths that they were diverting, also from historical
18 accounts. So we took whatever sources we could find in
19 the course of our extensive data collection effort. There
20 are a number of gauges that were present at the time of
21 statehood. Those flow rates are recorded in the Land
22 Department's report in the hydrology chapter for both
23 reaches of the river, staying back before statehood --
24 some gauges obviously started after statehood -- at the
25 period of record that is in there in the report, and we

1 also see that the average annual flow is not
2 insignificant. Several hundred range.

3 Again, as we have spoken before, this a
4 desert river so floods tend to skew the averages above the
5 mean, so we also record the median information. We also
6 report average minimums, average maximums. We report a
7 wide variety of data so that the commission can see the
8 range of data. And again, these are standard
9 methodologies that are used that are normally relied on in
10 the course of hydrology studies.

11 Let's just skip past these. Archeological
12 data -- we also did rating curves -- determine what would
13 the depths be that would go with those flow rates. From
14 these data, you can determine where the river is 90,
15 99 percent of the time. What range would you normally see
16 it excluding what? You see that 99 percent of the time
17 the flow is within reasonable ranges.

18 I also have chapters in there regarding
19 historical accounts of boating, which Dennis talked about
20 in some detail. One note on that we didn't mention was
21 that there was some steamboat use at the very lower end of
22 the Gila up to about where Dome is today. So there was
23 some larger boats in very early history like that on the
24 Colorado. The more we took the water out, the less
25 boatable it was for that type of boat. And apparently,

1 they were coming upriver to get wood, and there are
2 several reaches where modern recreation and boating occur
3 right now.

4 The Gila Box is a popular boating area that
5 is managed by the Bureau of Land Management. There's a
6 reach upstream of Winkleman, about a 16-mile reach, where
7 people canoe when water is being released from San Carlos
8 and Coolidge Dam. And then there are some people that
9 like to boat in which is basically affluent and irrigation
10 water exchanges between the Salt River confluence with
11 Granite Reef Dam. Those are the information that
12 summarizes briefly, not as brief as I hoped, but of what
13 we presented, and I would be happy to answer questions.
14 Meanwhile, why don't we answer questions on this part,
15 then we have Barbara speak?

16 CHAIRMAN EISENHOWER: One other thing, if
17 you would manage to get a copy of your PowerPoint
18 presentation to Mr. Mehnert, I would appreciate it.

19 MR. FULLER: I will do that.

20 CHAIRMAN EISENHOWER: There might be some
21 questions from Mr. Huckleberry and also -- Mr. Miller, do
22 you have any questions?

23 MR. MILLER: No, I don't.

24 (Mr. Fuller is answering questions.)

25 BY COMMISSIONER BRASHEAR:

1 Q. One, the earlier reiteration of this dance with
2 the yellow brick road is that when we -- on the Gila, when
3 we got close to the Salt, there was area in there that
4 dealt with backwater that was -- wasn't really Gila River
5 water, it was Colorado water, and I think we had a
6 technical determination of where that was. Is that
7 calculated in what you've told us? Is that still there?
8 Because you mentioned the boating going at the dam there,
9 and I just wondered if you --

10 A. As I was saying, I was not the author of that
11 report. That's a separate report that was submitted to
12 the commission specifically for the backwater area. The
13 community of Dome, which is where it was thought that
14 steamboating went up to -- in very early Anglo history --
15 is upstream of the backwater.

16 Q. How far from --

17 A. Dome is -- you know, I don't specifically, but I
18 believe it's in the range of 18 miles, something like
19 that.

20 CHAIRMAN EISENHOWER: Mr. Jennings, do you
21 have any questions?

22 BY COMMISSION COUNSEL JENNINGS:

23 Q. This up to Dome, was this prestatehood?

24 A. Yes.

25 Q. Or approximately at statehood?

1 A. My understanding is it was prestatehood.

2 Q. So what about at statehood, 1912 itself? Was
3 there actual water that would allow steamboats to go up
4 the Gila River in it or are we talking, as Mr. Brashear
5 said, the backwater from the Colorado?

6 A. By the time of statehood, I don't believe there
7 were any steamboats in operation at all on the Gila River.
8 And the exact reason of that probably has to do with the
9 lack of flow. In the month of February at the Dome gauge
10 in 1912 it says "No flow is recorded," and the same for
11 the previous and the next month. And that's a condition
12 that is similar today. But by 1912, of course, we had --
13 Roosevelt was filling. So they were only releasing the
14 water that they had to. And there were plenty of
15 irrigation diversions up and down the river that were
16 depleting the water supply.

17 Q. If you can answer this, would the data in the
18 report submitted to us regarding the back flow of the
19 Colorado going up the Gila, would that still be valid
20 information?

21 A. Yes.

22 CHAIRMAN EISENHOWER: Are there any
23 questions for Mr. Fuller from the audience?

24 MS. GOLDBERG: I'm Rebecca Goldberg on
25 behalf of the Salt River Project. I have some questions

1 for Mr. Fuller and for Mr. Gilpin on the archeology and
2 historical sections of their two reports.

3 (Mr. Gilpin is answering questions.)

4 BY MS. GOLDBERG:

5 Q. I guess the first question -- I'm not sure
6 whether it would be for you or Mr. Gilpin -- just in
7 general, in the archeological sections of the two reports,
8 there was no evidence of any boating on the Gila River
9 specifically -- I know there were some questions in
10 general prior -- even though many of these prehistoric
11 populations lived near the river. Is that correct?

12 A. That's correct. I do want to reemphasize the
13 adage that absence of evidence is not evidence of absence.

14 Q. Thank you.

15 Turning now about some of the sections on
16 your history of the Gila River. And I think we covered
17 this a little bit earlier, but the evidence about the
18 Indian tribes that were located near the Gila River, there
19 was no evidence in the report that any of these
20 populations used the river for boating. Isn't that true?

21 A. As I mentioned before, there is the account of
22 bull boats being used by the Apaches, but there are no
23 Apaches, although it wasn't specific to the Gila and
24 there's also the account of the river -- humans using
25 rafts to cross, specifically, the Colorado, but it's the

1 same tribe as the Maricopa. It would be both.

2 Q. But there are no accounts on the Gila?

3 A. Oh, yeah. There's also the -- and John reminded
4 me -- there is reference in the Coronado expedition to the
5 Rio de -- River of Rafts, and there's a couple of -- one
6 interpretation of where that name came from is that it
7 referred to Native Americans using rafts, but the other is
8 actually used by the Coronado expedition. The Coronado
9 expedition, in fact, was required to construct rafts and
10 to get across one of the rivers between the Sonoran Desert
11 and the highlands, which could have been the Salt River,
12 we don't know.

13 Q. But it is not clear, based on your evidence that
14 you looked at, that it was the Gila River. Is that
15 correct?

16 A. That's correct.

17 Q. And regardless of which river the Coronado
18 expedition was referencing when they used that term River
19 of Rafts, they used that to cross the river, correct?

20 A. That's correct.

21 Q. Not to travel up and down?

22 In your report, you also talk about, along
23 with the Coronado expedition, some other explorers that
24 came into the area in the mid-1500s, I believe -- later
25 you talk about Spanish expeditions, Spanish explorers, Don

1 Juan Bautista de Anza -- and that you talk about his
2 traveling along the Gila. That is, as far as based on
3 your evidence, that trip was over land. Is that correct?

4 A. That's correct.

5 Q. The same question with a later Spanish explorer,
6 Juan de Yarte -- and I apologize, I'm sure I'm butchering
7 his name here.

8 A. That's okay.

9 Q. -- reported that he also explored the lower Gila
10 River and there was no evidence that that was on the
11 river, that it was over land?

12 A. That's correct, it was over land.

13 Q. Later in 1800, you talk about trappers that came
14 to the Gila River, and isn't it true that there's no
15 evidence that any of these trappers ever boated the Gila
16 River?

17 A. That's correct. And I think you mentioned before
18 there is evidence that they boated the Colorado.

19 Q. But there is no evidence that they used those
20 boats or canoes?

21 A. That's correct.

22 Q. Later you also talk about, in 1800, the army
23 explorations that came through the area, surveying the
24 area. Isn't it true that there is no evidence that they
25 traveled on the Gila River, most of their travel was over

1 land?

2 A. The exception was the Mormon battalion.

3 Q. Sure. And I hadn't mentioned that earlier. And
4 you said that that was an unsuccessful trip and that they
5 had to leave provisions on the side of the road. Is that
6 correct?

7 A. On the side of the river.

8 Q. On the side of the river, excuse me.

9 A. That's correct.

10 Q. I wanted to ask you some questions about some of
11 the historical boating accounts specifically. And I have
12 just a chart of some of them, and I wanted to offer a copy
13 of this chart into evidence to the commission.

14 You earlier had mentioned that there were
15 nine accounts. I counted some more, and maybe one or two
16 that you had mentioned I didn't capture, but I wanted to
17 ask you some questions about that.

18 First one, number 1, we already talked
19 about. You mentioned that trip was unsuccessful.

20 The next accounts I wanted to talk about are
21 numbers 2 and 3, what you called the '49er accounts. The
22 first one, Edward Howard party, it's in your report that
23 this happened in 1849, but isn't it true that you don't
24 have information on what time of year this was taken?

25 A. That's correct.

1 Q. Same question for the next boating account,
2 number 3, where there was the letter to the New York Daily
3 Tribune about the '49er account. Again, we don't know
4 what time of year this was taken?

5 A. That's correct.

6 Q. There were a number of ferries operating on the
7 Gila River, as you mentioned earlier, and I just wanted to
8 clarify that there is no information in the record that
9 any of these ferries were used to cross the river other
10 than, as you mentioned, the 1889 trip with the ferry?

11 A. I suppose you misspoke. You said that there was
12 no evidence that they were used to cross the river.

13 Q. They were only used to --

14 A. They were used only to cross the river.

15 Q. I apologize.

16 A. Except for the one event where they were trying
17 to transport the ferry boat itself down the river and was
18 unsuccessful.

19 Q. Wouldn't you agree that essentially these ferries
20 operated similar to how a bridge would if there were a
21 bridge there?

22 A. Yes, a conveyance across the river.

23 MR. FULLER: Except that they were on water.

24 MS. GOLDBERG: Right.

25 BY MS. GOLDBERG:

1 Q. Would you agree that there is no evidence that
2 what time of year these ferries operated on the river or
3 what percentage of the year -- portion the year they
4 operated?

5 A. There is evidence on that. I don't know that
6 it's in our report. But there's -- there are several
7 accounts of -- newspaper accounts that described the
8 operation of ferries. And one go can through and -- in
9 the report, I'm sure that there are newspaper accounts,
10 and they will list the date of the newspaper account that
11 describes the operation of the particular ferry.

12 Q. But you don't know what percentage of the year
13 these ferries operated, whether they are -- were
14 year-round operations or certain seasons?

15 A. Well, I don't know that answer.

16 MR. FULLER: I have a question. Do you have
17 information regarding what season of the year they were
18 used?

19 MS. GOLDBERG: I don't. I'm just asking if
20 you did. I'm just basing it on your information in the
21 report.

22 MR. FULLER: We're here to find facts. I'm
23 curious.

24 BY MS. GOLDBERG:

25 Q. The next boating incident that you mentioned and

1 I want to ask you a couple of questions about was number
2 5 -- excuse me, number 6, about Buckey O'Neill who
3 departed from Phoenix in a boat called "Yuma or Bust."
4 Isn't it true that in one of your newspaper articles in
5 the report, the editor of the paper said that they pushed
6 the boat a great portion of the trip?

7 A. That's correct.

8 Q. And then they were wading in the water?

9 A. That's correct also.

10 Q. And they didn't actually boat on the boat their
11 whole trip from Phoenix to Yuma. Isn't that correct?

12 A. That's correct.

13 MR. FULLER: Actually, in that account, it
14 does describe them boating to a certain point and then
15 they were seen happy in the mud or something. It also
16 mentions the boat itself was a 20-by-5-foot flatboat that
17 they had built. It also mentions that they consumed their
18 entire liquor supply, so I'm not sure their boating skills
19 were really good.

20 MS. GOLDBERG: I must have missed the liquor
21 portion of that report.

22 BY MS. GOLDBERG:

23 Q. My next question is about the 5th boating
24 account, also in 1881 -- February of 1881, the two men
25 who, in the article, they were to take off the next day,

1 and I believe you had said that we don't know for sure if
2 trip actually happened. You don't have any further
3 evidence?

4 A. That's correct.

5 Q. And a couple of questions about the trip that
6 G.W. Evans or J.W. Evans and his companion Adams took down
7 the San Francisco River down to the Gila. It appears to
8 be that one of the reports is a letter to editor by Evans.
9 Isn't that correct? That he was reporting on the trip
10 himself?

11 MR. FULLER: I think so, yes.

12 MS. GOLDBERG: And they discovered there
13 were a number of problems on this trip. Isn't that true?

14 MR. FULLER: They ran into some trouble when
15 they got to below what's now San Carlos, went through the
16 canyon there. They actually, I think, broke the front
17 half of their boat off and had to line the boat through.

18 MS. GOLDBERG: And what I read, in addition
19 to that, they hit a number of serious rapids, they fell
20 out of the boat, and they had other sorts of problems
21 along that stretch of the river?

22 MR. FULLER: Interestingly, they took
23 90 days off, they had 90 days to make this trip. They had
24 this trip and broke the boat up in this canyon reach where
25 the rapids come in. Pretty nasty. Others have boated

1 through that reach and not had that problem. So it would
2 probably be at relatively high flow rate is what I would
3 guess, but I don't know. It's not a factual part. But we
4 do know that broke their boat and then repaired it --
5 either repaired it and hauled it to Phoenix or they hauled
6 it to Phoenix and repaired and got back in their boat and
7 continued on their trip, and said, "It was a once in a
8 lifetime and that was enough."

9 MS. GOLDBERG: But they did haul their boat
10 over land, they didn't boat the entire way?

11 MR. FULLER: They didn't boat that stretch
12 from probably about eight measures down to the confluence
13 of the Salt.

14 MS. GOLDBERG: Okay.

15 BY MS. GOLDBERG:

16 Q. My next question is about a boating event that
17 you, I believe, did not mention, in March of 1905, from
18 your report, in where you talk about, in relation to some
19 of the ferries that operate on the river, there was one
20 boat that failed to cross the river? I just wanted to
21 confirm.

22 A. That's correct. And the reason I -- in my
23 summary of the nine accounts, there I was excluding
24 ferries from that series of accounts and sort of
25 summarizing it the best I can for that portion.

1 Q. I just included them all, so that's why we have
2 different numbers.

3 MR. FULLER: Are you referring to the
4 hand-driven side propeller boat?

5 MS. GOLDBERG: That's correct. That was not
6 actually boating a boat with a sail.

7 MR. FULLER: Unable to navigate the river,
8 so.

9 MS. GOLDBERG: My next question there is
10 another event in 1905, there was a boat that was intended
11 to be launched in the river, but again, that was an
12 unsuccessful attempt. Isn't that correct?

13 MR. FULLER: Which account?

14 MR. GILPIN: Number 11, March 1905, I
15 assume?

16 MS. GOLDBERG: Actually, I'm referring to
17 the next one, December 1905.

18 MR. FULLER: Yes.

19 BY MS. GOLDBERG:

20 Q. And my last question about the boating events in
21 your report is about Stanley Sykes, who is reported to
22 have canoed the entire length of the Gila River. Isn't it
23 true that in a later biographical sketch -- biography of
24 Mr. Sykes, that this boating incident is not mentioned at
25 all?

1 A. That's correct. There is an article -- a
2 biographical article on Stanley in the Journal of Arizona
3 History that did not mention this particular event.

4 Q. And isn't that true that we don't know what time
5 of the year this trip occurred?

6 A. That's correct.

7 Q. And a few other questions on the history portions
8 not related to the specific boating events. You talk
9 about a few instances when there were wire ropes stretched
10 across the river and a cage apparatus to stretch across
11 the river, and this is evidence of a cage not floating on
12 the river, but in fact, above the river to bypass it.

13 MR. FULLER: That's correct. There was one
14 case of the cage, the Jack Henness one.

15 MS. GOLDBERG: Yeah, Jack Henness one, and
16 then there's also a cage -- in your lower Gila report, you
17 talk about another wire rope and cage stretched across the
18 river.

19 MR. FULLER: The one with Jack Henness, as I
20 read -- it was a wire -- he says he was looking down at
21 the boats that were carrying things across. So it sounded
22 like there was a cage and a boat in that case. And there
23 were other cases where there were footbridges and whatnot
24 for use in crossing the river. I would imagine there are
25 probably wires in those areas too.

1 MS. GOLDBERG: But this particular account
2 was over the river?

3 MR. FULLER: I think it was both. That was
4 my recollection. Henness was up above looking down at the
5 boat. So maybe we go back and look at the exact language.

6 MR. GILPIN: That is my interpretation of it
7 as well, is that there was a ferry boat running back and
8 forth across, but in addition to the ferry, there was a
9 wire with a cage that was also -- so there are two ways of
10 getting across the river.

11 MS. GOLDBERG: But these are some of the
12 other ferries that we've already talked about in going
13 across the river?

14 MR. GILPIN: Right.

15 MS. GOLDBERG: I just have a couple other
16 questions. In your upper Gila River report -- this is
17 more for you, Mr. Fuller -- in your upper Gila report you
18 had a separate section on boating and I just wanted to
19 confirm that you mentioned that circle boating on the
20 river includes the use of boats, canoes, and rafts. And I
21 just wanted to confirm that those are only related to the
22 historical accounts that we were talking about this
23 morning. You make, I believe, a general statement and I
24 just wanted to confirm that you're only referring to the
25 boating accounts.

1 MR. FULLER: I'm not sure I understand the
2 question. Are you asking me if the historical accounts
3 are limited to low-draft boats?

4 MS. GOLDBERG: Sure.

5 MR. FULLER: Yes.

6 MS. GOLDBERG: And that is, I believe, all
7 the questions --

8 MR. FULLER: With the exception of
9 steamboats down at the bottom.

10 MS. GOLDBERG: Actually, I do have one
11 question about that. There is the evidence of steamboats,
12 which I must have missed, I guess, in your report -- those
13 operated on the very lower portions of the Gila at the
14 confluence of the Colorado. Is that correct?

15 MR. FULLER: Yes, that's correct.

16 MS. GOLDBERG: That's all my questions.

17 CHAIRMAN EISENHOWER: Is there somebody else
18 who wishes to question the witness?

19 MR. HESTAND: With the commission's
20 permission, I have a couple questions for Mr. Fuller and a
21 couple of -- for -- and I apologize, I did not catch the
22 gentleman's name?

23 MR. HUCKLEBERRY: Huckleberry.

24 MR. HESTAND: Huckleberry. Thank you, sir.

25 (Mr. Fuller is answering questions.)

1 BY MR. HESTAND:

2 Q. Mr. Fuller, since you're here, I'll deal with you
3 first. Now, I didn't mean that to sound quite as ominous
4 as it did.

5 Now, in support of your theory that the Gila
6 River was navigable, you talked about the --

7 A. Excuse me, sir. If you read the report, you'll
8 see that there is no conclusion as to fact-finding there.

9 Q. Very good. I stand corrected.

10 You mentioned the Tohono creation story
11 involving a canoe; are you aware of the fact that the
12 Tohono order are a completely separate tribe that never
13 lived anywhere near the Gila River?

14 A. Yes.

15 Q. Okay. And are you aware that the Akimel
16 Au-Authm -- or river people's creation story involved a
17 massive uncontrolled flood in which the two original
18 people were swept away uncontrolled in a ball-like thing
19 and later then deposited in the area that they currently
20 reside in? Did the ball float for commercial purposes?

21 A. No, sir, it did not.

22 Q. And am I correct that American Indians maintained
23 a detailed and comprehensive oral history, knowledge of
24 their own existence, their own practices, their own
25 culture, and these oral histories are every bit as much

1 worthy of respect as your own American history?

2 A. I'm not an expert on Indian records.

3 Q. Thank you.

4 CHAIRMAN EISENHOWER: Mr. Helm, I believe
5 you had some questions.

6 MR. HELM: Thank you. Just a few.

7 (Mr. Gilpin is answering questions.)

8 BY MR. HELM:

9 Q. First couple questions for Mr. Gilpin.

10 You indicated the Mormon battalion trip was
11 not successful and it wasn't quite clear to me. They
12 dumped the flour out, but did they get there with the
13 wagons?

14 A. They did get there with wagons.

15 Q. Okay. So they floated down the river in the
16 wagons, they just had to lighten the load a ways?

17 A. Right. And Captain Cooke flat out stated that he
18 considered it an unsuccessful --

19 Q. Sure. But all I'm saying is the wagons got
20 there?

21 A. The wagons got there.

22 Q. On the river?

23 A. Yes.

24 Q. Do you have any descriptions of the size of those
25 wagons?

1 A. I don't. They must be mentioned somewhere, but I
2 don't know where that is.

3 Q. Do you -- just from your general knowledge of the
4 kinds of wagons that would have been used in that time of
5 history, do you have any idea of how big they would be,
6 for example, how long, how wide?

7 A. I can't give you that information right now. I'm
8 sure that the information is available, but I don't have
9 that.

10 Q. Is it fair to assume that when they went to float
11 those wagons, they took the wheels off of them?

12 A. It's likely stated.

13 Q. They did.

14 Okay. Do you have any idea how deep a draft
15 those wagons would have drafted fully loaded?

16 A. I don't.

17 Q. Or, for that matter, how deep a draft would they
18 have pulled empty?

19 A. No, I don't know that.

20 Q. And I take it on the wagons that did get to the
21 mouth of the Gila, they were able to transport the people
22 that were riding in them?

23 A. That's correct. Well --

24 Q. They didn't just get there empty?

25 A. There might have been people on either side

1 dragging them.

2 Q. Somebody probably rode it.

3 A. Somebody else probably did ride in them.

4 Q. Okay. Now, you talked about the use of ferry
5 boats to some degree, and you state they were used to take
6 people across the river. Do you know the size,
7 dimensions, that sort of thing, of the ferry boats that
8 were in use?

9 A. We do have some dimensions on some of the ferry
10 boats.

11 Q. Can you tell the commission what they were here
12 now, or is that something that just is in the report?

13 A. That is in the report.

14 Q. Okay. Do you recall the draft of those ferry
15 boats?

16 A. No.

17 Q. Okay. Would it be fair to say that while those
18 ferry boats didn't go up and down the river, by the very
19 fact that they crossed the river, there was enough water
20 present in the location where the ferry boat was located
21 to float your boat, so to speak?

22 A. Absolutely.

23 Q. And the river could be used in that area for a
24 boat?

25 A. Yes.

1 By the way, you're asking about the draft of
2 some of those. I do recall one account saying that the
3 ferry boat was large enough to haul a six-horse team.

4 Q. How big would a six-horse team be?

5 A. Well, six horses.

6 Q. It's fairly large, in other words?

7 A. Yes. And that was --

8 Q. And I'm not sure whether John talked about this
9 or you do, but in your cross-examination there was some
10 discussion that the boats were all low-draft boats?

11 A. Yes.

12 Q. I.e., meaning they weren't 25 feet deep into the
13 water, correct?

14 A. That's correct.

15 (Mr. Fuller is answering questions.)

16 BY MR. HELM:

17 Q. Do you have a sense of the size of those
18 low-draft boats? I mean, I have seen records that you can
19 take a ferry boat in a foot and a half, does that qualify
20 as a low-draft boat?

21 A. Yes.

22 Q. Like a paddle wheeler? There are some accounts
23 of paddle wheelers on the Colorado that only drew a foot
24 and a half?

25 A. I'm unaware of that. That sounds reasonable.

1 Q. What I am driving at is, that kind of draft would
2 be considered a low-draft boat?

3 A. When I was -- when I answered the question, what
4 I had in mind was canoes and skiffs and whatnot, but I do
5 remember reading some things about the Colorado River
6 boats where they had specially modified the river boats so
7 that they would be lower draft.

8 Q. Do you know how much draft the river boat that
9 ran up to Dome had?

10 A. I don't.

11 Q. But that was a Colorado River boat, wasn't it?
12 That was also used on the Colorado?

13 A. I don't know.

14 Q. I have some questions. And I'm not sure -- maybe
15 I could try and group them for both you and Mr.
16 Huckleberry, if I could, John?

17 A. In terms of size of the boat -- you just asked
18 that question -- I don't know that there's answers to that
19 in the report. There are dimensions for where we know it,
20 we reported it.

21 Q. Okay. I wasn't sure, did your two guys both do
22 the geomorphology and hydrology? I got kind of confused.

23 A. It is confusing. On the lower -- the low Safford
24 report, Gary worked on the geology and the geomorphology.
25 The hydrology was done by the Land Department staff.

1 Q. Okay.

2 A. Upstream of Safford, I did that. I did the
3 hydrology and the geomorphology.

4 (Mr. Huckleberry is answering questions.)

5 BY MR. HELM:

6 Q. Let me see if I can craft the question that will
7 encompass it all. In the studies that you did on those
8 things, were those studies that looked at what was
9 actually occurring on the ground at the time you were
10 studying subject to man's invasions, the dams he built,
11 the diversion structures he built?

12 A. I'm not sure I understand your question. When I
13 was out there through the early 1990s doing my fieldwork?

14 Q. I made a note of all the ones you did, but what
15 I'm driving at is, did your fieldwork arrive at any
16 conclusions based on the natural and ordinary flow of the
17 river, i.e., without divisions from man or without
18 diversions for dams and this sort of stuff, or were your
19 studies based on records of the river that would have had
20 those diversions in place?

21 A. I wasn't looking at discharge. I was looking
22 floodplain morphology. So -- I mean, at that time, there
23 were some divisions already in place.

24 Q. Floodplain morphology, to a certain degree, is
25 controlled by the diversions that are made on the alluvial

1 river system, aren't they?

2 A. Let me rephrase that. I would say that the
3 morphology is influenced by the discharge which can be
4 modified by the diversions or irrigation.

5 Q. Sure. And all I'm asking is that the studies
6 that you did or the studies that you reviewed that other
7 people did -- I think you talked about Burkham study and
8 that sort of stuff -- were based on whatever condition the
9 river was in at the time they were studying it, not on a
10 river that had no diversions that was in what's called its
11 natural state?

12 A. If I understand your question correctly, when
13 they were studying the river, it was impacted by the
14 diversions. It was not a natural state. They also looked
15 at historic documents that went back in time. And as you
16 suggested earlier, defining natural is bug-a-boo. But
17 certainly there were less impacts in the 1800s than there
18 were in the 1900s.

19 Q. Sure. But for example, in around 1912, wouldn't
20 you agree that virtually all of the Gila had been
21 appropriated and subjected to diversions?

22 A. I can't answer that.

23 Q. You don't have any knowledge about when
24 diversions took place and that sort of stuff?

25 A. Not for the entire river, no.

1 Q. For any portions of the river?

2 A. For the middle Gila River, I'm aware of some of
3 the diversions that were taking place near Florence in the
4 1870s, 1880s.

5 Q. For example, at statehood, Roosevelt Dam was
6 already in place?

7 A. That's possibly the Salt.

8 Q. Right. But that becomes a tributary to the Gila?

9 A. Yes.

10 CHAIRMAN EISENHOWER: Excuse me,
11 Mr. Huckleberry, would you move closer to the microphone?

12 MR. HUCKLEBERRY: Yeah.

13 Correct. In 1911, I think the dam was
14 constructed so it would have been --

15 Q. And the flows at the lower Gila?

16 A. Yes.

17 Q. And that, therefore, would have influenced the
18 geomorphology on the lower Gila after the dam went into
19 place?

20 A. Yes.

21 Q. And that's, kind of, the general question I'm
22 trying to get from both of you. Is that -- I'm not
23 obviously having a very good time doing it, but -- would
24 be diversions that effected the geomorphology?

25 A. I would answer yes.

1 Q. Okay. And that none of the studies that you did
2 looked at the Gila without those diversions before the
3 white man came to the West?

4 A. Well, before the white man came to the west,
5 there were no historic documents at that time.

6 Q. Right.

7 A. Some of the early GLO plats of the rivers are
8 dated in the 1850s, and by the late 1860s, there were very
9 few diversions -- Anglo-European diversions.

10 Q. But by 1912, weren't there quite a bit?

11 A. Yes.

12 (Mr. Fuller is answering questions.)

13 BY MR. HELM:

14 Q. Same basic question for you, John.

15 A. I think I got the question. We have an idea
16 that's from systematic data would have been impacted by
17 diversions to some degree. The long-term records that
18 were available from the USGS are also impacted by
19 diversions and that's how they're reported in the USGS
20 records. And the tendency would be to lower the flow of
21 the river relative to what it would have been
22 prediversion. In terms of information we looked at that
23 was prediversion, in the river's natural characteristic,
24 the earliest records we have would have been the GLO
25 records and those sketches of the channels they drew.

1 However, those are neither coincident, really, with that
2 occurred in the watershed, and we also, to some extent, on
3 the upper Gila and to some extent the lower Gila, the
4 irrigation points and mouth that had moved. So to answer
5 your question, most of the data in the report is in a
6 watershed-disturbed condition.

7 MR. HELM: Thank you. I don't have any
8 other questions.

9 MR. SPARKS: Mr. Chairman, members of the
10 panel, my name is Joe Sparks, and our firm is Sparks,
11 Tehan and Ryley, P.C. This particular hearing we're
12 representing the San Carlos Apache tribe of the upper
13 Gila. And I just have a couple of questions for the
14 hydrologist and the geomorphologist. And I'll say an
15 introduction.

16 (Mr. Huckleberry is answering questions.)

17 BY MR. SPARKS:

18 Q. Mr. Huckleberry, I've been handling this area;
19 when I speak your name, it is with true reverence.

20 A. Thank you.

21 Q. And you see me genuflecting anywhere around you,
22 don't think it's unusual, we always do.

23 I wondered if either of you studied the
24 effect of the introduction of European grazing animals on
25 the geomorphology of the river?

1 A. No, I did not.

2 Q. Do you know whether, in your opinion, the
3 introduction of grazing animals in the Gila drainage would
4 have changed the nature of the runoff and timing of the
5 runoff of the river?

6 A. Any alteration of the vegetation in the catchment
7 area would alter runoff and the flow of the river. How it
8 would do that exactly, I don't know.

9 (Mr. Fuller is answering questions.)

10 BY MR. SPARKS:

11 Q. And did either of you study the changes of the
12 repairing of vegetation along the upper Gila River in
13 terms of the native species that were historically and at
14 the time of European contact present there, such as
15 cottonwoods, sycamores, willows, walnuts, and reeds
16 and what else? Did you study the changes in that
17 vegetation in your studies of the geomorphology of the
18 river?

19 A. I would have to say that we did not study the
20 cause directly as part of this study. We made
21 observations as to how the river changed and not
22 necessarily trying to delve down or answer that very
23 extensive debate about what does grazing do to watershed
24 or what does invasive do to the channel pattern.
25 Certainly there are impacts.

1 Q. You got to the part of the question that I didn't
2 ask yet, namely invasive species, and did you study the
3 introduction of the Egyptian tamarisk or commonly known as
4 salt cedar to the upper Gila in terms of the changes in
5 the geomorphology?

6 A. Not specifically. I think there may be a part of
7 the report where it referenced the invasion of tamarisk,
8 but again, we were looking at more of what happened rather
9 than how it happened.

10 Q. And finally, did you study the impact of
11 post-European timbering practices on the upper Gila
12 watershed on the geomorphology of the river?

13 A. No.

14 MR. SPARKS: Thank you, Mr. Chairman.

15 CHAIRMAN EISENHOWER: Are there any other
16 questions?

17 MR. HESTAND: With permission from the
18 committee, just a couple for Mr. Huckleberry.

19 BY MR. HESTAND:

20 Q. Mr. Huckleberry, will you explain to the
21 commission what a Shoshone is?

22 A. What a Shoshone --

23 Q. Shoshone.

24 A. Shoshone? I believe that is an indigenous tribal
25 group.

1 Q. No, I'm sorry. Let me put it in your own
2 American terms, then. The -- are there areas in the Gila
3 River where there are times where the river will regularly
4 go dry or virtually dry and then the geology uplifts bring
5 the ground water or subflow back to the surface,
6 recreating the stream?

7 A. On the Gila River?

8 Q. Yes.

9 A. Now we're going back a ways from reading the
10 documents. It's been 10 years, but I believe that might
11 take place at Pima View.

12 Q. Are you aware of the fact that there are a number
13 of places within the Gila River Indian Reservation where
14 the outcroppings would bring water -- subflow back to the
15 surface, when the subflow existed.

16 A. Yeah. It wouldn't surprise me. I can't recall
17 because it has been a while since I looked through a lot
18 of that hydrologic literature, but certainly it occurs on
19 the tributaries to the Gila, like the Santa Cruz. I don't
20 see why it would not also happen on the middle Gila River.

21 Q. And would the effect of that be that there would
22 be wide stretches of the river that would be dry or
23 virtually dry for purposes of navigability but the water
24 would reemerge and be available for a certain space for
25 agricultural uses, then redisappear and then come back,

1 based on the understanding that the subflow is the
2 underground river?

3 A. I think you're describing intermittent flow, and
4 during the dry season, it would not surprise me at all if
5 the middle of the river had an intermittent reach.

6 MR. SPARKS: Okay. Thank you.

7 MS. COPELAND: Kirsten Copeland here
8 representing Buckeye Irrigation Company and Buckeye Water
9 Conservation Drainage. I just have a couple of real quick
10 questions for Mr. Hucklebee.

11 MR. HUCKLEBERRY: Huckleberry.

12 MS. COPELAND: I'm sorry, Mr. Huckleberry.

13 (An off-the-record discussion ensued.)

14 (Mr. Huckleberry is answering questions.)

15 BY MS. COPELAND:

16 Q. I actually wanted to back up. I was sort of
17 intrigued by the photograph that you showed of the repair
18 work, I think, in 1915 on the -- you don't have to show
19 it -- the repairing of the head gate. I think the photo
20 was a 1915 photo?

21 A. Yes.

22 Q. And I was curious, in the discussion that has
23 been going on regarding the effect of diversions on the
24 river, on how you might compare the impact on the river
25 channel of diversions? In other words, the effect of

1 diversions versus the effects of floods on -- and of
2 course, I'm thinking of the period from about, what, 1905
3 up through and including statehood?

4 A. That is a very good question. My feeling is that
5 in terms of channel changes in the floodplain, the floods
6 have a much greater impact on the morphology of that
7 channel than the diversions do. The diversions certainly
8 can have an effect on the reformation of the low-flow
9 channel, but in terms of the overall geometry of the
10 floodplain, and particularly the flood channels, it's the
11 floods that have the greatest impact.

12 Q. And following up on that, then, is -- and I may
13 be putting words in your mouth. If I am, please tell
14 me -- but it sounds like you sort of made a distinction in
15 terms of the characteristics of the channel -- in
16 particular, the middle Gila, as you described it, and even
17 the lower Gila -- where you talked about, in probably the
18 mid- to late 1800s, there was a low-flow, more definable
19 channel on the Gila, but then the flooding -- flood
20 events -- and I recognize there was one, I think, in 1891,
21 but you identified the period more 1905 to 1916.

22 A. For the middle and the upper Gila River, the 1905
23 and 1916 floods were big. The lower Gila river, I think,
24 the 1891 flood was pretty dramatic.

25 Q. Okay. But in both instances, whatever, I guess,

1 more definable or recognizable low-flow channel may have
2 been on either stretch of that river would have been
3 significantly altered, if not essentially blown out, at
4 various times -- and I recognize you can't talk to the old
5 stretch -- but various times of flooding. Various floods
6 would have significantly changed, if not blown out,
7 whatever definable channel might have been present in the
8 early time period of preflood?

9 A. Yeah. The only thing we can really work with are
10 analogs for recent floods for that, because the historic
11 documents don't really focus on that low-flow channel
12 after it becomes a wide, braided flood channel. But based
13 on recent floods, yes, that low-flow channel does get
14 blown out, I guess -- abandoned. You may get a completely
15 new low-flow channel forming in different locations.

16 MS. COPELAND: That's it. Thank you.

17 CHAIRMAN EISENHOWER: Thank you.

18 Are there any other questions?

19 MS. HERR-CARDILLO: I'm joy Herr-Cardillo
20 representing Defenders of Wildlife. I have questions for
21 Mr. Fuller and Mr. Huckleberry, so I can --

22 (Mr. Fuller is answering questions.)

23 BY MS. HERR-CARDILLO:

24 Q. Mr. Fuller, there has been a lot of discussion
25 about diversions and maybe you covered this in your

1 report, but can you just clarify for me what diversions
2 existed on the Gila River at the time of statehood?

3 A. Well, there were a lot. I believe there were
4 several dozen in Duncan Valley alone, so there were quite
5 a number of diversions as of the time of statehood. There
6 was a major diversion at the head of the Safford Valley --
7 Solomon, I believe, is the name of the town there. There
8 was a major diversion at Hayden Ashers. And --

9 Can you speak to what is lower down --
10 Mohawk takes water some place.

11 MR. HUCKLEBERRY: Yeah. I would just add
12 that in the Safford Valley, there were several diversions
13 beginning up above Solomon -- or Solomon today -- and then
14 all the way down through Thatcher and Pima. And in the
15 middle Gila River, there were quite a few diversions in
16 the Florence area that impacted downstream diversions on
17 the Gila originally. They had canals that went back well
18 into -- well, before we actually documented them
19 historically. And below that, I'm less familiar with
20 lower river.

21 MR. FULLER: There's a list of diversions in
22 the upper Gila-San Francisco reports, to direct you to
23 that or direct the record to that.

24

25 BY MS. HERR-CARDILLO:

1 Q. And just maybe there is a stalemate on that, but
2 the purpose of these diversions was to take water out of
3 the river?

4 A. Yes. Well, to irrigate lands.

5 Q. Right.

6 A. That is how you did it.

7 Q. Okay. Were all the diversions for the purpose of
8 irrigation?

9 A. I would imagine some people drank the water or
10 turned the paddlewheel or did something else, but as I'm
11 aware of them, they are called irrigation diversions.

12 MR. HUCKLEBERRY: Yes.

13 BY MS. HERR-CARDILLO:

14 Q. And is there any way for us today to quantify how
15 much water was being taken out of the river?

16 A. Yeah. Actually there are probably others in the
17 room that are more qualified, who spent time talking
18 about -- or thinking about the Gila River adjudication,
19 and that would be one source of information as to what was
20 actually taken out. I was looking at some more
21 appropriate than was actually in river, so any given time,
22 all the water could have been removed. So the answer to
23 your question is yes, there would be that information.

24 (Mr. Huckleberry is answering questions.)

25 BY MS. HERR-CARDILLO:

1 Q. And Mr. Huckleberry, I have a question for you
2 about the wide, braided channel. My understanding from
3 listening your testimony here is that the wide, braided
4 channel was created at high flood water times, correct?

5 A. Yes.

6 Q. Okay. And then obviously that would subside;
7 what would happen to the channel once we were at low flow?

8 A. Well, you would be left with a -- still a wide,
9 braided flood channel, but the lower -- the smaller flow,
10 the lesser flow would be contained within one or more
11 smaller channels within that larger set of braided
12 channels, and that's what I call a low-flow channel. And
13 it would gradually reestablish itself. You'd have a
14 period of very few large floods for a while and it would
15 become quite distinct, but as we see between 1905 and
16 1916, there's a lot of flood going on; to what degree it
17 reestablished itself, I'm not sure.

18 Q. So there is no way for us to know today what it
19 looked like at low flow during the time of statehood? Do
20 we know whether they were single channels?

21 A. It's not recorded well in the survey notes, in
22 the documents. They tend to focus on the wide
23 floodplains -- the wide flood channels, excuse me. And
24 they don't focus so much on the low-flow channel.
25 Probably because it's moot anyways in talking of change

1 before it became reestablished. So to answer your
2 question, no, we don't have much good information on that
3 low-flow channel, at least in the study that I did on my
4 reaches.

5 MS. HERR-CARDILLO: Thank you.

6 COMMISSIONER ECHEVERRIA: Can I ask a
7 question?

8 In regards to diverting water from the Gila,
9 have you any estimate about how much water was diverted
10 from the Gila prior to the arrival of the Anglos?

11 MR. HUCKLEBERRY: In terms of Native
12 American diversions?

13 COMMISSIONER ECHEVERRIA: Uh-huh.

14 MR. HUCKLEBERRY: We know that the Akimel
15 Au-Authm practiced canal irrigation, and we know the
16 Hohokam practiced canal irrigation. Was that ever
17 quantified, I don't believe so.

18 CHAIRMAN EISENHOWER: Are there any other
19 questions for these two gentlemen?

20 MR. HELM: I just --

21 CHAIRMAN EISENHOWER: Do you have a question
22 for these gentlemen?

23 MR. HELM: For you, Mr. Chairman. It's
24 unclear to me when the State's presentation ends.

25 CHAIRMAN EISENHOWER: It's going to end

1 right now.

2 MR. HELM: And I mean the boating
3 presentation because I had one question basically that --
4 or actually two. One that was brought up just as I was
5 back there, but one I wanted to ask at the end of -- the
6 total end of the State's presentation.

7 CHAIRMAN EISENHOWER: You're there right
8 now.

9 MR. FULLER: We have Barbara Tellman that
10 would like to speak to us about boats in specific. She is
11 also a witness for the State.

12 CHAIRMAN EISENHOWER: Oh, I didn't -- I did
13 not realize that. Would you bring her up now?

14 MR. FULLER: Yes.

15 MR. HELM: I'll save the question then.

16 CHAIRMAN EISENHOWER: Okay.

17 MR. FULLER: Let me introduce Barbara
18 Tellman. Barbara Tellman is part of a number of different
19 navigability studies; most recently she was part of a team
20 that developed the small and minor watercourse.

21 CHAIRMAN EISENHOWER: Okay.

22 MR. FULLER: And so she is speaking from a
23 piece of her report as it relates to boating in general.

24 CHAIRMAN EISENHOWER: Would you adjust the
25 mic there, please?

1 MS. TELLMAN: My name is Barbara Tellman.
2 I'm retired from the Water Resources Research Center at
3 the University of Arizona. And in that capacity, I worked
4 on water policy issues and water environmental
5 history-type of studies. I participated in a number of
6 the studies for the State Land Department; particularly, I
7 wrote the history for the Virgin and Santa Cruz Rivers. I
8 wrote this history of boating for the small and minor
9 watercourses, and subsequent to that, I got very
10 interested in topic and did much more additional research
11 and extensive search for photos throughout archives in
12 Arizona and Southern California.

13 Once I had done that, I became an Arizona
14 scholar, and as a scholar, did a series of lectures on
15 boating in Arizona and about seven different communities
16 as part of a program that they had. My role here is not
17 to talk specifically about the Gila River but to talk
18 about what kind of boats were available and how were boats
19 used.

20 (An off-the-record discussion ensued.)

21 MS. TELLMAN: Okay. Basically a boat is
22 anything that -- pretty small, float on the river, and
23 could be maybe placed inside one of the steamers. The
24 steamer age was pretty much over by the time of statehood
25 on the Colorado River. I'm talking entirely about the

1 small boats.

2 To correct the misstatement that John made
3 earlier, the legend I'm referring to is the Hopi legend.
4 It deals with the origin of snake clans and the young man
5 and the Colorado, the one to know where the water went
6 that kept the flow away from him. And according to the
7 legend, he took this hollowed-out log all the way down to
8 the Gulf of California from the Colorado plateau. This is
9 a modernized rendering of that legend.

10 Native tribes from South America all the way
11 up to Alaska all had some kind of boating if they lived
12 anywhere near water. This is a Seri boat, a New Mexican
13 boat made of balsa. The Mohave and the Colorado River
14 also had a variety of rafts. This is bundles of reeds put
15 together. And the Rio de la Salsa that the Spaniards
16 referred to, at least in this case, was the Colorado River
17 and they did call it that because there were so many rafts
18 on the river. The Mohaves were said to go routinely up
19 and down the river all way from what is now about Parker
20 all the way down to the ocean.

21 They had a variety of types of rafts. Here
22 we have another design in Native America reeds, and they
23 also used small logs. They were extremely helpful to the
24 Spaniards when they came through and they were to Anglo
25 settlers when they came by.

1 This is an ingenious craft used by the
2 Hecksan tribe to carry watermelons to market and they may
3 look like a rickety thing, but it beats carrying it on
4 your head.

5 This is example of a bull boat. This tribe
6 is actually from Canada and illustrates what we're talking
7 about. The bull boat was made in Canada out of the skin
8 of one male buffalo. You can see the tail there on the
9 right. Down in Arizona, the bull boats tended to be made
10 out of cow hide. There's a wonderful description by a
11 woman who, in old age, was recalling that as a young girl,
12 she and father had traveled all the way from Idaho down to
13 the Gulf of California, trapping. And she talked about
14 how when they would get to the river, they would kill a
15 couple of their horses and make boats out of them and get
16 across the river, then discard them. At the next river,
17 they would kill some more horses.

18 This is the first inflatable boat in Arizona
19 that we know of. This is on the Ice expedition crossing
20 the Colorado River. The artist was Bobby Mullhousen who
21 had a wonderful sense of humor that described the terrible
22 time they had getting across the Colorado River in this
23 very awkward boat, which at one point tipped over
24 completely and all their supplies dumped in river. And
25 the Mohave who had their flexible raft that they could

1 steer went around and around and picked up all the
2 supplies. And it was his conclusion that they should have
3 hired the Mohaves in the first place, which a lot of
4 people did.

5 Now, what kind of boats did people have?
6 They either could order them by mail order from the Sears
7 catalog. And on this particular page, the catalog has
8 metal boats and canvas boats. They also sell wooden
9 boats. This is from the 1912 catalog. So many things
10 were easily available and could reach Arizona fairly
11 quickly by railroad. This is -- may have been an example
12 of one of the those mail-order boats.

13 This picture wasn't dated, but it appears to
14 be from about the same period. And there were manuals on
15 how you could build your own boats and canoes. This is
16 beautifully illustrated manual of boat building. Godfrey
17 Sykes was a master craftsman, and he had a boat yard where
18 he built boats right at the foot of tolinmock in Tucson.
19 This is one of his boats he built to sail in the Gulf of
20 California.

21 Another one that he used to sail on the
22 river when he was doing Salt and sea investigations and so
23 forth. He made quite a few boats. And this is the
24 houseboat that he actually built in his boatyard in Tucson
25 which carried his family for long extended trips. Now,

1 Stanley Sykes was mentioned earlier. In his old age, he
2 did write an account of his youthful trip. It was in the
3 middle of winter when he was living in Flagstaff and he
4 was sick and tired of how cold and snowy it was. So he
5 and his friends decided to see if they could go from
6 Phoenix the Yuma by boat. They built themselves this
7 little canvas boat. This is not a picture of his boat,
8 but it's what I envision it probably looked like. The
9 trip was -- the trip was quite unsuccessful. Only one
10 person could be in the boat at the time because the other
11 one would weigh it down too much. So one person would
12 walk along and pull the boat while the other one sat in
13 it, or sometimes they both would pull the boat. His
14 conclusion was, "We were dumb to do this in the middle of
15 winter. We should have done it after the snow melt."

16 There were many other imaginative designs
17 for homemade boats. This is one of my favorites. And
18 this is another, this is a duck boat. The man in front
19 has his rifle ready to aim at whatever he can get. The
20 other guy is laying down in the front. So we have a great
21 variety of homemade boats in Arizona at this time.

22 This is a toy boat that was found in an
23 archeological excavation along the Virgin River from the
24 19th century. Nothing more is known about it than it must
25 have been from child's play.

1 Crossing the river. We had some discussion
2 of that. Every river in Arizona was portable at some
3 time. And this is -- across the Colorado River at the
4 same place where at other times of year steamboats could
5 navigate.

6 We have a variety of ferries. This is the
7 famous Union Ferry. And it was obvious they were still in
8 operation even after the railroad bridge had been built.
9 This is another ferry with reference to, but have not been
10 able to follow up, I have no idea where this ferry was or
11 whether it was successful. People asked earlier about the
12 size of the ferries, they ranged drastically. This is one
13 that just made up one little old model, the -- or whatever
14 it is. This one is quite a bit bigger, probably carried
15 custom cars and some horses across the Alamo River in
16 southern California just across the border. And along
17 with the ferry, you can see a rowboat off to the left.

18 This is a picture of the Dome ferry. Again,
19 a very small boat. It operated for quite some time and
20 the location of the ferry is now where the bridge is,
21 across the Gila River.

22 Here we have a very experienced ferry. This
23 is a surveyor's blueprint of the property of Jose Redondo,
24 who was a very well-known gentleman in Yuma, was mayor of
25 Yuma, legislature, and if you look where the arrow is

1 pointing, we'll blow that up, it says "Road to Redondo's
2 Ferry." I have been unable the find anything out about
3 this ferry after extensive research, but apparently
4 Redondo did have a ferry.

5 There are lots of attempts to cross rivers.
6 Some of them were more successful than others. A number
7 of the ways to cross rivers were elevated above the river.
8 So you can see there's a cable stretched here and the boat
9 is pulled -- people are pulling on the cable as they cross
10 the river. Now is this evidence that river could not be
11 boated? Because if it could be boated, wouldn't they be
12 on the water? Well, if you look down along the shore, the
13 middle of the picture, you can see some kind of a rowboat
14 kind of thing and some kind of a flat boat along the
15 shore. There are a couple of reasons why you would
16 elevate your ferry, one of which is that this shore line
17 wasn't suitable to get your wagons down into the water.
18 The other was, you might want to hedge your bets. This is
19 the ferry at Needles. Again, in an area where the
20 steamboats were able to come some times of the year. At
21 other times of the year, the river was far too violent to
22 cross, and at some times of the year, it was way too low
23 and people would get stuck in sandbars. So you have an
24 elevated ferry high enough for the steamboats to get under
25 and you hedged your bets when you crossed the river at all

1 times of year.

2 Some of the ferries were quite unsuccessful.
3 And this is a quotation from the Florence Blade-Tribune.
4 Now, the editor of this newspaper had a wonderful sense of
5 humor. In those days, especially with that newspaper, it
6 was assumed that the local people knew the local news that
7 was going on. They would be out there watching it happen
8 and gossiping. So he had very pragmatic commentary on
9 what was going on. The question was asked earlier, what
10 was the exact size of the ferries? We don't know a lot of
11 this because what we have is just information from the
12 newspapers and they often exaggerated.

13 Here we have one of my favorite pictures.
14 This is Governor Hunt in 1916 crossing the Gila in a boat
15 on the way to inspect the prison. The reason that I find
16 this picture very interesting is when I look at the
17 newspaper articles for about that time, they talked about
18 Governor Hunt coming to Florence but there was absolutely
19 nothing whatsoever unusual about him putting his boat --
20 his car on the little boat of some kind and taking it
21 across the river. It seemed to be totally routine. And
22 the way that the editor of the newspaper tended to comment
23 on things, if there was anything unusual about this, he
24 would have said something like, "And Governor Hunt bravely
25 battled the wild seas." So this was apparently perfectly

1 routine activity.

2 But were all the ferry boats these little
3 kind of dinky little things that didn't last very long or
4 anything? This is the Nellie T. ferry system across the
5 Colorado River in the vicinity of Parker in the 1920s.
6 I'm getting a little bit out of area here just to talk a
7 little about the Nellie because she was such a remarkable
8 woman.

9 By the 1930s, her business had grown
10 extensively and she had quite an extensive fleet which
11 became part of the well-known Arizona Navy that operated
12 for a couple of days in the battle against California.

13 This map indicates the locations that I have
14 been able to identify, with the red pins indicating known
15 ferry locations, the yellow pins indicating other kinds of
16 boat travel, not just across the river but down the river
17 to some degree. The ferries actually played a very
18 important part in Arizona history. This is a sign that I
19 found under the I-10 freeway bridge where it crosses the
20 Colorado River. And the old Ehrenberg ferry was at this
21 site and this was very common throughout -- the ferry
22 locations were pretty much the places where the bridges
23 and their highways were located. And the main three
24 freeway crossings of the Colorado River were all old ferry
25 locations, and the ferry owners often were quite

1 prosperous. Daniel Binelli operated a ferry where the
2 Virgin River comes into the Colorado. You know, he was --
3 going to and from the ferry he owns a lot of land where he
4 raised cattle and he raised hay. So that anybody coming
5 across the river there had to pay him for the toll road,
6 for the ferry, for some hay, for some meat, for some fire,
7 and then they stayed overnight. And he became a very
8 influential citizen and we could still visit his historic
9 mansion in Kingman.

10 What other uses were there for boats? This
11 is one example, an army document, this raft was built, the
12 army was trying to get across the river in the middle of
13 winter, freezing cold, and without any warning, the raft
14 just sank, disappeared, and was never seen again.

15 Okay. People had boats that they had by
16 their places, this was one at a mining location. This is
17 a boat along the canal, and if you'll look way down the
18 canal, right by the house, you will see the rowboat tied
19 up by the edge of the canal. So people did have boats
20 that they used for various kinds of purposes. We don't
21 know who these people were and what they used the boat
22 for, but they did have this little boat along the canal.

23 They carried their goods to the ferries,
24 some people trying to transport their vehicles, and one of
25 the major problems was the shoreline. Look at that poor

1 horse trying to get up on the shore.

2 Gasoline boats were in use in the area by
3 1910. And flood rescue was one of the major things where
4 we have references to boating. We have this at Maricopa
5 Wells where ferry rescued people when the train would stop
6 in Maricopa Wells, and the bridge was down, the ferry
7 would take them across the river and let them get into
8 Phoenix that way. It was pretty paralyzing; this was the
9 big 1905 flood. Now, along farther up the river we have a
10 lot of descriptions of what was going on with the ferry
11 boats at that time. And there is absolutely no way that
12 we can say what the size of these ferries were because
13 we've got the newspaper editor blowing it all out of
14 proportion. He's talking about the Gila Queen, which then
15 became in great competition with the Gila King and two
16 boats were fighting for the big commercial business in
17 this area. And they got to the point where he was talking
18 about somebody being the admiral of the fleet. And you
19 just can't take any of this seriously at all. So you take
20 it with a grain of salt, so we really don't know. And
21 finally the whole competition was settled between them and
22 the stages that they could only operate on the shallow
23 reaches.

24 This is another very intriguing one. In
25 1914, the Arizona National Guard dispatched its

1 collapsable boat in Tucson. This did not work. They
2 didn't rescue the people. But what surprised me was that
3 National Guard in Tucson had a boat at all. What were
4 they doing with a boat? So I started looking in National
5 Guard records. Maybe this was standard issue and every
6 National Guard got a boat just routinely. But in those
7 days, nothing was standard issue and people pretty much
8 supplied their own things. So somebody in Tucson National
9 Guard had a collapsible boat. We don't know what he used
10 it for or why they had the boat, but there it was.

11 Boats were also used for recreation
12 purposes. Here we have a canoeist on the Arizona canal.
13 Here we have a little sailboat that was trying to go down
14 the much narrower canal. It's not clear to me whether
15 they are stuck, wedged in there or whether the wind just
16 gave out and they couldn't sail any further.

17 This is at Fort Grant where we have a sailor
18 taking a leisurely afternoon rowing on this very small
19 pond down from the fort. People used their boats for
20 family picnics, take a leisurely trip along the river.
21 And resorts, such as this one in the Prescott area,
22 advertised boating, bathing, and so forth.

23 And this is Granite Dell, a little lake near
24 Granite Creek.

25 So we have boating used for a lot of

1 purposes. We have people just going sailing for fun.
2 Lake Dell, Lake Mary, Walnut Grove Lake before the dam
3 collapsed, and so forth. And this is a sort of
4 unexplained picture that I found in the Arizona Historical
5 Foundation. It says "Boating on the Salt River," and I
6 believe the date was 1914. Here we have so many lakes,
7 great fishing there, people went duck hunting. We saw
8 earlier they were fishing. Boats were pretty common as
9 far as I can tell. But they were not news, they were not
10 newsworthy. If someone went fishing in a boat, the
11 newspaper was not allowed to cover it. If somebody went
12 fishing in a boat and had a big disaster, they might get
13 in the newspaper. So when the unexperienced cede earlier
14 about the absence of evidence not being the evidence of
15 absence, is very true. People did things, accomplished
16 things, but unless they were exciting, out of the
17 ordinary, it just wasn't mentioned in the newspapers.

18 So here we have a -- I previously spoke to
19 one of the guys who traveled the Gila River from source to
20 the mouth in May 1891. And here we have somebody boating
21 Clear Creek up in northern Arizona. Boating technology
22 changed considerably around this time, or earlier. The
23 picture on the left is Powell's boat that he used for
24 exploring the Grand Canyon. He had his chair latched onto
25 the boat so that he could watch what was going on all the

1 way. His boats were not at all suited for Grand Canyon
2 travel, it's amazing that he got through. Quite a bit of
3 technology improved the boating along the river, they
4 tried hard wood and soft wood. They tried to close
5 changes, but one of the greatest innovations for the
6 Colorado River was turning the rower around. Ordinarily
7 when you row a boat, you're facing the wrong direction,
8 you can't see where you're going to. So this boat, as you
9 can see, has two seats. And when you're going down the
10 rapids, you can actually sit in that direction and watch
11 what you're doing as you go down rapids. But it wasn't
12 foolproof, and even here, they got stuck and some of them
13 crashed. This one is a little later period, but I wanted
14 to follow up on the inflatable boat story. This is from
15 the 1940s. This is the first inflatable boat that we know
16 of in Arizona -- this is the Verde River -- made up of
17 modern artificial rubber, which was developed during World
18 War II. Natural rubber did not turn out to be very useful
19 for inflatable boats in the conditions of being wet and
20 suddenly being very hot and dry. And artificial rubber
21 could easily get over these conditions. So here we have
22 this gentleman who's the first rafter on the Verde River
23 as far as we know. And it wasn't very long before modern
24 rafting technology developed, and we have trips like this
25 on the Salt River, the Verde, the Virgin, some other

1 rivers in Arizona.

2 We've had people who just made -- just went
3 out for the heck of it to see if they could do it. And
4 four years later, somebody else made the trip down the
5 Gila River. It doesn't say where he started, but he tried
6 that again and -- probably never did.

7 And finally, my favorite boating description
8 of all. In the State -- somebody mentioned earlier Jacob
9 Shibley -- the Phoenix newspapers were just as much fond
10 of making fun of people as was the editor of the Tribune.
11 So they followed Mr. Shibley building his gigantic boat
12 that could rival the Emperor Tojo. It was a funny-looking
13 boat and they made great fun of watching him go down the
14 river. He sends periodic reports, which they published
15 verbatim, until he grounded at Gila Bend. What I thought
16 was interesting was this. No one has any business on the
17 river with a boat less than 6 feet wide, 14 feet long, 6
18 feet high and 2 feet deep. So it was a gigantic boat that
19 would challenge the Emperor Tojo. He must have been
20 smaller than him.

21 And so we have, I think, evidence from lack
22 of evidence that actually there was a lot of boating going
23 on with a great variety of boats, from canoes to
24 canvas-covered boats to metal boats, scows, bigger boats
25 for crossing rivers. A lot of them knew it was happening,

1 but it just wasn't coming to them because it wasn't
2 newsworthy, it was routine.

3 So I believe that actually boating was
4 fairly common. People boated on canals, ponds, lakes,
5 wide boating on the rivers. We probably will never know,
6 and this is one of many really unknown questions that I'm
7 leaving you with. We just don't know. Can we conclude
8 that -- we don't know. We don't have specific examples of
9 people boating up and down the rivers, that it didn't
10 happen, and how can you use this kind of information.

11 So in conclusion, I would be happy to answer
12 any questions about the kinds of boats and how boats were
13 used in the area. Any questions?

14 (Ms. Tellman is answering questions.)

15 BY COMMISSIONER BRASHEAR:

16 Q. Aside from the Nellie Bush ferry, it seems like
17 that was a substantial prolonged commercial operation?

18 A. Right.

19 Q. Do you find anything elsewhere in Arizona that
20 would measure to that as being a successful commercial
21 operation?

22 A. Yes, the Yuma ferry was extremely successful, and
23 in fact, it is so successful that there was a great deal
24 of fighting over who was going to get to have the Yuma
25 traffic. And then the Nellie ferry was quite a prolonged

1 operation, and it only ended when Lake Mead actually --

2 Q. These were all on the Colorado?

3 A. Those were Colorado. Then we have whatever was
4 happening on the Gila River with Hunt -- I have no idea
5 anymore about Hunt's trip there and the kind of ferry that
6 was than what you see in that one photo. We have other
7 examples of the little Colorado. A couple of the
8 examples, none of them great big long-term commercial
9 operations.

10 Q. You did mention -- apparently didn't find that
11 there was any kind of a boat manufacturing industry here
12 or that there was a company that was building boats in the
13 desert. What you told us is most of them were built in
14 backyards, barns --

15 A. That is my impression. Or were ordered from the
16 catalog.

17 Q. Or ordered from a catalog.

18 A. Yeah. But then there were people like Godfrey
19 Sykes who definitely had a big boat building operation.
20 And when you talk -- when the newspaper is talking of
21 Jacob Shibley, they talk about building it in, quote, the
22 Phoenix boatyard. But again, you just can't take what you
23 read in those papers seriously because the Phoenix
24 boatyard may have been Shivley's backyard, so we just
25 don't have that kind of verification.

1 And I did look in the commercial directories
2 for about that period for Phoenix, and I didn't see
3 anybody listed as a boatmaker. But that doesn't mean that
4 there wasn't any. That they didn't do it as a sideline to
5 carpentry or some other thing.

6 CHAIRMAN EISENHOWER: Thank you, Ms.
7 Tellman.

8 MS. TELLMAN: And I'm submitting this
9 original report that I did in 1998. You already have
10 this, but I'm submitting it as a separate document.

11 COMMISSIONER BRASHEAR: One of the things
12 was the -- Ms. Tellman, Mr. McGinnis would like to ask you
13 a few questions.

14 (Ms. Tellman is answering questions.)

15 BY MR. MCGINNIS:

16 Q. Mark McGinnis on behalf of SRP. Just so I didn't
17 miss it, of all the pictures we looked at, the only one I
18 saw that was on the Gila River for sure was Governor Hunt.
19 Is that right?

20 A. Yes. There were no pictures of all those
21 workers, they just were verbal.

22 Q. Even though we had text about the Gila, the
23 picture was someplace else?

24 A. Yes. We don't have pictures.

25 Q. Okay. And you've done a pretty exhaustive study,

1 it sounds like, to look for pictures, and this is all you
2 found?

3 A. Except I didn't look in the Salt River Project
4 archives because I wasn't allowed to.

5 Q. Did you ask?

6 A. Yes.

7 Q. Okay. That's all I have.

8 CHAIRMAN EISENHOWER: Thank you very much.
9 Mr. Helm, if you have a passing comment, then we're going
10 to break for lunch after your comment.

11 (Mr. Fuller is answering questions.)

12 BY MR. HELM:

13 Q. I just have a question for John Fuller, maybe
14 one, maybe two. But now that the State's report is
15 finished, as the head of the report, I would like to ask
16 him -- I realize that the reports that you have done,
17 John, for the commission both on the Gila and all the
18 others don't express any opinion as to whether the report
19 has a conclusion on navigability. But you've been the
20 leader of the people who have done all the studies, you've
21 reviewed all the work that produced the report on the
22 Gila, correct?

23 A. That's correct.

24 Q. Have you formed an opinion regarding whether the
25 Gila is navigable?

1 A. And everybody up here is smiling because they
2 know that I try to avoid answering that question, John.
3 My role in preparing the report is to present factual
4 information. I'm just presenting information, and you
5 folks, it's your job to make that decision. And you're
6 asking me this question because you know that the case is
7 near and dear to your heart. That after these reports
8 were prepared the first time, I was retained as a
9 potential witness for the reach that is downstream of Salt
10 River, basically Painted Rock, and in that case, my
11 opinion was that the river was navigable.

12 Q. So you have an opinion yourself based on the
13 studies that you have done that -- what I'll call the
14 lower Gila below the confluence where the Salt is in
15 fact -- or was in fact navigable or susceptible to
16 navigation at the time of statehood?

17 A. Let me clarify. That is not the objective of the
18 these reports. The reports don't draw any conclusion, but
19 as I looked at the evidence, yes.

20 Q. That is your opinion and that's based on what we
21 call the Federal Standards for Navigation?

22 A. Yes.

23 MR. HELM: I don't have any other questions.

24 COMMISSION COUNSEL JENNINGS: Following up
25 on that question, can you define the specific area of the

1 river about which you were just testifying?

2 MR. FULLER: Yeah. The reach of the river
3 that I was involved with extended from the Salt River
4 confluence down to Painted Rock Dam.

5 MR. MCGINNIS: Can I ask a couple of
6 questions to follow up on that?

7 (Mr. Fuller is answering questions.)

8 BY MR. MCGINNIS:

9 Q. Mark McGinnis on behalf of SRP.

10 Did you testify that you had been retained
11 by somebody in the Gillespie Dam case?

12 A. Yes.

13 Q. Were you compensated for that?

14 A. Yes.

15 MR. MCGINNIS: Okay. That's all I have.

16 COMMISSIONER ECHEVERRIA: May I ask Mark
17 what relevance that has, whether or not he was
18 compensated?

19 MR. MCGINNIS: Well, I'll tell you what
20 relevance I think it is, and that is that we've been
21 10 years now with these folks being what we thought was a
22 relatively unbiased technical expert on behalf of the
23 commission, and now we know that he is actually working
24 for an advocate on one of the parties. I just wanted to
25 bring it up. Whether it has any relevance to you or not,

1 is up to you. On this particular watercourse.

2 MR. HELM: Could I point out that that has
3 relevance also to all of Mark's witnesses who were
4 compensated for an advocate.

5 MR. MCGINNIS: I think that's true, sure.
6 But what I thought is clear to testifying on behalf of the
7 party or maybe it wasn't.

8 COMMISSIONER ECHEVERRIA: I guess one of my
9 problems has always been with this body, when that
10 question is asked and someone is working for something
11 that is not the State or an educational entity, to ask if
12 they were compensated is asinine; of course they're
13 compensated. Are you compensated, Mark?

14 MR. MCGINNIS: Yes, I am.

15 COMMISSIONER ECHEVERRIA: Thank you.

16 MR. MCGINNIS: But it's clear that I'm here
17 as an advocate.

18 COMMISSIONER ECHEVERRIA: But the fact
19 you're compensated does not suggest to me that you are
20 biased personally, if you were biased professionally for
21 obvious reasons, but it doesn't mean that you're biased
22 professionally.

23 MR. MCGINNIS: And that's certainly -- and
24 it's your decision, not mine. It's my job to --

25 COMMISSIONER ECHEVERRIA: I understand that.

1 But as I say, when you guys ask this question, I don't
2 notice that any of us has Gookin on ourselves. I think
3 you can safely assume we can figure that out. And I'm
4 being facetious, I know, but that has a real owee personal
5 point with me because that has been asked with less than
6 civility, and --

7 MR. MCGINNIS: And I understand that. I was
8 president the last time and I remember your reaction. I
9 thought that was the point of your question before because
10 your concern was somebody asked about the amount of
11 compensation. I certainly wasn't going to ask that. I
12 just wanted to make clear that Mr. Fuller represented a
13 party -- or worked for a party other than the Land
14 Department, who is doing this sort of technical review.

15 COMMISSIONER ECHEVERRIA: Understood. I'm
16 with you now.

17 (Mr. Fuller is answering questions.)

18 BY MS. HERR-CADILLO:

19 Q. Joy Herr-Cadillo.

20 I just want to clarify. You just opined as
21 to a portion of the river, and I just want to be clear
22 that there isn't a inference to be drawn that you have
23 concluded that other than the part that you described as
24 navigable that you concluded as non-navigable, which is a
25 very unclear question, but do you understand what I'm

1 asking?

2 A. I have not issued an opinion of any form
3 regarding any other segment of the river one way or the
4 other. I think that's the question that you were asking.

5 Q. And you did a much better job of stating it.

6 A. I'd like to clarify, the reports were written
7 prior to my being retained, so the information in the
8 report that was done, that contract was completed. As far
9 as we knew, the process was over. The only work we've
10 done since that time was to just remove language from
11 the -- that related to the bill -- part of the bill that
12 was struck down. So we didn't change the technical
13 contents of any matter. And I think if you read the
14 report it's pretty clear it's an unbiased presentation of
15 the facts. Information that I'm sure, when you see the
16 post-memorandum hearings, the people will be studying the
17 report on either side. I think I could be criticized by
18 both sides, so I guess we're doing okay.

19 MS. HERR-CADILLO: Thank you.

20 CHAIRMAN EISENHOWER: Thank you, John,
21 appreciate it.

22 I think right now -- it's 12:30, let's take
23 an hour break for lunch and get everybody walked around,
24 get a little bite to eat. We will be back here at 1:30
25 ready to go.

1 (The lunch recess was taken.)

2 CHAIRMAN EISENHOWER: Ladies and gentlemen,
3 we're back in session, but first let me apologize. We had
4 a waiter that had difficulties today, so that's why we're
5 a little late. But on top of that we have so many
6 witnesses, particularly on the Gila River, that I hope you
7 will bring your evidence and do it quickly and politely,
8 but bring all your evidence that you have to bring in. I
9 would appreciate it and I think all the other people here
10 who want to testify will appreciate it too, because I do
11 have quite a stack of speakers who wish to talk about the
12 Gila River.

13 So with that, first witness on the top of my
14 pile here is Mr. Mark McGinnis.

15 MR. MCGINNIS: I'm not a witness.

16 MR. SPARKS: Could we swear this witness,
17 Your Honor?

18 MR. MCGINNIS: Mark McGinnis, Salt River
19 Project. We have two witnesses. I don't know where they
20 are in your stack. You want us to do ours now?

21 CHAIRMAN EISENHOWER: Yes.

22 MR. MCGINNIS: Dr. Littlefield and
23 Dr. Schumm.

24 CHAIRMAN EISENHOWER: Yes.

25 MR. MCGINNIS: My first witness is

1 Dr. Douglas Littlefield.

2 DR. LITTLEFIELD: Mr. Chairman, members of
3 the commission, good afternoon. As you know, I've
4 testified before you in the past, and in the interest of
5 brevity I'm not going to go through my qualifications
6 again. I just want to refer you to my testimony in
7 October, which describes some of those qualifications.
8 And also I want to point out that with regard to that
9 testimony, as well as this testimony on the Gila, and my
10 forthcoming testimony on the Verde, all three of those
11 reports have my curriculum vitae in the appendix so you
12 can refer to that for the details about my background.

13 Similarly, I'm not going to go through in
14 great detail the sources that I used in research -- those
15 are described in the introduction of these reports --
16 other than I want to say I've used a huge amount of
17 material in reaching the conclusions that I have in
18 archives from all over the country, including National
19 Archives, state archives, historical societies, government
20 reports, and so forth.

21 I did want to add a little bit of
22 information to clarify some of my earlier testimony about
23 surveying, particularly as a government -- general land
24 office surveyors particularly pertains to the Gila. The
25 surveys that relate -- the general land office original

1 surveys that relate to the Gila were undertaken over a
2 wide range of years. There has been some testimony about
3 those surveys here earlier. But just to deal with the
4 original surveys for the different townships along the
5 Gila had only those took place in 1868, 1871, 1874, 1877,
6 1878, 1882, 1883, 1890, 1910, and 1911. Those are the
7 prestatehood surveys.

8 There was also a resurvey done as part of
9 one of the townships that was done in 1907 and several of
10 the townships were surveyed after 1912, including one that
11 took place in late 1912, one in 1915, and one in 1936. As
12 I explained in my testimony with regard to the Salt, there
13 were a number of different survey manuals that governed
14 how surveyors were to undertake their work. And I want to
15 really stress here, these surveyors were charged
16 specifically with looking for evidence of navigability.
17 This was not a sideline or something that they threw in
18 there, but part of their specific instructions in each of
19 these manuals said specifically to address the question of
20 navigability. But I also want to make it clear, a couple
21 of things about the Gila. First of all, the vast majority
22 of the surveyors that undertook the surveys at those
23 different years, the overwhelming majority of them did no
24 meanders of the river at all. Meanders were what they
25 were to do if they deemed the river to be navigable.

1 There were, however, two instances where there were some
2 meanders done of the Gila River, and I specifically wanted
3 to address those here and now just to clarify what that
4 those meanders meant.

5 First of all, let me pull up Exhibit 3 here.

6 Actually, I want to back up one second and
7 cover a little bit about what I didn't do in my research
8 because that's always useful in terms of what I did and
9 didn't do.

10 First of all, I did not do historical
11 research in relation to Native Americans. My field of
12 expertise is not Native Americans and I felt others could
13 do that better, so my report doesn't cover that. Also, in
14 addition to the survey exhibits that I have here, I was
15 selective in what I chose on these large exhibits, but I
16 did, in fact, examine all the survey materials and all the
17 homestead patents for the entire reach of the Gila from
18 the Salt down to the Colorado. In relation to what I
19 didn't do, I did not examine any reach of Colorado -- I'm
20 sorry, of the Gila River above its confluence with the
21 Salt River, so I'm addressing any part of that portion of
22 the Gila.

23 Let me put one other exhibit up and then
24 I'll turn to what I wanted to say about Exhibit 3.

25 (An off-the-record discussion ensued.)

1 DR. LITTLEFIELD: This map illustrates the
2 reach of the Gila River that I looked at specifically with
3 regard to all of the surveys prestatehood and also the
4 homestead patent files. Because of the length of the
5 river, I felt that I really couldn't describe and discuss
6 every single patent and every single survey in my report
7 covering this reach of the river. But I do want to
8 emphasize, I did review every single set of field notes
9 and every single patent for the entire length of the
10 river. I simply didn't discuss them in my -- all of them
11 in my report. Nothing in what I did not discuss in my
12 report conflicts with what I am saying here, what's in my
13 report. As you can see, there were four sample areas on
14 the Gila River. Those were chosen primarily because they
15 tended to have a high level of original settlement and
16 therefore it made it easier to get a significant number of
17 patents for my discussion purposes. But again, nothing
18 that is outside the sample area conflicts with what's
19 inside the sample areas.

20 Now, going back to Exhibit 3, I was talking
21 about the small number of cases where there were meanders
22 along the Gila River. Exhibit 3 contains one of the
23 locations where there were, in fact, meanders. These were
24 meanders that were done by deputy surveyors Solomon
25 Foreman in 1871. He did the original surveys for township

1 5 south, range 4 west along the Gila River. And in that
2 particular instance, he did meander one bank of the Gila
3 River, not both banks, but one bank. And I don't have it
4 in my notes here, but my recollection is that he switched
5 from one bank to the other part way down. The reason why
6 he undertook that meander was not for navigability. The
7 surveyor, Mr. Korman, was operating under the 1864
8 surveyors' instruction manual, which had added a new
9 reason for doing meanders to the original survey
10 instructions, which were 1851 and then 1855.

11 The original 1851 and 1855 instructions only
12 said meander navigable bodies of water, it said nothing
13 about any other types of bodies of water to meander.
14 1864, though, that manual said, "Do meanders of one bank
15 of rivers" -- and I want to get the exact quote here. I
16 don't have the exact quote -- yes, I do. Just a moment
17 here.

18 Exact quote with that Mr. Foreman was
19 supposed to operate under -- is he was to meander one
20 bank, the right-hand bank, facing downstream of, quote,
21 rivers not embraced in the class nominated "navigable"
22 under the statute, which are well-defined in natural
23 arteries of internal communication and have a uniform
24 width.

25 And surveyors' -- Foreman did indicate that

1 he was following the instructions that he was given in his
2 surveying contract, and he did meander the one bank
3 because he deemed it to be a route of internal
4 communication, meaning something that people followed a
5 path along, such as the Gila Road.

6 There was one other instance where there
7 were historical meanders that were done, and that's in
8 Exhibit 5. A little further down the river. By the way,
9 the reason why there are Exhibits 1 through 5, are that
10 one of the exhibits is to be the overall overview map.
11 This is Exhibit 5 where the Gila River meets the Colorado
12 River. In this particular case, the surveyor involved was
13 James Martineau, that's M-a-r-t-i-n-e-a-u. And he
14 surveyed township 8 south, range 21 west and he did that
15 survey in 1890. He was operating under the 1890 surveyors
16 manual which had just been issued by the General Land
17 Office.

18 The 1890 manual contained all the original
19 instructions for surveying, meaning not-navigable bodies
20 of water, but it did add one new classification to
21 surveys, that was that he was to -- surveyors were also to
22 meander not-navigable bodies of water that were over three
23 chains in width. The reason for that was simply that part
24 of the purpose of these surveys was to identify lands to
25 homesteaders so they could go out and make a precise

1 location of where their lands were going to be. And
2 everyone knew that washes of rivers and the like were not
3 potentially good farm land, and therefore, the land office
4 didn't want to sell land in a block of land that was going
5 to be in something that couldn't be farmed.

6 So Mr. Martineau did, in fact, operate under
7 the 1890 manual. He did, in fact, meander both banks of
8 the river, but he also indicated that the reason why he
9 was doing that was because the Gila River in this
10 particular reach was over three chains in width, which was
11 the requirement of the surveying manual at the time.

12 I also wanted to point out one or two things
13 about where this information comes from in terms of
14 meanders and how one reads it. First of all, surveyors
15 took field notes when they were actually in the field and
16 they did them in small little notebooks. They were
17 handwritten. And surveyors then took them back to an
18 office or some other location and they then drew the plats
19 from which these surveys were -- from their field notes.
20 I have an example of the plat which is actually on the
21 Verde River, but as an example, would work just as well
22 for both the Gila and the Verde for the purposes that I'm
23 talking about here.

24 The meanders that were done either for
25 navigability on any river -- if a river was meandered the

1 actual details of the survey's degree bearings and the
2 lengths that were walked on particular lines for the
3 meanders were recorded in the actual field notes, these
4 notebooks that I mentioned. But they were also reported
5 on the plats that were drawn from the field notes.

6 And as I said earlier, this is a sample from
7 the Verde that I brought for my Verde testimony, but it
8 would work just as well for the Gila. On the left-hand
9 side, you can see that there's a block that's printed on
10 the standardized form for the plat, and the block is
11 labeled "meanders up" and it then gives a place for the
12 surveyors to enter the meander post number where they put
13 them in, the course that they had at the degree bearing,
14 and then the length. And all those details were to go on
15 the plat in addition to their field notes.

16 In any event, as I indicated, Mr. Solomon
17 Foreman did one-bank meanders under the 1864 manual and
18 then James Martineau did the meanders as well on both
19 banks under the 1890 manual. It's important to stress
20 here that with those two exceptions, none of the other
21 surveyors did any meanders at all and they were
22 specifically charge with looking at navigability.

23 The other thing that I mentioned in my
24 previous testimony on the Salt as well and will be
25 bringing up again are the homesteads. Homestead

1 applications. And in those particular cases, as I said
2 moments ago, there were well over 100 patents that were
3 issued all along the Gila River. And in those cases where
4 those patents contained the bed of the river, there was
5 never any indication in any of those patents or their
6 accompanying files that included their applications,
7 testimony of witnesses, correspondence if there were any
8 disputes. There was never any indication that anyone
9 thought the river was navigable by withholding the land or
10 for any other reason.

11 I also wanted to mention some of the other
12 historical documents such as government reports that deal
13 with the question of navigability. We were talking
14 about -- some of the other testimony came up regarding
15 government reports, and I do have some selections here
16 from various government reports about what the -- how they
17 described the Gila before statehood.

18 The 1891 annual report from the U.S.
19 Geological Survey described the river in the following
20 way: The floods of the Gila are usually short and
21 violent. The highest water occurring during the month of
22 January and February. During a fresh flood the river
23 rises in some places from 8 to 12 feet and increases in
24 width from 300 feet to a mile and a half. It is sometimes
25 impassable weeks and has the appearance in places of a sea

1 of muddy water. The season of low water occurs during the
2 month of June and July, the river bed being then dry in
3 places.

4 Another example comes from the report of
5 progress of stream measurements for the calendar year
6 1905, part 11, Colorado River drainage above Yuma, but
7 this particular description is of the Gila. "The river
8 now," meaning 1905, "flows in a channel fully one mile
9 north of the original channel. At every flood, the
10 channel shifts. The valley at its narrowest is half a
11 mile wide and the waters may occupy any part or all of
12 it." He also adds that the river, quote, contains, quote,
13 an enormous amount of mud and sand. At times the waves of
14 sand traveling along the river of the stream were so
15 large, the current is so swift, and the stream so shallow,
16 the water is broken into a uniform succession of waves
17 two feet high or over. And that's in contrast to the
18 previous testimony that said in places the river was dry.
19 So there's a clearly major change in the amount of flow of
20 water.

21 A U.S. Geological water supply paper
22 published in 1910 called the river torrential, and that's
23 their word, and the reporter described the Gila as, quote,
24 sometimes impassable for weeks and it has the appearance
25 of muddy water. And then the water -- that same paper

1 added that in the season of low water, in June and July,
2 the river bed then being dry in places.

3 Another report was written by an engineer by
4 the name of Murphy. Mr. Murphy was sent out in 1915
5 specifically to look for hydroelectric power dam sites,
6 because under the Enabling Act of 1910, Arizona could not
7 select for its state lands, lands that were suitable for
8 the development of hydroelectric power. Murphy was
9 actually in the field identifying those lands on behalf of
10 the U.S. so that the State could not select those lands.
11 But Mr. Murphy's report does contain some good descriptive
12 material about the Gila River. Murphy said that, quote --
13 I'm sorry, the Gila, quote, flows through a broad flat
14 valley in a broad, sandy changing channel. It is dry for
15 a month or longer each year at Florence and below Gila
16 Bend it is dry all the time except during large and
17 long-continued floods.

18 There are many ditches diverting water from
19 Gila in this part, and the area that can be irrigated from
20 them is very large, but the area actually irrigated is
21 comparatively small on a kind of small and uncertain
22 supply. As previously stated, there may be several years
23 in succession of very small runoff. These years only
24 ground water -- I'm sorry, during these years, only ground
25 water is available for some of this land. The irrigation

1 ditches, and especially the headworks, are allowed to get
2 out of repair. And when a flood comes, it damages or
3 destroys the headworks and little, if any, of the flood
4 water is utilized. At some places on the Gila Indian
5 Reservation, the underflow comes to the surface and is
6 diverted for irrigation. Also below the mouth of the Salt
7 River where the Buckeye and Arlington canals are located.
8 The canals and the ditches that tap the underflow have a
9 permanent supply, but those that depend on the surface
10 flow are not a success.

11 And I also won't put it into the record
12 because it has already been put in, but my report also
13 included some direct quotations from Mr. Cooke on the
14 Cooke expedition in 1846. The direct quote of where
15 Mr. Cooke stated that the trip was a failure is quoted in
16 my report of page 106. Also the Emory expedition. I
17 don't believe that one was discussed. There's also a
18 direct quote about the nature of the Gila River in 1846 to
19 1847 on pages 108 and 109.

20 And I guess that's all that I have for
21 today. If you have any questions, I would be glad to
22 answer them.

23 CHAIRMAN EISENHOWER: Commission Brashear?

24 (Dr. Littlefield is answering questions.)

25 BY COMMISSIONER BRASHEAR:

1 Q. There has been mention many times that you have
2 these surveyors here operating according to the very
3 specific manual.

4 A. That's correct.

5 Q. But I'm wondering, if you dig a little bit
6 deeper, if these people were operating in an environment
7 that was not unlike Iraq today. I mean, especially the
8 early ones. If Geronimo had not surrendered, it was very
9 dangerous out here, very lonely, and I'm wondering how
10 much can we depend that some guy came out here from
11 graduate school, picked up some kind of credentials as an
12 engineer and came out here, took that manual, and said,
13 "By god, we're going to take this thing every step of the
14 way." That he didn't say, "I don't care. Put the stake
15 there. It's not going to ever make any difference to
16 anybody." So I would just like to --

17 A. Your question speaks to the accuracy of the
18 survey and I think it's a good question.

19 I would respond to it in a couple of ways.
20 One, there was unquestionably fraud involved some of the
21 surveys, not just in Arizona but throughout the west. And
22 in fact, in some of the cases, there were resurveys for
23 precisely that reason.

24 But I think it's also telling that the
25 surveyors that were involved in, for example, the Gila and

1 the Salt River on the upper Salt -- I testified about
2 Theodore White, he did all the surveys up there --
3 Martineau and Solomon Foreman did -- I can't remember the
4 names of the other ones -- but there were only eight or
5 nine surveyors total on the lower -- the Gila between the
6 Salt River and the confluence with the Colorado. And I
7 think, given the reliance on these particular surveyors
8 who have done as many of the surveys as they did, to me is
9 testimony that what they did is fairly accurate. But your
10 point is absolutely correct that in some cases they didn't
11 do surveys because of Indian attacks. Although, in the
12 contract files, which I have been through for the
13 surveyors, there will be correspondence to that effect,
14 sometimes that they couldn't complete the job because of
15 the Indians.

16 And as I noted with the surveyor Theodore
17 White, they were honest when they couldn't survey certain
18 areas, that it was just too difficult. So I personally,
19 as a historian, I'm satisfied about the accuracy of the
20 surveys on the Gila, and for that matter, the Upper Salt
21 that I testified about and also about the Verde.

22 Q. Are you more confident of the layer that came --
23 does that increase confidence? Like, as you mentioned,
24 some of them go back as far as 1881. Some go into 1906,
25 1907. I was just wondering, in that period of time there

1 was a lot taming going on out here, and I wondered if
2 there was any reason to believe that the later ones were
3 more accurate than the earlier ones?

4 A. With regard to the dates on the surveys, some of
5 the early ones on the Gila took place in the late 1860s,
6 and then they continued depending on where you were on the
7 river up until -- the bulk of them were done by the time
8 of statehood, but there were a few after statehood.

9 With regard to accuracy over time, what I
10 found is that the surveyors tended to be told to do more
11 detail, not less, as time went on. Their manuals were
12 more, for example, required them to do smaller sections
13 within the original townships, like quarter sections and
14 so forth. And the manuals became more precise over time
15 to correct problems that had arisen with regard to, for
16 example, meanders. Part of the provision of that 1890
17 discussion about the three chains and water, the
18 instructions in the manual said that part of the reason
19 why they were putting in there was that there had been
20 some dispute over the use of meandering with regard to
21 surveying the boundaries of Indian reservations, and they
22 were trying to clarify that by the instruction that they
23 were putting in there.

24 Q. Now, were these -- if my history is right, some
25 of these surveyors were military personnel in Arizona and

1 the others were government employees, or were they
2 contract employees, or who were -- who did these people
3 work for?

4 A. I don't know the exact backgrounds on all the
5 surveyors. The ones that I have run across were all
6 contract employees, hired in the contracts. Their
7 contract files that I've been through are at the National
8 Archives. Those contract files typically will say, "You
9 will follow the instructions" -- this is the surveyor
10 general speaking -- "in the manual of such and such a
11 date," and if there is anything else unusual that they
12 were to do, they would do as well.

13 There would also sometimes be correspondence
14 from the surveyors saying why he couldn't carry out the
15 instructions that he was asked to do, if that was the
16 case. But all the surveyors that I have run across in
17 Arizona were all contract workers working through a
18 contract with the U.S. government.

19 Q. Was there any kind of a compliance check that was
20 done at the end of one of these contracts or to make sure
21 that the contract had been lived up to by the contractor?

22 A. The surveyor didn't operate by himself. He
23 typically had a work crew with him and then the work crew
24 would sign off under penalty of perjury along with
25 surveyor that they had done the job accurately. But there

1 were resurveys that were done, notably in 1907 along the
2 Gila, although I don't remember precisely why that one was
3 done.

4 COMMISSIONER BRASHEAR: Okay. Thank you.

5 CHAIRMAN EISENHOWER: I have no questions.

6 Is there anybody in the audience that would
7 like to ask Dr. Littlefield -- Laurie, please come
8 forward.

9 Again, I ask everybody -- not just you this
10 time -- everybody, as you come up, make sure that it's
11 brief, to the point, and relevant, because we have so much
12 to get through and so many speakers.

13 (Dr. Littlefield is answering questions.)

14 BY MS. HACHTEL:

15 Q. Laurie Hachtel from the Attorney General's for
16 the State Land Department. I just have a few questions
17 for you, Dr. Littlefield.

18 My first question is, in the first year of
19 research, did you examine the GLO contracts?

20 A. Yes, I did.

21 Q. And in the GLO contracts, did they have specific
22 instructions to the surveyors as far as whether they would
23 consider the river navigable or non-navigable?

24 A. Generally, the contracts that I have seen say to
25 the surveyor, "You," meaning the surveyor, "will follow

1 the instructions that are outlined in" -- in some cases,
2 they state the specific title of the manual then in force
3 or in another cases it says, "You will follow the
4 instructions under the published rules of the land
5 office."

6 Q. And your earlier testimony on the Upper Salt,
7 just to clarify, I thought you had said -- and I would
8 like you to confirm this for me if it's accurate -- that
9 the courts are not bound to base navigability decisions on
10 whether the GLO surveyors meandered a river or not. Is
11 that correct?

12 A. I don't believe I testified about that. You may
13 have gotten it from someone else, but I don't think it was
14 from my testimony.

15 Q. Well, then, is it your opinion that a meandered
16 delineation by a GLO or BLM surveyor is definitive for
17 navigability?

18 A. They are what they say there are. It's the
19 surveyor's opinion as to the date of the surveyor that in
20 his view the river either was or wasn't navigable.

21 Q. But you don't have an opinion based on -- I mean,
22 if they determined that it is or is not navigable, you
23 base your opinion on that as far as for non-navigability
24 of the Gila?

25 A. It's one of many sources that I considered. And

1 in relation to all the other sources put together, that
2 leads me to my general conclusion. But in and of itself,
3 I would only consider that if I felt, as the Land
4 Department mentioned this morning, what tends to validate
5 their sources by looking at whether they are supported or
6 disputed by other sources. And in relation to the
7 surveyors, pretty much all the other sources agreed with
8 what those surveyors had found.

9 Q. Just a few more questions, Dr. Littlefield.

10 Dr. Littlefield, wouldn't you agree that
11 diversions and canals in existence at statehood altered
12 the conditions, particularly the flow, of the Gila?

13 A. Yes, they did.

14 Q. And wouldn't you agree that by statehood,
15 virtually all the flow had been impacted -- or I should
16 say, had been diverted?

17 A. I don't know what the numbers are on that.
18 They -- the diversions, unquestionably, had an impact on
19 the flow.

20 Q. And do you know what the term "ordinary and
21 natural" means in the context of navigability --
22 determining navigability?

23 A. Only in the general sense. I'm not an attorney,
24 and I haven't gotten any detail on that.

25 Q. In the general sense, can you explain to me what

1 you think it means?

2 A. I think the land department described it this
3 morning -- maybe it wasn't the land department -- but
4 meaning, sort of, the average of what the average flow
5 would be, not the extremes of the flow or the extremes of
6 drought.

7 Q. And Dr. Littlefield, your report doesn't assess
8 or consider the river in its ordinary and natural
9 conditions without diversions or man-made obstructions,
10 does it?

11 A. Some of the surveys, I believe the earlier ones,
12 were done before most of the diversions were put on the
13 river. But my report, as a accumulative document, does
14 not deal with what might be called the natural flow of the
15 river without any impact by humans.

16 Q. And those surveys would then -- which ones in
17 particular, the 1868 survey and the 1871 survey up to --
18 what surveys would you include in that?

19 A. As was testified to this morning, as you get
20 later in time, there are more diversions, and I don't know
21 the precise flows of which diversions took additional
22 waters out of the river, when and how that would have made
23 it -- a certain percentage less natural. All I know is
24 that the later in time you go, the more of the river was
25 appropriated and diverted.

1 Q. And Dr. Littlefield, isn't the surveyor's meander
2 line simply his opinion on the day he viewed that
3 particular river? Isn't that true?

4 A. Yes, the day that he was there.

5 Q. So it doesn't -- that in and of itself, on that
6 particular snapshot of the river, does not necessarily,
7 would you agree, prove conclusively navigability of the
8 river in general?

9 A. No. But when taken in consideration of the fact
10 that -- I believe it was nine separate surveyors being
11 there in separate years and separate times of years all
12 reached the same conclusion that many, many other --
13 literally hundreds of parties reached, either implicitly
14 or explicitly, the river was not navigable. I think it's
15 pretty persuasive that the river was not navigable.

16 Q. But it doesn't conclusively prove it though?

17 A. One particular document, no, it does not.

18 Q. And Dr. Littlefield, did you check to determine
19 if any of the surveyors of the Gila were given special
20 instructions for their surveys?

21 A. I went through their contract files, and I don't
22 remember the specifics, but there was nothing unusual in
23 them that I recall.

24 Q. And if they were given special instructions in
25 particular, they would have been in contract files?

1 A. Not all the contract files could be located, so I
2 don't know the details on all of them. But sometimes
3 there were special instructions and sometimes there were
4 not.

5 Q. And those would have been included in the report?

6 A. Sometimes, yes.

7 Q. And your conclusions about what manual a surveyor
8 was working under, aren't those simply assumptions because
9 you don't have records that establish exactly which manual
10 that particular surveyor was operating under, do you?

11 A. Not in every case. In some cases, the contract
12 files say explicitly, "You will follow the instructions as
13 laid out in the such and such manual," and it gives the
14 title of the manual. In others it just says generically,
15 "You will follow the published instructions now in force,"
16 or something to that wording. And in some of the others
17 it says, "You will follow the legal instructions of the
18 general land office." It was just sort of a mixed bag as
19 to what the particular instructions were.

20 Q. We know what the instructions were, but as far as
21 what the -- if surveyor actually followed that particular
22 manual, we don't know. Let's say, if he didn't have a
23 particular -- that copy never was sent to him, the updated
24 one from, let's say -- I can't of the one -- any of the
25 different ones if there was an update. We don't know

1 particularly for a fact that that surveyor had that in his
2 hands and actually followed that manual when he did the
3 survey?

4 A. I think you're correct in that regard. I think I
5 testified about Theodore White in regard to upper Salt.
6 His survey was done in 1880. I believe it was done
7 sometime in the middle of the year. I don't remember
8 exactly, but there was a manual that came out in 1880, and
9 there was no indication about whether he was following the
10 new 1880 manual or working under the previous one, which
11 is the 1864 manual, I believe it was. I think the further
12 apart the survey work was done from the date of the
13 published manual, more likely it is that they were using
14 whatever the current manual was. But your general point
15 is correct.

16 MS. HACHTEL: That is all the questions that
17 I have. Thank you, Dr. Littlefield.

18 CHAIRMAN EISENHOWER: Thank you, Laurie.

19 Is there anybody else that has a question
20 for Dr. Littlefield?

21 (Dr. Littlefield is answering questions.)

22 BY MS. HERR-CARDILLO:

23 Q. Dr. Littlefield, my name is Joy Herr-Cardillo.
24 I'm with the Arizona Center for Law in the Public
25 Interest, and we're here to represent Defenders of

1 Wildlife in this proceeding.

2 Could you clarify for me, when you use the
3 term "navigable" in the context of your study, what the
4 definition of that term is?

5 A. My personal definition?

6 Q. The one -- yes, what your understanding of the
7 term is as you used it here in this hearing and in your
8 study.

9 A. What I tried to do with my report is I tried to
10 examine the widest range of documents possible that would
11 shed some light on whether the river was considered
12 navigable under any definition. And that would be the
13 Daniel Ball case, which I didn't bring any documents
14 precisely related to Daniel Ball, or whether it would be
15 under any other type of precise definition or just a
16 general commonsense definition.

17 But I felt that looking at hundreds and
18 hundreds of documents would shed some light on whether any
19 of the parties thought the river was navigable, and if so,
20 to what degree. And I what I found was that pretty much
21 under any reasonable standard of assessment by parties who
22 were on the scene at the time, the river was not reliable
23 as a progressive means of transportation.

24 Q. Are you familiar with the Defenders of Wildlife
25 versus Hull decision?

1 A. I've only heard the case -- the title. I don't
2 know anything about the decision.

3 MS. HERR-CARDILLO: I have nothing further.

4 CHAIRMAN EISENHOWER: Thank you.

5 Any other questions for Dr. Littlefield?

6 (Dr. Littlefield is answering questions.)

7 MR. HELM: Mr. Chairman, John Helm for
8 Maricopa County.

9 We have a very extensive cross-examination
10 of Mr. Littlefield. I know that you have been admonishing
11 everybody to keep it short.

12 CHAIRMAN EISENHOWER: Is it relevant?

13 MR. HELM: We think it is, or we wouldn't
14 have done it. We're not here to waste anybody's time,
15 Mr. Chairman, but we do have an extensive
16 cross-examination. Part of that comes from the fact that
17 Mr. Littlefield -- or Dr. Littlefield just filed a whole
18 new report. We've had it since yesterday morning from
19 your offices. So we haven't had an awful lot of time to
20 go through it. We have obviously had no time to refer to
21 our experts for their review to supplement the record.

22 We have gone through it. We have devised
23 questions. We have divided that process up. Mrs. Livesay
24 from my office has worked on the portions regarding the
25 survey. I have taken the rest of that report. In

1 microphone and give us your name and who you represent.

2 MR. KNIGHT: My name is Jerry Knight. I'm a
3 retired BLM surveyor. I don't represent anybody. I'm
4 just a surveyor that would like to know where the boundary
5 is so I know where to survey.

6 But I have one question from the BLM manual
7 that I would like to ask Dr. Littlefield, that's section
8 7-49 and just clarify one thing, I think. I don't know if
9 he cited extensively from the manual, but the way I use
10 this is as my textbook in the class I teach at the Phoenix
11 College on surveying.

12 7-49 says, "The legal question of
13 navigability is determined by the facts in any particular
14 case and not from the action on the part of the surveyor."
15 And it cites the case -- U.S. Supreme Court case --
16 Oklahoma versus Texas, 258 U.S. 574, and then it quotes
17 that case. Just a short sentence here. "A legal
18 inference of navigability does not arise from the action
19 of surveyors in running meander lines along the banks of
20 rivers."

21 And I just wanted to bring that one
22 clarification. I don't think he's really saying that. He
23 says the way that the surveyors are thinking. But I did
24 want to point out that the manual does say and quotes the
25 court cases that we surveyors don't have authority to

1 determine navigation and anybody that says that is
2 contrary to law. And I don't know if you all have a copy
3 of the manual. I would be happy to donate one to you.

4 DR. LITTLEFIELD: Did you have a question?

5 MR. KNIGHT: I was going to ask you if you
6 were aware of that sentence in the manual.

7 DR. LITTLEFIELD: The manuals that I worked
8 with were the historical ones, not the current manual.
9 And you're correct that the surveyors were not precisely
10 given the responsibility to determine navigability. Their
11 instructions said that they were to meander bodies of
12 water that were navigable, and I believe the wording in
13 the manuals were "under the statutes." And so they made
14 judgments about what they thought might be navigable, but
15 it was their particular -- whether they meandered it or
16 not was not the final say in the matter. They were just
17 using their own opinions.

18 MR. KNIGHT: That's correct.

19 COMMISSION COUNSEL JENNINGS: Mr. Chairman?

20 CHAIRMAN EISENHOWER: Yes?

21 COMMISSION COUNSEL JENNINGS: Doesn't -- in
22 Oklahoma versus Texas, though, go on to say that while it
23 is not a inference or determining factor, it is evidence
24 that can be used in determining and considered by the
25 Court as to whether or not a stream or watercourse is, in

1 fact, navigable?

2 MR. KNIGHT: I have the case right here. I
3 could quote the case, if you would like me to, sir.

4 COMMISSION COUNSEL JENNINGS: Well, I'm just
5 asking. That was my recollection of what the case said,
6 that it while it's -- you're right, I agree it is not
7 mandatory, but it is evidence that can be considered.

8 MR. KNIGHT: I think that you can always use
9 evidence, and that's why I say that it was indicative of
10 the thinking at the time is what he's saying. But I did
11 want to make clear that just because we surveyors do it,
12 it doesn't really, according to the Supreme Court, have
13 any inference of navigability, it's just an opinion at the
14 time. And in the totality, Dr. Littlefield is correct
15 that there is a whole lot of inference that the surveyors
16 at the time considered navigable -- non-navigable, and I
17 agree with that thought. And it can be as part of the
18 whole factors, like Dr. Littlefield said, it can be
19 considered, but to say that just because a surveyor
20 meandered, that doesn't have anything to do with whether
21 it's navigable or non-navigable because the surveyor -- we
22 just don't have that authority to determine that.

23 CHAIRMAN EISENHOWER: Okay.

24 DR. LITTLEFIELD: Can I add one thing to
25 that? I agree with everything that you said. I did want

1 to stress that of all the history parties out here,
2 surveyors were the only ones that I ran across who were
3 told precisely that they were to, as part of their job,
4 they were to consider navigability in doing what they were
5 doing.

6 MR. KNIGHT: Thank you.

7 CHAIRMAN EISENHOWER: Thank you, sir.

8 MS. COPELAND: Mr. Commissioner, we actually
9 have a proposal that might help us out timewise I'm
10 betting you'll want to hear.

11 CHAIRMAN EISENHOWER: Would you state your
12 name again?

13 MS. COPELAND: Kirsten Copeland for Buckeye
14 Irrigation Company and Buckeye Water and Conservation
15 Drainage District. We also have historian Jack August
16 who's here to testify, and we were thinking that it might
17 be appropriate to go ahead and get both the historians
18 taken care of and let Mr. Helm have at them at once as
19 opposed to putting on one after the other. Is that --

20 MR. MCGINNIS: Mark McGinnis on behalf of
21 SRP. I don't object to Mr. Helm taking a reasonable
22 amount of time, whatever it is, to cross-examine
23 Dr. Littlefield. I was just wondering, if there are other
24 people here that want to testify, you might not want to
25 stay here until whatever time we get done with that to

1 testify. So it's fine with me if we want to put off
2 Dr. Littlefield's cross until after you do some other
3 witness, because Mr. Helm says he has two or three hours
4 to put in, and I'm assuming the rest of the people in
5 audience might not want to sit here for two or
6 three hours.

7 CHAIRMAN EISENHOWER: Why don't we do that
8 then?

9 MR. HELM: I'm not interested in that part
10 of the proposal that Buckeye Irrigation District does
11 because this stuff is fairly adequate to go into a
12 courtroom, and I don't want these witnesses to be confused
13 in the transcript about their answers. I would rather
14 have them testify separately.

15 MR. MCGINNIS: I think that's what we're
16 proposing.

17 MR. HELM: You can do it one at a time, is
18 all I'm saying.

19 CHAIRMAN EISENHOWER: I think the proposal
20 was -- as I understood it, was we'll delay
21 Dr. Littlefield's examination by you until a later time
22 and get these other witnesses done and over with.

23 MR. HELM: I thought Buckeye's proposal was
24 that we put them all up here, let them all answer, and I
25 get them all at the same time. I want to have an orderly

1 process. I don't want to go and do that.

2 MS. COPELAND: Sorry, Mr. Chairman, my
3 proposal -- and if anybody wants to leap on board, that's
4 certainly fine with me -- but we only have the one witness
5 so there's not a long line for Buckeye. But because they
6 are both historians, I thought it made sense in the
7 context to go ahead and get both of their testimonies on
8 the record and whatever Mr. Helm wants to do, that's fine.

9 MR. HELM: As long as it's done separately,
10 I don't have a problem.

11 MS. COPELAND: Separately, of course.

12 CHAIRMAN EISENHOWER: Okay.

13 MR. MCGINNIS: Like pull them back.

14 MR. HELM: Bring Buckeye up, I have no
15 problem with that.

16 MR. MCGINNIS: That's okay. We'll just
17 do -- what are we thinking about in terms of how late
18 we're going to do today, I guess would be the next
19 question. I don't have a problem, if you guys are willing
20 to do it, finishing the rest of it and then we'll stay
21 with Dr. Littlefield as long as you can stand it and get
22 that done; that way other people can go on and people who
23 aren't interested can listen to cross.

24 CHAIRMAN EISENHOWER: From what I see on my
25 speaker list, most of the people are interested in the

1 Gila River. Have very little interest in the Verde right
2 now. That may change, but right now I don't. So I would
3 rather get as much of the Gila River out of the way. And
4 if Mr. Helm is planning on two hours, I mean, that seems,
5 to me, a long time.

6 MR. HELM: I took over two days taking his
7 deposition, Mr. Chairman. It's not a long time, there's a
8 condensation.

9 CHAIRMAN EISENHOWER: Well, let's -- okay --

10 EXECUTIVE DIRECTOR MEHNERT: Mr. Chairman,
11 we can have the room as late as we want and we can have it
12 as early as we want tomorrow.

13 CHAIRMAN EISENHOWER: What we'll do is we
14 will defer Dr. Littlefield for this time and hold him off
15 until a little bit later time. Thanks.

16 And we'll go ahead with your historian.

17 MS. COPELAND: Well, you all know him
18 anyway, this is Dr. Jack August. And I'll just let him go
19 ahead and take care of all the preliminaries, except just
20 to -- copies of his report are right here, more than you
21 could ever want to have, I'm sure.

22 And also just to get clear on the record,
23 you're being paid, right, Jack?

24 DR. AUGUST: I'm being paid.

25 MS. COPELAND: On time?

1 DR. AUGUST: On time and --

2 CHAIRMAN EISENHOWER: Everybody in the room
3 is except us, but that's fine.

4 (An off-the-record discussion ensued.)

5 DR. AUGUST: I know most of you have
6 appeared before this commission before.

7 MR. WOODFORD: Just for the record, my name
8 is Brad Woodford with the law firm of Moyes Storey. And
9 Jack August is also the historian for Paloma Irrigation
10 Drainage and District. I just wanted that to be known for
11 the record, not just for Buckeye.

12 CHAIRMAN EISENHOWER: Thank you.

13 MS. COPELAND: And I apologize, that was my
14 fault for not bringing my notes up here.

15 DR. AUGUST: All right. In order to try to
16 move this forward, you have what is 36, 40 pages of
17 narrative, and what I want to do is -- I know that the
18 heart of Dr. Littlefield's testimony chronologically runs
19 from roughly 1848 to 1912 and a little bit beyond, of
20 course. I want to kind of bracket his information. For
21 the most part, there's a significant degree of continuity
22 with his extensive report, both the previous version and
23 current version that has just been handed in. There is
24 very little change in terms of the erratic or kind of
25 intermittent nature of the Gila River. I also want to

1 stress that what I am going to do for the first five
2 minutes here is stress that this is -- I'm going to talk
3 about material prior to 1848, before dams, the natural
4 flow of the river. And then I thought I'd end with kind
5 of just adding a little bit about some of the diaries,
6 monographs, contemporary accounts, newspapers, and other
7 accounts that may just elaborate upon the nature of the
8 river to statehood.

9 I'll try not just to read from the
10 narrative, but I do want to start with this, that on
11 June 10th of 1913, just shortly after statehood, Howard S.
12 Reed who was an employee of the -- then -- called the U.S.
13 Reclamation Service -- responded to an inquiry from fellow
14 worker Lewis C. Hill about stream flow in the Gila and
15 southwestern Maricopa County. And I quote, Mr. Reed said,
16 "On the 10th of August 1911, I made current meter
17 measurement. The original notes which are here with it
18 closed when I found a discharge of 103 feet per cubic
19 second and this with no flow at all below Buckeye dam."
20 And again, my report is geared toward Buckeye and Paloma,
21 but it's placed in the broader context of our hearings
22 here.

23 In fact, one could walk across the river and
24 hardly dampen the shoes. I think this vivid depiction of
25 a meager, almost ephemeral stream in many ways

1 encapsulates what contemporaries described as an
2 unpredictable -- undependable and unpredictable
3 watercourse that over time flowed intermittently and
4 infrequently during the early decades of the 20th century.
5 Again, I pertain similarly to Dr. Littlefield, and I think
6 we are -- our historical methodology -- I think mine
7 mirrored his in terms of what we looked at. He had much
8 more extensive time in the field looking at surveyor's
9 notes and all of that. But I basically would affirm that
10 his finding of his report and as I -- I think I quote at
11 the end of this opening paragraph, the Gila River was
12 highly erratic, subject to flooding and major channel
13 changes, blocked by obstacle, both natural and man-made,
14 and diverted for irrigation needs. In short, the Gila
15 River was not navigable on February 14th, 1912. And
16 again, I refer to the various attempts to describe legally
17 and impressionistically, I guess, as to what was navigable
18 or not navigable as I've heard here today and in previous
19 hearings.

20 Now, if the areas -- I'm going to forego any
21 analysis that I did here of Native American issues
22 pertaining to navigability or non-navigability of the
23 river. But I do want to talk about the Spanish and
24 Mexican periods in order just to add something -- to
25 elaborate on Dr. Littlefield's report and others in the

1 statements, the land commissioner's as well.

2 Spanish priests, soldiers, civilian
3 explorers, in the 17th and 18th centuries took note of the
4 inhospitable environment, the inadequate water supplies of
5 the lower Gila River system. And with few major
6 exceptions, according to the distinguished historian
7 Michael Meyer, from down at the U of A -- he's done some
8 pioneering work. His book "Water in the Hispanic
9 Southwest: A Social and Legal History, 1550 to 1850" I
10 recommend to everyone in this room, historians or not. I
11 quote from that -- he says, "The water sources, the Rio
12 Grande, the Colorado, Huarte, the Yaqui, the Gila, being
13 the most notable, which the Spanish dignified with the
14 word "Rio" were scarcely rivers at all. Not even the
15 largest, the Rio Grande, proved valuable for
16 transportation and commerce either before or after the
17 Spanish conquest. Although scientific evidence suggests
18 forcefully that they carried a larger flow than they do
19 now. That's obvious. Most rivers were not perennial.
20 They ran only part of the year, trying their best to carry
21 the excess of a sudden summer rain or capturing the excess
22 of an exceptional winter snow cover and the surrounding
23 mountains." Unquote.

24 The more common pattern, according to
25 Dr. Meyer, was for the water to sink quickly into the

1 sandy bed and within a short distance, disappear from
2 human sight. On occasion, however, they ran partly on the
3 surface, and in fact, we found out at the Santa Cruz
4 hearings that underground, protected from the evaporative
5 powers of the environment, to be forced to the surface
6 again by the geological structure of a given area.

7 To move forward, these rivers like the Gila
8 did not always carry sufficient water. They nevertheless
9 proved basically attractive, drawing the surrounding
10 animal life, providing moderate moisture required for
11 desert flora. It was along rivers like the Gila, arroyos
12 and quicksand streams that most Indian populations, like
13 the departed at Hohokam, adapted to desert life.

14 The alluvial plains, ranging in width from a
15 few feet to several miles, were rich and an unreliable
16 source of water. Here too, Spanish towns, missions, and
17 presidios would claim to a precarious existence. And I
18 would argue also that as these two groups, the Spaniards
19 and the Indians, were forced by physical and historical
20 circumstance to increasingly closer contact, precious
21 water soon became -- came to dominate the very contest for
22 power and survival among these two groups in the 17th to
23 19th centuries.

24 Now, to get more specific even for the time
25 of Father Kino and his extension of the river Christian in

1 the lower Santa Cruz and Gila valley in the 1690s. The
2 Gila River played a prominent role as a transportation
3 route, a land route, in furthering Spanish aims. And in
4 fact, this is on page 7 of my report, and if you look at
5 explanatory footnote, the literature is extensive
6 concerning this.

7 Often diarists noted the remnants of the
8 Hohokam civilization that marked the lower reaches of the
9 Gila from its confluence with the Salt. Sergeant Juan
10 Bautista de Escalante on recon of the Gila basin in
11 November of 1697 took note of ruins on the north side of
12 the, quote, irregular river. And I quote him again: "On
13 the 18th, we continued west over an extensive plain,
14 sterile and without pasture, and at the end of five miles,
15 we discovered on the other side of the river" -- this is
16 the Gila -- "other houses and edifices. The sergeant swam
17 over with two companions to examine them. And they said
18 the walls were two yards in thickness like those of a
19 fort. And that there were other ruins about, all of
20 ancient date."

21 Later in 1775 and '76 -- and this has been
22 referenced earlier by several people -- Don Juan Bautista
23 de Anza led a colonizing expedition from Tucson to San
24 Francisco. Father Pedro Font -- and I don't know why I
25 stuck this phrase in here -- who irritated Anta greatly.

1 Anta and he didn't get along, obviously. Nevertheless, he
2 kept the best diary of this historic expedition which
3 followed the Santa Cruz to the Gila then down to its
4 confluence with the Colorado River. The Gila portion of
5 the journey, which lasted from October 30th to November
6 28th, 1775, covered 231 miles, brought forth some
7 noteworthy observations of the Gila's flow. According to
8 Font, there were Indian agricultural systems diverting
9 water, dry stretches, and occasional deep reaches that
10 coursed slowly down the stream bed. In effect, the Gila,
11 in the fall of 1775 -- and this is another one of these
12 snapshots that we have been hearing about and I have heard
13 reference to today -- was intermittent and erratic and in
14 many reaches dry.

15 References to the Gila from the period of
16 the Mexican revolution of 1810 - 1821 and through the
17 Mexican period -- historians like the 1821 to
18 1848 reference here -- they vary little from accounts of a
19 deep flow with an occasional destructive flooding in
20 spring. Pressure -- so to end this short section, which
21 precedes, I think, the heart of Dr. Littlefield's account,
22 I think are historic of American expansions, are unanimous
23 in their interpretation of the primary objective of the
24 war with Mexico, which was from 1846 to '48. The
25 acquisition of California, and with the treaty of

1 Guadalupe Hidalgo in 1848 and the subsequent Gadsden
2 Purchase of 1853-'54 affirming the American title to the
3 land bisected by the Gila. Much change in legal,
4 political and social context, yet the Gila continued to
5 serve, as it had for centuries, as an overland
6 transportation route. For the Mormon battalion in 1846,
7 which Mr. Gilpin and others have referenced; it's shortly
8 thereafter for thousands of gold seekers, which was
9 referenced as well; it worked well as a thoroughfare to
10 California as the westward tilt of American civilization
11 commenced in earnest. And with that, I think research and
12 collections detailing American settlement and organization
13 of these western territories lends insight into the nature
14 of the Gila during the period 1848 to 1912, which you will
15 be discussing and hearing about for the next couple of
16 hours. One of the largest and most important groups of
17 records created in relation to the Gila prior to statehood
18 were those of the U.S. government, particularly federal
19 surveys and therefore, I defer to your subsequent
20 discussion.

21 Now, let me skip toward the end of my
22 written account for you and discuss a little bit about
23 statehood and some accounts prior to statehood. I think
24 the further buttress of my discussion in this report and
25 analysis of the evidence that I presented for you, there

1 are a variety of documents, press accounts, military
2 records, unpublished manuscripts, and personal memoirs
3 that suggest a lack of commercial navigability of the Gila
4 River. Gregory McNamee, he's a noted environmental
5 writer, and some of you may remember him as an editor at
6 the University of Arizona Press. He got on the other side
7 and started writing, and in his well-received 1994 book
8 "Gila: The Life and Death of an American River," he cites
9 several examples of the river's non-navigability at
10 statehood. According to McNamee, the Gila began to dry up
11 with the arrival of Anglo-American farmers whose crops
12 included plants not well-suited for the desert. And I
13 think we did hear some reference to that today. Egyptian
14 cotton, soft wheat, and eventually citrus and nuts. The
15 effect, according to McNamee, was it contains. Further,
16 he asserts that within a few years, the river being
17 diverted by Mormon planters upstream, quote, the bed of
18 the middle and lower river was dry.

19 That's on page 125 of his book on the Gila.
20 Sue Summers, another example, this is a contemporary
21 account. She arrived at the desert oasis town of
22 Florence, Arizona with her attorney husband in 1879. She
23 rode her stagecoach pride from Casa Grande to their new
24 home along the Gila River. She noted that this was
25 shortly after, quote, the Mormon dams had been built.

1 Quote, I had so much of the raging Gila which I now
2 understood we would have to cross before reaching our
3 destination that I must confess I had a feeling of fear at
4 the prospect of fording it. Imagine my astonishment when
5 we came to a halt within a short distance of Florence and
6 my husband, with an amusing smile, announced that the huge
7 valley of sand on which we are resting was the bed of the
8 Gila River.

9 I think, moreover, industrialized farming
10 changed the nape of the Gila River and the Gila basin,
11 beginning with the Mormon colonization which I just
12 referenced, of the fertile Mill River. Agriculture had
13 provided a strong lure for settlement and exploit. The
14 end of the Apache wars of the 1880s proved the last
15 disincentive. The farmers came, founding towns like
16 Coolidge and Casa Grande, swelling the populations of
17 Phoenix and the surrounding agricultural communities.
18 Coupled with the homestead and the desert land act
19 referenced earlier in this report -- and of course
20 others -- the Gila soon sprouted up patchwork of small
21 farms that produced beans, corn, tomatoes, melons,
22 pumpkins in Phoenix's early days, and other goods.

23 The vigorous exploitation of the use of the
24 river's resources further depleted the river's flow
25 downstream along the Gila. Couple more examples and then

1 I'll get off and we can go forward.

2 When Anglos first came to the southwest in
3 large numbers, particularly after 1850, the Gila no longer
4 carried enough water to float a raft. That's in Tom
5 Sheridan's kind of classic account, "Arizona: A History,"
6 University of Arizona Press, 1996. So I'm deferring to
7 Dr. Sheridan, who actually is an anthropologist, but he
8 writes like a historian. I don't know if that's good or
9 bad. For newcomers who had read of the abundant waters of
10 the desert, this was a source of no small amount of
11 confusion. One government inspector charged with Indian
12 affairs when he came to Arizona in the 1880s carried with
13 him an official map showing the Gila was a live -- as
14 live, flowing river. He asked at Yuma when the next boat
15 would sail for the Pima villages and was told, quote,
16 well, when the Gila gets water, we'll be sure to get a
17 line of boats running for your convenience.

18 The inspector, thereupon, produced his map,
19 declared the surveyors of the U.S. government could not
20 possibly be wrong. Eventually frustrated at his -- the
21 refusal to admit that the river was navigable, he took a
22 stagecoach. At the stage stop at Maricopa Wells, he
23 related his Yuma story to the driver who told him, quote,
24 you must have fallen in with a damn lot of liars working
25 in the interest of the stagecoach line. The Gila is

1 navigable. A boat leaves Yuma every day for the Pima
2 villages. Look, there's one now. He pointed to a column
3 of whirling smoke-like dust a few miles in the distance.
4 The inspector grabbed his bag and went off to the column
5 of smoke, an hour later the driver wandered into the
6 saloon and bragged about his prank. Fortunately for the
7 inspector, a good samaritan retrieved him because he had
8 fainted in the desert. The tale relates how
9 contemporaries viewed the river. It was literally a joke
10 concerning navigability.

11 I think similar to the pranks, which is
12 something well below in recent history, two days before
13 Christmas in 1944, 25 German sailors who had been interred
14 as prisoners in Papago Park on the bank of the Salt
15 tunneled out with the intention of stealing a boat and
16 sailing down the Gila and Colorado to Mexico. They too
17 carried maps that showed the Gila to be a perennial river.
18 But when they reached its banks and saw a trickle of
19 water, they abandoned the plan and set downriver on foot;
20 within days both were rounded up and returned to the
21 prisoner camp. Their leader, Captain Wolfgang Claress,
22 later complained, "I only wished the Gila really had been
23 a river. If it has no water, why do the Americans show it
24 on their maps?"

25 One or two more then we'll move on.

1 Odie B. Faulk. I think last generation's
2 kind of popular historian of Arizona. I think his
3 productive years span out, I think, 1950 to 1970. I don't
4 know where he is now. But in one of his books, kind of a
5 classic account, "Destiny Road - The Gila Trail and the
6 Opening of the Southwest," was undeniable but the river
7 itself was not useful for transportation. He allowed,
8 quote, that the Gila trail should be of such importance it
9 was incomprehensible to men in the eastern United States
10 during the 1850s. So there had been rivers that provided
11 the natural highways for pioneering. These, in turn, had
12 carried and produced flat boats, keelboats, steamboats,
13 and along their banks, men had planted their farms and
14 built their cities.

15 Faulk continued that in the arid region of
16 the American southwest, however, no such water route was
17 available and a road such as the Gila River became the
18 route of exploration, conquest, transportation, and
19 communication. We have heard the accounts of Cooke and the
20 Mormon battalion, William Emory. I will forego that. I
21 have several newspaper accounts, selections, and of course
22 we have heard discussion of the Buckey O'Neill and the
23 guys that went down in the "Yuma or Bust" expedition, left
24 Phoenix for the purpose of exploring the Salt and Gila,
25 only 12 miles from here all wading and mud, and I think

1 the mud turtle reference was that they were as happy as
2 mud turtles. But I think the point is that the
3 overwhelming evidence suggests that since modern
4 settlement began in Arizona in the mid-19th century, the
5 Gila River was a non-navigable stream. I think the
6 documentary evidence is daunting in its scope and its size
7 from unpublished and published sources, federal, state,
8 territorial reference, diaries, newspapers, journals, and
9 a variety of other archival sources that are irrefutable.
10 On record at the Arizona Historical Foundation we have
11 remarkable selections documenting the history of Arizona
12 and just dipping into our archival holdings randomly.
13 This is evident as well.

14 So I think I'll conclude here by that, taken
15 together -- I think this multitude of variety of sources,
16 voluminous in extent in covering a variety of disciplines
17 and perspectives, add further credence to the only
18 plausible conclusion I could reach, at least that the Gila
19 was not navigable or susceptible to navigation on or
20 before February 14th, 1912, when our great state entered
21 the union.

22 So I think that was brief and to point.

23 Any questions?

24 (Dr. August is answering questions.)

25 BY COMMISSIONER BRASHEAR:

1 Q. You had a reference earlier in the testimony
2 today about boat travel up to a place called -- was it
3 Dome?

4 A. Dome, yeah.

5 Q. And you didn't mention that.

6 A. I don't know if I mentioned it in this or not,
7 but we discussed it, and I think that --

8 Q. But I wondered if -- do you contend that that
9 experience with what happened there is no evidence of
10 navigability on that section of the river?

11 A. I think that may have been an episode as opposed
12 to the idea of susceptibility for navigation for commerce.

13 Q. Do you know how long it ran or how many trips
14 were made up and down the thing or what?

15 A. It's my understanding, one -- if anyone can
16 correct me that knows about the Dome experience up the
17 Gila I think it's 18 or 20 miles, if I'm not mistaken. I
18 go to Yuma quite a bit, and I almost have every mile down.

19 Q. Was it used over a period of time or just
20 one year or one trip?

21 A. I think one trip, from any understanding, but I
22 would have to, you know -- I would have to -- I would be
23 glad to further research it. I'm kind of curious myself.

24 COMMISSIONER BRASHEAR: Okay. Thank you.

25 CHAIRMAN EISENHOWER: Mr. Jennings?

1 COMMISSION COUNSEL JENNINGS: Dr. August?

2 DR. AUGUST: Yes.

3 COMMISSION COUNSEL JENNINGS: Your opinion
4 of the non-navigability covers the entire Gila River from
5 the New Mexico border to confluence of the Colorado?

6 DR. AUGUST: For the most part, I'm
7 focussing on the areas -- I focused this report on Buckeye
8 and Paloma, from really Buckeye on down to the confluence.
9 But from what I can tell, with other references, I would
10 also conclude that it was not navigable at the time of
11 statehood. All reaches of it at this time.

12 CHAIRMAN EISENHOWER: Is there anybody in
13 the audience that has any questions for Dr. August?

14 MR. HELM: Probably.

15 First of all, it is my understanding that
16 Dr. August's report was just filed today.

17 CHAIRMAN EISENHOWER: Yes.

18 MR. HELM: We request at least 30 days to
19 file a factual response to Dr. August's report. Obviously
20 I haven't even had an opportunity to read it here. So I
21 think I can cross-examine him --

22 COMMISSIONER ECHEVERRIA: What have you been
23 doing all afternoon?

24 MR. HELM: Talking too much, clearly. We
25 haven't had a chance to read it. Obviously our experts

1 haven't had a chance to read it, and so I don't -- you
2 know, I don't know what's in it, even.

3 CHAIRMAN EISENHOWER: Under the rules, you
4 have 30 days for a post-hearing.

5 MR. HELM: I'm asking for an additional
6 30 days because this is historical research. The good
7 doctor has cited any number of books that if I have to
8 read them and write a thing, I know I'm not going to make
9 it to 30 days. I'm kind of a slow reader. And we need to
10 allow our expert historians to do their job. This is
11 supposed to be a factual report on navigability, this
12 isn't legal argument which, from what I understood, those
13 responses were for.

14 CHAIRMAN EISENHOWER: Tell you what we'll
15 do, Mr. Helm, we'll take that under consideration and get
16 back to you on the time.

17 MR. HELM: Okay.

18 MS. COPELAND: Mr. Chairman, I want to at
19 least get on the record that we would object to any
20 modification of the rules. It was my original
21 understanding that what he was requesting was 30 days,
22 which would be provided in the rules under the briefing
23 schedule. But it sounds like this is a completely
24 different request, and we will object to that.

25 CHAIRMAN EISENHOWER: That's why we're

1 taking it under consideration.

2 MR. HELM: And if we need a little argument,
3 obviously due process requires a fair opportunity to
4 respond, and when you get it today -- I'll ask the same
5 question as to Dr. Littlefield's report, which we got
6 yesterday, which is 218 pages long.

7 MR. MCGINNIS: Mark McGinnis on behalf of
8 SRP; I'm responding to his -- talking about Dr.
9 Littlefield's report -- most of Dr. Littlefield's report
10 was filed a long time ago. He did do a recent update
11 which we tried to file last Thursday but the commission
12 office was locked and closed on Friday. We didn't
13 actually get it there until Monday. But your rules, I
14 think, contemplate that people can bring to stuff to the
15 hearing. I have never personally done that, but that is
16 the way your rules are set up.

17 CHAIRMAN EISENHOWER: That is the way the
18 rules are, that's correct.

19 MR. MCGINNIS: If we start adding additional
20 time, it's just going to go on and on, so we would object
21 to any additional time after the hearing is closed.

22 MR. WOODFORD: I would also like to object
23 to 60 days for them to enter into factual evidence on the
24 report here. I mean, that's what this hearing was for
25 today. Mr. Helm keeps alluding to his expert, and I don't

1 know if his expert is here to testify or not.

2 MR. HELM: He's sitting over there in the
3 corner, Brad.

4 MR. WOODFORD: Fine. Then he can testify,
5 just like Mr. August did. We're certainly not going to
6 ask for another 60 days after his factual evidence is
7 submitted. I think this hearing is for the factual
8 evidence, the 30 days is for the legal argument.

9 CHAIRMAN EISENHOWER: This hearing is to
10 bring evidence to the commission. That's what we're here
11 for.

12 MR. HELM: I understand that. But due
13 process guaranteed to us by the Constitution provides that
14 everybody has a chance to respond and to reasonably
15 examine the witness. When you're not given a chance to
16 prepare to do that, by every case law that's every been
17 had, that's not due process. I understand why Brad
18 doesn't want me to have that time. It's his witness.
19 It's his sandbagging laid on us, the same for the Buckeye
20 people, and I understand to the extent that Mark did it
21 yesterday, it's a convenient -- we didn't play that game.

22 CHAIRMAN EISENHOWER: We've all had the
23 chance to bring evidence -- on cross-examination evidence.
24 So if you want to bring evidence, fine, that's what we're
25 here for. We want to hear it.

1 MR. HELM: My point is that I don't have a
2 chance to bring any evidence to rebut this report when I
3 just got it less than a half hour ago.

4 CHAIRMAN EISENHOWER: You have 30 days.

5 MR. HELM: It's my understanding that 30
6 days is for the legal --

7 CHAIRMAN EISENHOWER: Post-hearing
8 memorandum. Anything that's said in here.

9 MR. HELM: You'll accept new evidence?

10 CHAIRMAN EISENHOWER: Whatever you hear
11 here, you can respond to, and you heard Dr. August's
12 testimony.

13 MR. HELM: I can respond to it with new
14 evidence that's not here. That's perfectly fine with me.
15 That's all I was asking.

16 CHAIRMAN EISENHOWER: That's not what I
17 said. I said you can respond to evidence that you heard
18 hear.

19 MR. HELM: By submitting other evidence?

20 CHAIRMAN EISENHOWER: But you can submit
21 evidence today.

22 MR. HELM: If I've got it here, I would be
23 happy --

24 CHAIRMAN EISENHOWER: At the end of today,
25 the evidentiary hearing of the Gila River is going to be

1 closed. There will be no evidence, just response
2 memorandum.

3 MR. HELM: Okay. If that's your position --

4 CHAIRMAN EISENHOWER: That's what the rules
5 say.

6 MR. HELM: I'll tell you right now, it's my
7 position that's unconstitutional, deprivation, and
8 violates due process. And I'll live with it. I have to
9 live within your rules. But I'm going to tell you right
10 now it will be an issue that will come down the line
11 because you're not allowing us to respond to this evidence
12 you accepted today.

13 CHAIRMAN EISENHOWER: You can respond right
14 now.

15 MR. HELM: I'm not a qualified historian.
16 You want me to testify that everything that Dr. August
17 said was hooey. And that will have no bearing because
18 I -- I got a history degree in undergraduate school, but I
19 really don't have one in ancient and near western
20 civilization, so I don't think any court would pay a lot
21 of attention to me if that's the route we're going to
22 take. I'll live with that. We'll deal with it when it
23 gets to court, not a problem. But I have to make it on
24 the record that I think you're denying us the fair
25 opportunity to present our position by denying us the

1 right to rebut the facts that are brought out on the day
2 of the hearing.

3 COMMISSION COUNSEL JENNINGS: Mr. Chairman,
4 it should be noted for the record that the gentleman just
5 filed today two and a half boxes of, I presume, evidence,
6 his own that he brought in which the other side is not
7 going have an opportunity to submit any adverse or
8 evidence contrary thereto. They can file briefs, and
9 we've been pretty liberal in our briefs, as the chairman
10 knows, in allowing it to lapse over into some factual,
11 some legal. We don't hold with the appellate rules of
12 strictly legal matters. And I assume that the opponents
13 to your position will be commenting on the stuff that you
14 filed, assuming that you introduce it today. You
15 certainly furnished it to the commission.

16 MR. HELM: I will be amazed if they will
17 curtsy. I guess you didn't look at it because those are
18 the surveys that Dr. Littlefield is relying on. They have
19 been referenced in Dr. Littlefield's report, at least as
20 far as I know for, four or five years. That's not new
21 evidence, that's just bringing it down so you can have it.

22 COMMISSION COUNSEL JENNINGS: I didn't know
23 what it was because we -- you just filed it today.

24 MR. HELM: I just -- does it matter? It's
25 the Littlefield survey.

1 COMMISSION COUNSEL JENNINGS: The same rules
2 should apply to you that apply to the other witness.

3 MR. HELM: I think that's absolutely true.

4 COMMISSION COUNSEL JENNINGS: The rules --

5 MR. HELM: If I bring something new to the
6 table, I think that anybody here ought to have a
7 reasonable time to respond to it and present evidence if
8 they've got any that contradicts it. That's what's called
9 due process where I grew up.

10 COMMISSION COUNSEL JENNINGS: And then you
11 would have time to rebut their response, and then we have
12 a surrebutter and so forth -- we would never conclude a
13 hearing.

14 MR. HELM: I disagree with you. I realize
15 that you could say "I'm not into that," but we're not here
16 asking for that. We're just asking to give an initial
17 response. I don't even know if I'm going to because I
18 haven't had an opportunity to read it. But to protect the
19 interests of my client, it's necessary to make that point
20 on the record that this was brand new, never heard about
21 it before today, never heard about the conquistadors or
22 anything like that. We checked your website and
23 everything, almost daily basis. It's not there. This is
24 brand new as far as I know. And I'm not going to have any
25 opportunity to see if it's -- see if we agree with it, see

1 if we don't disagree with it, see if there is evidence to
2 rebut it because you've just told me this is it. I'm
3 taking it because they can bring it in today, but tough
4 luck to me. Well, I just don't think that comports with
5 our rules of fair play. I can't do anything about it
6 until we get to the next level, but that's fair enough.

7 CHAIRMAN EISENHOWER: That's what the
8 post-hearing memorandum are all about.

9 MR. HELM: Well, I'm confused then.

10 CHAIRMAN EISENHOWER: Well, what do you
11 think the post-hearing memorandum is supposed to be?

12 MR. HELM: What you just told me was not to
13 submit any new evidence that could rebut this. It was for
14 me to write about to say, "This is baloney." I can say
15 this is baloney and I can -- but I can't say, "And it's
16 contradicted by Joe Smith, a noted historian, who wrote 15
17 books on the time topic and here is that evidence." I
18 can't give you that. You just told me that.

19 CHAIRMAN EISENHOWER: No, you can. But
20 you've got to put it in your post-hearing memorandum.

21 MR. HELM: I want to be able to put the
22 new -- if there is any evidence to contradict that, I want
23 to get it in. If I have to put it in my post-hearing
24 memorandum, there is no objection to doing that. I'm more
25 than happy to do that.

1 CHAIRMAN EISENHOWER: That's what it's there
2 for.

3 MR. HELM: So I can put new evidence in?

4 CHAIRMAN EISENHOWER: If that's your
5 response.

6 MR. HELM: Which is it?

7 COMMISSIONER ECHEVERRIA: Would a response
8 in opposition supported by specific references, would that
9 be considered new evidence?

10 MR. MCGINNIS: Mark McGinnis on behalf of
11 SRP. I think the idea of putting new evidence a
12 post-hearing memorandum -- which is really traditionally
13 the legal briefs -- is problematic because then you have
14 evidence submitted 30 days from now and then you're going
15 to have the same problem. Because whoever was doing it
16 is going to put in new evidence and the other side is
17 going to say, "Oh, we just got this new evidence. We
18 need more time to do it." I mean, it's just the idea --
19 if you're going to give him 30 days, give him 30 days and
20 then we'll start the briefs from there, but don't
21 incorporate the new evidence into the post-hearing
22 memorandum.

23 MR. HELM: I don't have any problem. I'm
24 just saying that when you get sandbagged, you ought to
25 have a right to respond to it. That's the way we play the

1 game in the United States. I have never heard it played
2 any other way. If we're not going to play it here, that's
3 fair, it's on the record, and I'll do with what I may
4 after that, you know, if I have to do anything with it. I
5 just want to know, which is it? And how is it going to be
6 done? I guess Mark wants -- if I'm going to be allowed to
7 do that, given 30 days, and I don't have a problem with
8 that. Albeit for those people who submitted the
9 memorandums, obviously they've had this for who knows how
10 long. The point is, I don't have any problem. If they
11 want to then have 30 days after that, what isn't a legal
12 memorandum, not a problem with my perspective.

13 MR. MCGINNIS: As I was trying to say, the
14 problem with that is if you have this sequential evidence,
15 instead of doing it in one hearing, he's going to have
16 30 days to put in evidence that he thinks rebuts whatever
17 person put in today. And then I'm going to say, "Well,
18 that's new evidence I haven't seen before that John just
19 put in so I want another 30 days," and we're going to be
20 here until 2010.

21 COMMISSIONER ECHEVERRIA: You are.

22 MR. MCGINNIS: You're still going to be
23 here.

24 The rules are set up the way they are and
25 that's what we've lived with for the last however many

1 years. The rules have been, you show up with your
2 evidence at the hearing; if you want to do it beforehand,
3 you do. That's what we've always done. A little bit less
4 than normal this time because of the three days you were
5 closed. But you have had that report, John, for
6 four years except for the new stuff that you got a couple
7 of days ago. So that's just the way the rules are.

8 COMMISSION COUNSEL JENNINGS: Mr. Chairman,
9 more than anything, I don't appreciate the being
10 sandbagged idea. This gentleman took Mr. Littlefield's
11 deposition some years ago and submitted it as a piece of
12 evidence. If he wanted to, he could have taken Jack
13 August's deposition, noticed it, and he would then have
14 been fully informed as to what his evidence was.

15 MR. HELM: I move we adjourn, and I'll go
16 and take it right now. I just found out about it.

17 Curtis, I am not a mind reader. I didn't
18 know who Jack August was or that he was going to testify
19 here today until Buckeye called him up to the table. How
20 could I take his deposition? That's what I'm griping
21 about. It is a sandbag.

22 (An off-the-record discussion ensued.)

23 MR. STAUDENMAIER: Bill Staudenmaier, I
24 represent Phelps Dodge in these proceedings. Not my
25 witness here. I don't have a witness to present today,

1 but the accusation of sandbagging is nonsense, and it
2 works in both directions. Mr. Helm has just told you that
3 he has a witness here. I don't even know his name, much
4 less what he is going to testify to. And I have no more
5 right than he does to suspend these proceedings for
6 another month so that I can adequately prepare a
7 cross-examination of his witness, whose name I don't know.
8 So sandbagging isn't -- it's just not a valid accusation.

9 MR. HELM: If he had read the record, he'd
10 have found out that his name is Wynn Hjalmarson because
11 his report has been on file with your commission for some
12 four or five years.

13 MS. COPELAND: Kirsten Copeland for
14 Buckeye -- Buckeye entities. I just want to follow up
15 real quick. Our witness, Jack August, is here for
16 cross-examination. He's available for any questions that
17 anyone may have about either the testimony he gave here or
18 his report. And I believe that that satisfies exactly
19 what the commission's rules required and that have been in
20 place for a number of years.

21 CHAIRMAN EISENHOWER: Correct.

22 MS. COPELAND: And that's the end.

23 MR. HELM: I have no problem. I'm just
24 making on the record that --

25 CHAIRMAN EISENHOWER: Are you going to

1 cross-examine Dr. August?

2 MR. HELM: I'm absolutely going to do it to
3 the best of my ability right now, but I want it on the
4 record that this report is brand new, and we haven't had a
5 chance to rebut. And I'm not going to be allowed to have
6 the chance by the presentation of any evidence. And I'll
7 be happy to ask a few questions I can come up with for
8 Dr. August off the top of my head.

9 (An off-the-record discussion ensued.)

10 CHAIRMAN EISENHOWER: Okay. Shall we
11 continue?

12 Mr. Helm.

13 MR. HELM: Thank you.

14 (Dr. August is answering questions.)

15 BY MR. HELM:

16 Q. Dr. August, you're a historian by profession?

17 A. Yes.

18 Q. You don't claim any expertise as a hydrologist,
19 geologist, geomorphologist, surveyor, assayer, any of
20 those related fields?

21 A. No.

22 Q. And your report that you have given to the
23 commission today is from a historian's perspective?

24 A. Very much so.

25 Q. Okay. One of the things that I heard you talk

1 about in that report was that the river didn't have any
2 water in it in a number of -- I'm not sure --

3 A. Snapshots.

4 Q. Snapshots. But they were related to a time
5 period back when the Spanish were here, that sort of
6 thing.

7 Now, as far as I know -- and I'd be willing
8 to stand corrected -- but I think of all of the -- what I
9 will call hydrologists, geomorphologists, et cetera, group
10 has opined that prior to sometime before statehood, the
11 Gila River was a perennial river, i.e., had water in it
12 all time. How do you reconcile the historic, "We got no
13 river," and the scientific, "You got a river and water
14 in it"?

15 A. Well, all I could do is depend upon the
16 documents. And one thing about the Spaniards, one of the
17 first things that I think a master student marked
18 particularly in the Western Reporter Land History it was
19 called, and still is in many cases, is that the Spaniards
20 were really quite good, they did things in duplicate,
21 triplicate, quadruplicate. You could find a report in
22 Chihuahua City which was also the same report copied in
23 Mexico City and Seville. They were pretty darn good
24 recordkeepers. We know that a guy named E.G. Bolen that
25 went down there. So I don't think that they were making

1 this stuff up. The diarists, most Spanish colonization,
2 that person was contract, really pretty much a very
3 legalistic process and so those reports and the diarist
4 that went along with them oftentimes got the conquistador,
5 like Coronado, in trouble. So we do know that they kept
6 diaries and so these reports are stuff I just did to
7 basically supplement what was already here, because I
8 didn't want to go over and repeat what we have already
9 done. The report covers the Anglo period as well. What
10 the evidence tells me, and with the reports, is that there
11 seems to be some continuity rather than change. This
12 river seemed to be in flood and then there would be
13 drought. So it would be dry some times of the year and
14 then sometimes it would flooded.

15 Q. How many days would you estimate, back when the
16 conquistadors were roaring and burning across the
17 Southwest, did they view the Gila River?

18 A. I would say, from what I have seen in my
19 research, 70 percent dry, 30 percent some kind of stream
20 flow.

21 Q. What I'm saying is they just passed through, for
22 example, they didn't stay on the -- they camped on the
23 Gila for three years?

24 A. Right.

25 Q. So that's their snapshot of a day crossing the

1 Gila River or two days crossing the Gila, correct?

2 A. Right. And I think the various expeditions --
3 Onate was mentioned -- his base was Santa Fe and he went
4 out looking for the Pacific Ocean and a variety of things.
5 Onate was referenced in 1598 to around 1607, he goes down
6 there and they follow the Gila River, but it's a highway,
7 not a waterway. So that's an example. But almost every
8 Spanish expedition is documented, and we know who went
9 where, how many people with them, how many cattle they
10 took, et cetera.

11 Q. And we're talking over, what, 200 years, 300
12 years?

13 A. 1598 to roughly 1821, so the revolution is over.

14 Q. About 300 years, give or take. We don't have to
15 be that accurate.

16 A. Few centuries.

17 Q. And in that 300 years, how many days would you
18 estimate the Spanish were on the Gila River?

19 A. How many days? I would say maybe -- out of
20 200-plus years, probably toward the end of that period,
21 more often, but I would say 50 years worth. I mean, they
22 somehow had contact with it or knew about it.

23 Q. Well, knowing about it -- I can know about it and
24 never see it, right?

25 A. Yeah.

1 Q. I'm talking about eyeball-to-eyeball contact with
2 the Gila River, being able to see it, judge how much water
3 it has in it. How many days would you --

4 A. How many expeditions were there, probably -- let
5 me just deduce this. I think from the number of
6 expeditions, probably 15 to 20.

7 Q. 15 to 20 days?

8 A. Expeditions that were on it -- they could
9 extrapolate it.

10 Q. Spent how many days?

11 A. Maybe weeks at a time. So several weeks
12 altogether, maybe two to three years if you're trying to
13 add a number of days, again just deducing.

14 Q. So their opinions would be based on that time
15 frame?

16 A. Their time frame, and their accounts -- their
17 diarists' accounts.

18 Q. You couldn't use those opinions to give you a
19 total history of the Gila River for that 300 years?

20 A. Snapshot -- this snapshot -- what the accounts
21 reveal.

22 Q. Now, you mentioned something -- I just missed it,
23 I'm sorry -- that in the report that you had dealt with an
24 area from the Buckeye canal, did you say?

25 A. Yeah. This is just a reference for the

1 Buckeye --

2 Q. And then I thought you said the confluence or
3 something.

4 MS. COPELAND: Excuse me. You guys are
5 going to kill the court reporter talking over each other.

6 BY MR. HELM:

7 Q. Did you say to the confluence? We're trying to
8 get the geographic area that is related to it?

9 A. Pretty much that area down through Paloma Farms.
10 I paid special attention to that in the report.

11 Q. But basically --

12 A. Beyond Gila Bend, Arizona, maybe 15, 20 miles.

13 Q. Painted Rock Dam?

14 A. Yeah. That's not specifically mentioned in the
15 report though.

16 CHAIRMAN EISENHOWER: Just a minute. Joe?

17 MR. SPARKS: I would like to ask the Chair
18 to require the -- Mr. Helm to ask a question and then Mr.
19 August to have an opportunity to answer it before Mr. Helm
20 starts another one. And then I want to make a point of
21 personal observation. Mr. Helm is so old that he knows
22 what a knife was doing because we both there. So I think
23 we ought to put him on the stand because we're both four
24 or five hundred years old and we went along. So then he
25 can't remember because the tequila is another issue.

1 But the first part of my objection was
2 serious.

3 CHAIRMAN EISENHOWER: Because we're trying
4 to get an accurate verbal record.

5 MR. HELM: Sure.

6 CHAIRMAN EISENHOWER: Question, answer.
7 Question, answer. Don't override, please.

8 Okay. Continue.

9 (Dr. August is answering questions.)

10 BY MR. HELM:

11 Q. You testified about -- I'm not sure whether it
12 was correspondence or something from a Mr. Reed to
13 Mr. Hill --

14 A. Yes.

15 Q. -- in 1913, indicating that there was a 103 -- is
16 it CFS flowing in the river?

17 A. Yes.

18 Q. On whatever day they were referring to?

19 A. Yes.

20 Q. Well, one, you agreed that establishes that there
21 was water flowing in the river?

22 A. Yes. Not the dam issues.

23 Q. Okay. And two, would you agree in 1913 that the
24 river had, number one, been appropriated beyond its water
25 availability?

1 A. Appropriated to users?

2 Q. Yes.

3 A. I would think so.

4 Q. Would you agree that it had been, if not totally
5 diverted by that time, virtually total diverted?

6 A. Yes.

7 (An off-the-record discussion ensued.)

8 (Dr. August is answering questions.)

9 BY MR. HELM:

10 Q. So to the extent that you talk about this kind of
11 evidence, you're not talking about the Gila River in its
12 natural and ordinary condition, are you?

13 A. At that point in history, no. Spanish reference,
14 obviously yes.

15 Q. Let's talk a minute about the standard that you
16 used to determine what navigability is, all right? Do you
17 understand what I mean?

18 A. Sure.

19 Q. Is your report done to the federal test set out
20 in Daniel Ball to determine navigability?

21 A. I would think, as I watched Dr. Littlefield
22 testify, the fact would be -- I want to say yes, I
23 understand the case. Commercial navigation, thinking
24 about those things. But in terms of knowing the legal
25 definition and how it's argued amongst the attorneys here,

1 I'm not that concerned with what I read here this morning.

2 Q. What you did was not -- you didn't specifically
3 write it to meet the definition in Daniel Ball?

4 A. I had no conclusion preordained when I went about
5 it. I just went through the term.

6 Q. You didn't write it to mean the tests set out in
7 the Defenders of Wildlife versus Hull lawsuit?

8 A. No. I'm aware of those suits, but no.

9 Q. You didn't have any particular standard to
10 determine navigability, then?

11 A. I know of the discussion -- the legal discussion,
12 and I was aware of it. I wouldn't say that I did not, but
13 I did not go about writing this report with some notion of
14 navigability versus non-navigability in my conclusions.

15 Q. You opined that it's not navigable?

16 A. Yes.

17 Q. In order to say something is not navigable, you
18 must know what navigable means, right?

19 A. Yes. And I'm aware of footing doctrine, all the
20 issues that are involved. In fact, that is written in
21 introduction of this.

22 Q. Tell me your definition of navigability.

23 A. My definition of navigability. In commerce, if
24 you can float a log down and somehow conduct commerce,
25 float down it, that would be navigable.

1 Q. It's your opinion that you have to have commerce
2 in order make it navigable?

3 A. Not necessarily.

4 Q. Could I establish navigability if I could float a
5 reasonably large boat down a river even though it was for
6 a non-commercial purpose?

7 MS. COPELAND: I'd like to object. I know
8 the commission really hates objections here, but Mr. Helm
9 is really trying to solicit a legal opinion out of someone
10 who is not here to provide that testimony.

11 DR. AUGUST: I try to stay away from that.

12 MS. COPELAND: I know you guys hate that,
13 but I got to do it.

14 CHAIRMAN EISENHOWER: Point well taken.

15 MR. HELM: If we don't know the standard he
16 used to determine his conclusion that river was not
17 navigable, then it's absolutely meaningless, his entire
18 report, his testimony. So I don't think it's worth it.
19 If you don't want me to go that route, I won't. But it
20 will be on the record.

21 CHAIRMAN EISENHOWER: Mr. Helm, he is not a
22 lawyer. He's a historian. He wrote it from a historical
23 viewpoint.

24 MR. HELM: And understand this -- and I'll
25 put it on the record right now -- every question I ask

1 him, I'm not asking him for a legal opinion. I'm asking
2 him as a historian what he thought the standard was that
3 he was to measure the evidence he found against to
4 determine whether a river was navigable or not.

5 CHAIRMAN EISENHOWER: All right. You've
6 asked the question.

7 MR. HELM: That's the question I asked him.

8 CHAIRMAN EISENHOWER: You've asked him that.

9 MR. HELM: I had an objection. Does his
10 answer stand?

11 MS. COPELAND: He can answer the question.
12 I wanted to get that on the record. He can answer to the
13 best of his ability given his background.

14 MR. HELM: That is all the question is
15 implied to be.

16 DR. AUGUST: I answered.

17 (Dr. August is answering questions.)

18 BY MR. HELM:

19 Q. Now, you testified here that you affirm the
20 report that Dr. Littlefield rendered in this matter,
21 correct?

22 A. Yes. I have the report that you had four years
23 ago. I based -- looked at it, footnotes, analyzed it and
24 really, I have no objection or do not disagree with the
25 conclusions set up in Dr. Littlefield's report.

1 Q. And you haven't seen his new one?

2 A. I have not.

3 Q. So your report --

4 A. I wrote that earlier, yes.

5 Q. You're affirming his older one?

6 A. I'm affirming his older one, yes.

7 Q. Will you affirm the answers that he gives on
8 cross-examination about what he did?

9 A. I don't know how I'm going to be here. I may be
10 dead. I would have to read the record.

11 Q. Are all your authorities that you are relying on
12 for your testimony here set out in your report?

13 A. Are they here?

14 Q. Just --

15 A. Yes.

16 Q. Footnoted?

17 A. Yes. I followed all the attributions, yes.

18 Q. Did you do any specific historical research to
19 find out the amounts of water that were carried by the
20 Gila River at any time?

21 A. No, not specific amounts. Whenever they came up
22 in any kind of documents, of course I did those, but to do
23 that --

24 Q. You did know one, you talked about a sergeant
25 swimming?

1 A. Yes -- wading across the river.

2 Q. Swimming or wading?

3 A. He was wading, kind of walked across.

4 Q. You also mentioned the treaty of Guadalupe
5 Hidalgo. And I haven't read your report, but did you
6 discuss in your report the provisions in the treaty of
7 Guadalupe Hidalgo dealing with the navigability of the
8 river Gila River?

9 A. Article five and six, I believe, are dealing with
10 them, yes.

11 Q. That's off the top of my head.

12 A. I'm familiar with them.

13 Q. Did you discuss them in your report?

14 A. No, I didn't discuss them specifically. I
15 discussed them in detail on the Santa Cruz. But for this
16 report, I included that provision and well, that's
17 mentioned, I think, that was Article 6. It's nice in
18 theory, but in practice, I don't --

19 Q. Can you imagine why two governments would have
20 negotiated a treaty that stated that a river was navigable
21 and that it would be maintained navigable -- I forget, for
22 the birds fly?

23 A. When I read that, I just thought they were people
24 that negotiated the treaty that were east of the
25 Mississippi River and had never been west of it, and --

1 someone from Mexico City?

2 Q. Do you think the people who had never been west
3 of the Mississippi had governmental reports from people
4 who had been west of the Mississippi, who might have told
5 them that it was navigable?

6 A. I'm sure there was impressionistic knowledge that
7 it was neither navigable or non-navigable, but I don't
8 think that was in the forefront of any kind of analysis.
9 I read it and I note in theory what the negotiators had in
10 mind.

11 Q. Now, you're in agreement that the diversions that
12 took place in the Gila River, either through dams or other
13 means, from the time that western settlements started out
14 here drastically affected the flow of the Gila River and
15 watercourse, et cetera?

16 A. Certainly.

17 Q. That's a yes?

18 A. Yes.

19 Q. Okay. You have a section in your report dealing
20 with surveys, right?

21 A. Yes.

22 Q. Okay. If the chairman doesn't mind, I'm told he
23 has section involving surveys, and as I explained to you
24 earlier, my expert on surveys is Ms. Livesay, so if you
25 don't mind I'll let her finish up with whatever

1 examination questions she would like to ask

2 Dr. Littlefield on surveys.

3 CHAIRMAN EISENHOWER: That's fine.

4 (An off-the-record discussion ensued.)

5 MS. LIVESAY: Mr. Chairman, members of the
6 panel, my name is Roberta Livesay and along with Mr. Helm
7 representing Maricopa County.

8 (Dr. August is answering questions.)

9 BY MS. LIVESAY:

10 Q. I have one general question for you first,
11 Dr. August. The section where you discuss the surveys,
12 did you actually go and look at all of the surveys that
13 had been of the Gila River in a historical context?

14 A. No, I did not look at the primary sources on many
15 of those. I did rely on secondary sources.

16 Q. And were the secondary sources you relied on
17 basically Dr. Littlefield's work?

18 A. Yes. I did check many of those, and many of
19 those are available online, summary sources.

20 Q. What other sources did you look at if you didn't
21 look at the surveys themselves? Besides Dr. Littlefield.
22 What other sources?

23 A. Oh, boy. Suter and Fairfax, I looked at the
24 state lands, which is cited there. I looked at the
25 manuals, they're available almost anywhere.

1 Q. Maybe I can shorten this up real quick.

2 Dr. August, if you didn't look at the
3 surveys and the notes themselves, would be, then, in a
4 position to further --

5 CHAIRMAN EISENHOWER: Excuse me, could you
6 speak to microphone, please?

7 MS. LIVESAY: I'm sorry.

8 (Dr. August is answering questions.)

9 BY MS. LIVESAY:

10 Q. Since you didn't look at the surveys and the
11 notes directly, would you be willing to rely on
12 Dr. Littlefield's answers with regard to the surveys and
13 the notes?

14 A. Absolutely.

15 Q. In that case, Mr. Chairman, I think that we can
16 defer our questions on this section to Dr. Littlefield,
17 and we will just rely on his answers.

18 CHAIRMAN EISENHOWER: Okay. Thank you.

19 MS. COPELAND: If nobody else has
20 anything -- Kirsten Copeland -- I have one follow up
21 question for Mr. August.

22 CHAIRMAN EISENHOWER: Okay.

23 MS. COPELAND: Mr. August --

24 MS. HACHTEL: I would like to ask a few
25 questions when you're finished.

1 MS. COPELAND: I would prefer to wait.

2 CHAIRMAN EISENHOWER: Okay.

3 MS. HACHTEL: Well, as long as you're up
4 there, if you want to go ahead and ask, that's fine.

5 (Dr. August is answering questions.)

6 BY MS. HACHTEL:

7 Q. I just have a couple of questions, the best that
8 I could do.

9 A. Sure.

10 Q. I just want to try to get a few clarifications.
11 Laurie Hachtel, again with the Attorney General's Office
12 for the State Land Department.

13 Mr. August, in the scope of your report --
14 of your study on the Gila River, did you examine the river
15 upstream of the Salt River confluence?

16 A. "Upstream" meaning towards Safford?

17 Q. Correct. Upstream of the Salt River.

18 A. Yeah, yeah, sure. A little. But it wasn't
19 really, really pertinent to what I wanted to discuss here
20 because of the Buckeye and Paloma so --

21 Q. Just to understand what you just said, so you did
22 examine it?

23 A. I examined it in terms of the literature. The
24 general secondary source journal article literature
25 pertaining to the Gila, yes.

1 Q. And what --

2 A. Well, I wrote in my book "Vision in the Desert,"
3 chapter 3 is called "Carl Hayden's 'Indian Card,'" and
4 have written extensively on the Coolidge Dam issue and
5 issues of that nature, so I have written on that and
6 published on that rather extensively. As it -- I think I
7 referenced it in this report, but it wasn't really germane
8 to the stretch of the river that I was concerned with.

9 Q. Okay. And the book that you're referring to was
10 on -- was on the Gila, the Carl Hayden book?

11 A. No. It was a general political biography of Carl
12 Hayden and water resources development from the end of the
13 19th century to -- toward the end of this century, so
14 about a hundred-year period. That was one chapter of the
15 book. And it's -- also, I have written several articles
16 on it.

17 Q. Yes, you mentioned that.

18 On the part of the river, did you look
19 upstream of Florence on the Gila?

20 A. No.

21 Q. How about upstream of Safford?

22 A. No.

23 Q. And then did you consider any systematic stream
24 flow records in forming your opinion regarding
25 navigability?

1 A. No, but I was aware of them. Where I -- I did
2 not analyze them, per se, no.

3 Q. Okay.

4 A. It wasn't --

5 Q. It wasn't part of your report?

6 A. No.

7 Q. And I think you stated that the Gila River was
8 normally dry and -- was it ephemeral? Is that correct?

9 A. Ephemeral, dryness was the description quoted,
10 whether they were the Spaniards, Anglo-Americans,
11 surveyors, oral histories, documentaries, evidence, any of
12 that material I tried to quote in relation to that.

13 Q. Well, in regard to that, can you point out which
14 portions, then, are you referring to specifically in
15 characterizing it that way?

16 A. For the most part, the area pertaining to from
17 the Salt River down to Painted Rock Dam.

18 Q. And can you tell me why there would be irrigation
19 diversions on a dry river?

20 A. Irrigation versus the course of the water, where
21 I referenced that, to the 1880s to 1890s and certainly the
22 Gila River is --

23 Q. So in that regard, in the 1890s, then, it was
24 your opinion that there was water in the river and that's
25 why the -- there was irrigation diversions, or what are

1 you saying?

2 A. I think there was -- there was probably water and
3 I think there's accounts of it. So in 1950 photographs of
4 the floods -- of course there are some during floods, but
5 there are diversions in the river upstream, yes.

6 Q. And a couple of other questions, Mr. August. I
7 wanted to get one clarification. In your opinion, is it
8 unreasonable when the -- I'm looking at page 25 of your
9 report. You discuss the railroad systems -- is it
10 unreasonable in your opinion for settlers or people in the
11 Valley at that time to have used the railroads when they
12 were available rather than the river?

13 A. Let me find -- where are we here?

14 Q. I said page 25.

15 A. Sure.

16 Q. I only had a brief period of time to look at it.
17 But based on that, I'm just saying, if there is
18 alternative transportation available other than the river
19 itself, do you think it unreasonable that people would
20 have used that who lived there rather than the river to
21 get from point A to point B?

22 A. I think the railroads were the preferred mode of
23 transportation at that time, particularly in the mining
24 districts, to get you in and out.

25 Q. Just give me a second. One other thing.

1 On page 20 of your report, footnote 32, you
2 reference a table. I didn't see -- at least the copy I
3 have doesn't have any table list attached to it that you
4 reference it, it's in your footnote. Was it your
5 intention to attach the table to it?

6 A. It was my intention, yes.

7 Q. Are there other exhibits or other information you
8 were intending to attach that aren't supplied?

9 A. I think some tables and photographs, yes.

10 Q. Are those going to be made available or are we
11 just going to limit it to what's in the report as is
12 stated or -- I just would like clarification on that.

13 A. I think we're going to submit --

14 MS. COPELAND: Your Honor -- Mr. Chairman --
15 Kirsten Copeland. I don't want to reopen that whole can
16 of worms. If the commission is going to take the position
17 that that would be new evidence, that would be excluded
18 and we'll leave the report as it stands.

19 CHAIRMAN EISENHOWER: Yes.

20 MS. COPELAND: The table was inadvertently
21 omitted. But we'll leave that up to the commission to
22 take it up.

23 MS. HACHTEL: I just wanted to state that it
24 wasn't there and wanted to know whether to expect it or
25 not.

1 DR. AUGUST: There was that discussion
2 earlier.

3 MS. HACHTEL: So I'll leave that to you.
4 I'm not -- I think that has been plenty of discussion on
5 that for you guys to decide, but that is the extent of my
6 questions.

7 CHAIRMAN EISENHOWER: Okay. Thank you.

8 MS. COPELAND: Kirsten Copeland again with
9 my still one question.

10 Mr. Helm made the comment in his examination
11 that what you were dealing with over a period of time he
12 characterized as snapshots, and as I recall, you agreed
13 that that was probably a pretty accurate description of
14 what this was. Did any of these snapshots that you
15 reviewed in the course of your investigation -- did any of
16 those snapshots give any indication that the Gila was in
17 fact navigable?

18 DR. AUGUST: Navigable or perennial, no.

19 MS. COPELAND: That's it.

20 CHAIRMAN EISENHOWER: Thank you.

21 We have a bunch of other people, but there
22 was one gentleman who made of point of wanting to
23 come before us, and I assume his presentation will be
24 short. He's a senior biologist with the Arizona Game and
25 Fish Department. Mr. Dave Weedman, if you would come

1 forward right now and make your presentation.

2 MR. WEEDMAN: Thank you, Mr. Chairman, board
3 commissioners. You're stretching it by saying senior
4 biologist. I am a biologist for the department. I have
5 been there 14 years. My training and experience has been
6 as a fishery biologist stationed out of our Mesa regional
7 office in central Arizona.

8 I have had the opportunity over the years to
9 work on lot of rivers around the state. But I'm here
10 mostly to discuss the Verde -- and I know this is not the
11 Verde hearing, that will come later -- but I do have a
12 couple of things I do want to say also about the Gila
13 River. And I do have, in my training and experience, some
14 familiarity with the history of the fish community of Gila
15 River. I want to talk a little bit about that and then --
16 a lot of what I say about the Gila also extends up to the
17 Verde through most of the historic time, the fish present
18 in parts of the Gila had access to and occupied the Verde
19 river, so my comments, I hope it's possible to take them
20 into account on both.

21 CHAIRMAN EISENHOWER: Okay.

22 MR. WEEDMAN: The Gila River historically
23 was occupied by a large body native species of fish,
24 primarily Colorado pikeminnow, also called the salmon in
25 old terms; razorback sucker, also known as a buffalo fish,

1 and several large species of other named suckers, many of
2 which reach five, six pounds. Pikeminnow have the
3 potential to reach up to a hundred pounds in larger
4 habitats such as the lower Gila. So there were fish
5 present historically in the river that were available, and
6 I think in a lot of the reports -- it's documented that
7 they were used by Native Americans as protein sources.
8 That being said, I've had the opportunity to boat, not
9 only the Gila River below San Carlos during fishery
10 surveys, but also the Verde River. I haven't done any
11 firsthand on the lower Gila from, say, below Painted Rock
12 down to the Colorado River, but I know it has been done
13 recently.

14 In preparing for this day, I did a little
15 bit of research -- and I say a little bit. One thing I do
16 want to say is I looked at the history of beaver trapping
17 along the Salt, the Verde, and the lower Gila. And
18 there's a fair amount of history there of frontiersmen
19 coming through in the mid-1800s -- and this is based on a
20 book by Goode P. Davis, Mr. August may be aware of it. I
21 found it really interesting to read. But in that book, he
22 talks about James Ohio Pattie and some of his excursions
23 out here and some others and canoeing the Gila River,
24 trapping beavers, and having to build additional dug out
25 canoes to load those beavers into, the skins, to try and

1 transport them down to Yuma.

2 In reading the book, it's interesting they
3 ran into a problem with Native Americans and also the
4 Mexican government and they wound up having to bury their
5 beaver pelts prior to finishing their journey, so they
6 never got those things to market. But the history of
7 beaver trapping was a commercial activity in the mid- to
8 late 1800s. The fallout -- or the decline of that
9 commercial activity was mostly related to markets in the
10 east. It wasn't that the river became unboatable, it
11 wasn't that beavers disappeared, it was the fact that it
12 was no long profitable to trap beavers and ship them back
13 east; the price had crashed. And that I -- I present
14 secondhand information, I know, but I provide a citation
15 in the book. Over the years I've done probably no less
16 than at least 11, possibly 12 canoe trips down the Verde
17 River doing fishery surveys. I have a personal question,
18 and I don't know if this is not a place to have it
19 answered, but the definition of navigability, there is a
20 wide range of things that aren't discussed in the
21 definition that's provided in the reports and that you
22 guys are working from. And that is a period of time and
23 whether or not it was navigable at that time of statehood
24 under those conditions or current boating standards. Had
25 they been applied and those equipment available at that

1 time. That's just an unknown that I have, and not being a
2 lawyer, that's just a question I have. But to me, I
3 boated the Verde River in probably the lowest flows, 75 to
4 80 cubic feet per second, in the dead of summer. When
5 most people would assume it's not boatable, but with a
6 canoe and a little bit of effort, it certainly is. So the
7 chairman said I would be brief and that's about all I have
8 to say at this point. I do appreciate the opportunity to
9 come and -- poorly, admittedly -- represent the Game and
10 Fish Department. I wish I had days and weeks to prepare
11 and develop evidence and bring it, but unfortunately I
12 didn't.

13 At this point, I would be happy to answer
14 any questions anybody might have regarding historic
15 department activities I may have information to or fish.

16 (Mr. Weedman is answering questions.)

17 BY COMMISSIONER BRASHEAR:

18 Q. Is beaver trapping in that operation were they
19 skinned the thing and they took them -- what time period
20 did that occur in and where on the river?

21 A. As I was reading this book, I should have wrote
22 the dates down. It was approximately 1840 to 1860, give
23 or take 10 years on either side. Mr. August might be able
24 to provide accurate dates or maybe another historian could
25 provide those. I asked several of our older and more

1 senior game biologists in our department that deal with
2 beaver and they weren't aware of written reports within
3 our department records on beaver trapping. Most of you
4 are aware that department didn't really come into
5 existence until after the -- statehood, so they had mostly
6 no --

7 Q. You reported to us this place; where did you
8 learn of this?

9 A. In a book that I was reviewing. It was a
10 historical account of wildlife populations in the Arizona
11 territories prior to statehood. And the author of the
12 book is Goode P. Davis, and apologize again, I don't know
13 the title of the book, but it was a master's work, I
14 believe, out of ASU.

15 CHAIRMAN EISENHOWER: Mr. Jennings?

16 (Mr. Weedman is answering questions.)

17 BY COMMISSION COUNSEL JENNINGS:

18 Q. One quick question.

19 In your research and just generally being
20 familiar with the Verde, the Gila, and the other rivers of
21 Arizona, are you aware of any commercial fishing activity
22 or endeavor that took place near statehood, around 1912,
23 that is where fish would be caught for commercial purposes
24 and sold to either processors or restaurants or thing of
25 that nature?

1 A. There's references of harvested fish and
2 transport to mining towns near San Pedro, Tombstone; in
3 that area of large body, fish become harvested out of the
4 river and transported to feed the miners. In Tombstone
5 and that area, and those would have been harvested out of
6 San Pedro.

7 Q. That would have been around Tombstone, 1880 to
8 1888?

9 A. Correct.

10 Q. But that's the only one that you know of?

11 A. The only one prior to statehood. There has been
12 reports or studies done on susceptibility of commercial
13 fisheries being established on some of our now current
14 reservoirs, but those, of course, were post-dated
15 statehood.

16 COMMISSION COUNSEL JENNINGS: Thank you.

17 MR. WEEDMAN: Thank you.

18 CHAIRMAN EISENHOWER: Is there anybody in
19 the audience that would like to ask questions of
20 Mr. Weedman?

21 Yes, Mr. Sparks.

22 (Mr. Weedman is answering questions.)

23 BY MR. SPARKS:

24 Q. Mr. Chairman, members of the commission, my name
25 is Joe Sparks. On this part of the report, I'm going to

1 ask questions on the behalf of Yavapai Apache Nation and
2 San Carlos Apache tribe.

3 In your reading of the beaver trappings,
4 what portion of the Gila River were you referring to
5 specifically?

6 A. The portion that James Ohio Pattie traversed on
7 several occasions, several different trapping excursions,
8 was approximately the area from Safford all the way to the
9 confluence of the Colorado.

10 Q. And what period of time would that have been?

11 A. It would have been the mid- to late 1800s, 1840,
12 1850 to about 1860 or 1870.

13 Q. So that would be have been before Geronimo was
14 captured and during Mangus-Colorado and the Chiricahua
15 Apaches while they were active and in their homelands?

16 A. My limited understanding of history, I would have
17 known all this back in high school. I'm an Arizona
18 resident.

19 Q. Is the answer you don't know?

20 A. I don't know. I suspect that they were still
21 active at that time.

22 Q. So you think it's likely that they would have
23 been making regular trips into Apache country and trapping
24 beavers during that period?

25 A. I think it's possible.

1 Q. I'm not asking you to speculate. I'm asking you
2 if you know.

3 A. No, sir, I don't know.

4 Q. The second question I would like to ask you is,
5 when you have, yourself, experienced boating on the Verde
6 River, what portion of the Verde did you use your canoe
7 on?

8 A. I have canoed from the Childs powerplant down to
9 an area called Sheep Bridge just above Horseshoe
10 Reservoir, 11 or 12 times. I also canoed from Beasley
11 Flats down to Childs twice.

12 Q. And the Sheep Bridge is at Rock Creek -- Red
13 Creek in the Verde?

14 A. Red Creek is about 10 miles above Sheep Bridge;
15 Tangle Creek would be a closer confluence to the Verde.

16 Q. And then the area you began on the Verde was at
17 the base of what is known as the Verde Valley or Camp
18 Verde is located?

19 A. A few miles below, yes.

20 Q. But not upstream from that?

21 A. Not upstream from the town of Camp Verde.

22 MR. SPARKS: Thank you.

23 CHAIRMAN EISENHOWER: Anybody else have
24 questions?

25 MR. HELM: John Helm for Maricopa County.

1 Members of the commission.

2 (Mr. Weedman is answering questions.)

3 BY MR. HELM:

4 Q. Mr. Weedman, you talk about large-bodied fish,
5 can you give a sense of what we're talking about in terms
6 of size?

7 A. The term large-bodied fish is a fish that is able
8 to grow larger than 12 to 18 inches.

9 Q. How big do these things grow?

10 A. Pikeminnow, up to 6 feet long potentially in
11 suitable habitats, and weighing a hundred pounds. And
12 then razorback sucker, approaching 36 inches and weighing
13 up to about 10 pounds.

14 Q. Okay.

15 A. Heather sucker, eight to ten pounds.

16 Q. How much water would a fish that is a hundred
17 pounds need to survive in a normal habitat? Like -- what
18 did you call it?

19 A. Pikeminnow?

20 Q. Pikeminnow.

21 A. To reach that size, he's going to need a habitat
22 with large pools similar to the mainstem Colorado River.
23 The Colorado pikeminnow got its name -- it was commonly
24 called salmon, historically it was a white salmon, and
25 they're known to migrate hundreds of miles, and it would

1 not have been unusual for a large-bodied fish to migrate
2 out of the Colorado River where it spends part of its time
3 upstream into the Gila or spawning activity in the
4 springtime. That's also historically the time when the
5 rivers have the most water from snow melt and would be
6 connected on good years.

7 Q. Would they get by in six inches of water?

8 A. They could, yes, sir.

9 Q. For long periods of time?

10 A. They can traverse areas of six inches of water if
11 they were landlocked; trapped in area of six inches of
12 water, especially in the desert areas, I suspect they
13 would have died either due to heat, stress, or have been
14 preyed upon by other animals.

15 Q. In terms of depth, what would be the ideal but
16 normal depth, ordinary depth that you find those
17 pikeminnows in?

18 A. I would say deeper than three feet. Certainly if
19 they traverse shallower areas, find an area below a dam.

20 Q. Did you testify -- I thought you did -- that you
21 have also boated on the Gila?

22 A. Yes, sir. Once had an opportunity to go from the
23 base of San Carlos reservoir down to Winkleman doing a
24 fish survey.

25 Q. Would the same kinds of CFS to canoe on the Verde

1 apply to the Gila River? In other words, would 70 or
2 80 feet per second be enough for you to canoe on the Gila?

3 A. It depends on the channel morphology. In that
4 area of the Gila, because it's in a narrowly-defined
5 channel, I would say yes, that would be enough. I
6 wouldn't be able go continuously, I would have to stop and
7 drag my canoe over sandbars and other obstacles, but I can
8 certainly go downstream.

9 Now, in those areas of the Gila where the
10 floodplain is wider and is more spread out, I would say
11 it's probably not an enviable proposition.

12 Q. Would you estimate in those areas you would need
13 to carry on or don't you know?

14 A. I don't even want to speculate.

15 MR. HELM: That's all I have. Thank you.

16 CHAIRMAN EISENHOWER: Is there anybody else
17 that has any questions for Mr. Weedman?

18 Hearing none, thank you, Mr. Weedman, for
19 coming in, appreciate it.

20 MS. HACHTEL: Mr. Chairman, I just want to
21 follow up on one thing based on Mr. Weedman's testimony.
22 From I understand, he's not available tomorrow so is his
23 testimony as well for the Verde? Is there some
24 arrangement we can make as far as having this transcript
25 on the Gila designated to include that in the Verde

1 evidence, as far as his testimony?

2 CHAIRMAN EISENHOWER: We can duplicate his
3 responses for both rivers.

4 MS. HACHTEL: Thank you.

5 EXECUTIVE DIRECTOR MEHNERT: Mr. Chairman, I
6 suspect we're going to have a single transcript, aren't
7 we, or are we going to do different transcripts?

8 (An off-the-record discussion ensued.)

9 CHAIRMAN EISENHOWER: What I am trying to do
10 is sort through some of these to get out of the way.

11 I have several speaker requests here, and
12 not knowing who some of those people may be, I will call
13 your name, and if you're with somebody else or are an
14 expert witness for somebody, please let me know because it
15 doesn't say on my request form.

16 Donald C. Jackson?

17 MR. JACKSON: Yes, sir.

18 CHAIRMAN EISENHOWER: Yes.

19 MR. JACKSON: For Maricopa County.

20 CHAIRMAN EISENHOWER: Okay.

21 MR. JACKSON: I thought I noted that.

22 CHAIRMAN EISENHOWER: No, you didn't. Thank
23 you very much.

24 Jim Fuller?

25 MR. FULLER: John Fuller.

1 CHAIRMAN EISENHOWER: We know who you are.

2 MR. FULLER: No, I don't want to testify.

3 CHAIRMAN EISENHOWER: Bill Staudenmaier?

4 MR. STAUDENMAIER: Mr. Chairman, I did not
5 plan to speak or present a witness. I just submitted a
6 card in case I needed to cross-examine someone.

7 CHAIRMAN EISENHOWER: Thank you.

8 Mr. Helm, you said Wynn Hjalmarson --

9 MR. HELM: That's correct.

10 CHAIRMAN EISENHOWER: -- is one of your
11 expert witnesses?

12 MR. HELM: We call him Wynn.

13 CHAIRMAN EISENHOWER: Okay. I think I've
14 covered everybody who is associated with somebody except
15 Mr. Allen Gookin.

16 MR. GOOKIN: Gila River Indian Reservation.

17 CHAIRMAN EISENHOWER: Would you come
18 forward, please?

19 MR. GOOKIN: Certainly.

20 My name is Allen Gookin, I'm a civil
21 engineer, professional hydrologist and the land surveyor.
22 I work for the Gila River Indian Reservation, and god, I
23 hope I'm being paid.

24 I have a prewritten presentation that I
25 pretty much presented before, and so I just thought I

1 would hand that out and save you having to listen to it.
2 But some issues have come out in this hearing that I would
3 like to talk about, because I do think I have a unique
4 background to contribute.

5 My firm has worked with the Gila River
6 Indians since 1968, and I was just a senior in high school
7 then. So I personally haven't done it, but that was my
8 first job on joining my father's firm and I've worked
9 pretty much with him off and on every since. As such, I
10 know a lot of history of the Gila River Indian
11 Reservation. I worked with Hank Dobbins, Richard Atkins,
12 and other historians in learning what's happened where,
13 when, and why. There are a couple of points I want to
14 make.

15 First, regarding the ownership of the
16 riverbed -- and I'm primarily talking about the river on
17 the reservation, that's what we're worried about. The
18 federal government, prior to 1912, gave that ownership to
19 the Gila River Indian Reservation, or we prefer to say
20 they acknowledged the Pima Maricopa's prior ownership. We
21 have submitted into the record the executive orders that
22 talk about it going -- it happened in two stages, there
23 was a -- if you're looking downstream, a right side and a
24 left side. The right side occurred in 1879 and it took
25 the border to the middle the Gila River. The left side

1 occurred in 1882 and it took the border to middle of the
2 Gila River. If you come to the middle from both sides,
3 you're pretty much there, and so we believe that the
4 ownership of that bed was given prior to statehood.

5 The Pima Maricopa confederation occupied
6 this area for quite a while. It depends on who you ask,
7 Maricopa comes up with 1700, the Pimas were there from at
8 least the 1600s and probably are the descendants of the
9 Hohokam, depends on who you ask. There's a lot of
10 scholarly debate concerning that subject. I know the
11 Pimas believe they are the descendants.

12 The Pimas used the river for their own
13 purposes, and that purpose was primarily irrigation and
14 drinking water. And they took advantage of the geology of
15 the river, and I want to talk a little bit about that.

16 It's been mentioned in passing before, but
17 as the river comes down, it seeps into the riverbed in
18 spots where the riverbed is wide feet and then comes back
19 and narrows where the bedrocks narrow and it's kind of
20 like it's trying to go through a funnel, and it's got a
21 little spot it can pop out and it will pop out at that
22 point. Now, my attorney screwed it all up in the
23 cross-examination, but you all know John Hestand so I
24 think you understand that. When he asked Mr. Huckleberry
25 about the Shoshone, well, he hasn't learned that Shoshone

1 is plural and he was asking about one Shone. In Pima,
2 they repeat the first syllable in order to make a word
3 plural. That's why the Hohokam is people rather than
4 person. Hohokam is a Pima word, by the way.

5 The Shoshone -- and there are a bunch on the
6 reservation -- created the river coming up, and that's
7 where they put their primary diversion points because that
8 was where the water was dependable. Other areas, you
9 might only get a little bit at a time or you would get a
10 lot.

11 Now, the historians have talked a lot about
12 the absence of evidence is not evidence of absence. And
13 that is a phrase I have had historians tell me all through
14 my professional life. But one thing that should be
15 recognized here, that phrase usually refers some place
16 where people haven't been to find out and make evidence.
17 For example, the question that has been debated in my
18 professional life, were people up on the Salt River before
19 the non-Indians came. You could care less, I know, but to
20 some people that's important. And the Salt River, the
21 explorers all went down the Gila and then over. So nobody
22 went up there. In that case, the absence of evidence --
23 because nobody went there -- is not evidence of absence.
24 We don't know what was going on the Salt in prehistoric
25 time. We do know what was going with the Gila. There

1 were military expeditions, Jesuits, conquistadors.
2 Mr. August had made a pretty detailed description of a lot
3 of them -- I won't go through them -- but one thing he did
4 mention, these people were bored, and they wrote extensive
5 diaries, incredible detail, because, I guess, they had
6 nothing better to do. I don't know why. Probably because
7 they were trying to put messages back to the eastern
8 people, what it was really like out here. They talked
9 about how they farmed, where the canals were, how the
10 women would carry the loads of driftwood by having two
11 stakes on their back, and they would be bent over and they
12 have all the wood and a Pima man would just be sitting
13 there talking about how lazy the women were. They had a
14 good system, by the way.

15 Sorry.

16 COMMISSIONER ECHEVERRIA: The more things
17 change, the more they stay the same.

18 MR. GOOKIN: The point is that when you have
19 this level of detail of reporting, none of them mention
20 boats, none of them mention canoes. The Akimel Au-Authm
21 are the river people. They live on the river. They are
22 also big traders. And they had a confederation of Pimas
23 lived up kind of where the reservation is now, the
24 Maricopas lived down where the Buckeye, Arlington
25 irrigation districts are now and they traded, but they

1 didn't do it on the river. They took their goods and they
2 ran to each other.

3 Now, I'm a softie, I admit it. But if I had
4 a choice between a boat ride going down river to take the
5 stuff or running in July with a bale of wheat on my back,
6 it would be a real quick pick for me, and they didn't do
7 it.

8 Now, we know that the Pimas were
9 technologically advanced for the time. You saw the
10 picture of how the Sacaton Dam had washed out, the brush
11 dam, and they were rebuilding. They knew how to work
12 wood. They would cut the cottonwoods and they would stick
13 them into the soil. They would take the mesquite trees
14 and they'd cut the branches and they would interweave them
15 to make the brush diversion dams. They had lots of
16 mesquite that grew much higher than mesquite does today
17 because they had a good groundwater source. They had
18 beautiful cottonwoods until the BIA made them tear them
19 out. They could -- they had wood available to build boats
20 or rafts, they knew how to work with wood, and yet they
21 didn't bother to make boats. To me, that tells me a lot.

22 But in addition to the non-Indian
23 transcripts, as it were, the Indians kept records also.
24 The Pimas did. They did what were called calendar sticks.
25 Frank Russell did an extensive study on the Pima Indians

1 in which he interviewed a lot of the elders. This is back
2 in about 1910 -- 1900 when he was interviewing the old
3 Indians then and went through the calendar sticks with
4 them, and he makes no mention about boats. He talks about
5 the tools. He talks about what they ate. He talks about
6 their holidays. He talks about their drinking. They
7 would drink once a year -- I don't know how they got away
8 with that -- but they went through excruciating detail on
9 all their lifestyle, no boats. I don't think the absence
10 of evidence in this case is the same thing as what's being
11 talked about.

12 Now historically, moving to the more modern
13 period, there are a couple of things that I would like to
14 point out. One, in the State Land Department report, they
15 have presented studies on the depth of water at river
16 gauges. And I'm sure they're done properly, but one thing
17 to be aware of a river gauge -- a river gauge is
18 deliberately selected to be at a point where the river is
19 narrow and carefully defined. Because the way you measure
20 a river is you just have something that measures the depth
21 of the water. From that depth of water, you have to be
22 able to determine what the flow was, which means you want
23 a stable channel that's well-defined.

24 You won't put it out where the braiding --
25 it may flow here one day, here the next, here the third.

1 So the gauges are a deliberately -- unrelated to this
2 hearing -- distorted sample of what was going on in the
3 river as far as depths of water go.

4 Second, in the list of trips, I would like
5 to point out that with one expectation of the 1909 trip,
6 which we know very little about, none of them went through
7 the Gila River Indian Reservation. They went down to
8 Sacaton, they picked up their boats, and they went
9 cross-country up to the Salt River. That would be a long
10 hike with a boat on your back. They started at Maricopa
11 Wells, that's down at the confluence of the Salt and Gila,
12 and they went downstream from there, whether or not they
13 made it kind of verify.

14 The third point I would like to make, that
15 Mr. Fuller, I believe, pointed out, but I would like to
16 emphasize it, and that is there is a big difference
17 between mean average flow and the median flow. For
18 example, in one of his charts, he showed the gauge at
19 Laveen. The median flow for the gauge at Laveen -- that
20 means 50 percent of the time it's more, 50 percent of the
21 time it's less, was zero CFS. It has an average flow that
22 is greater than zero CFS. Average in hydrology is so
23 badly distorted by flood flows that it's kind of like Bill
24 Gates walking in this room and our average income
25 immediately triples because he's rich. Well, the same

1 thing with the water. You've got to look at the median
2 flows to get anything resembling a typical flow.

3 On the dams that are -- that were built back
4 then -- there has been a lot of discussion about
5 diversions and the effect of flows. During low flows, the
6 non-Indian diversions and the Indian diversions did take
7 all the water during low tides. During the floods, they
8 washed out. The dams that were there in 1912 and prior
9 were not like the dams that are there today. Now they're
10 concrete, and they are built to stay year-round. Back
11 then, they didn't have the concrete structures. Instead
12 they built brush dams. The non-Indians learned how to do
13 it from the Pimas who figured it out. And during a flood,
14 just like that picture showed, they would be running out
15 there in floodwater building the dam as fast as they can
16 so they could get more water onto their fields during the
17 flood. So in terms of the geomorphology, the dams would
18 not have had much impact because they didn't really impact
19 the flood flows much. They did impact the low flows. And
20 I thought that was something that should be brought up.

21 Finally, we know that the Gila was dry in
22 several reaches on the reservation by 1912. We know that
23 from 1896 to 1905 there's a period called the starving
24 decade, where the Pimas were literally dying from famine
25 because there was no water for them to divert to put on

1 their fields. The history of the reservation -- and we
2 have introduced evidence on this effect -- was primarily
3 driven by the federal government's attempt to get more
4 water for the Pimas. They kept expanding the reservation
5 to pick up the Shones or occasionally the Shoshones and
6 get additional water supplies. So we know that the Gila
7 River had dry spots throughout. And that's about all I
8 have to add.

9 (Mr. Gookin is answering questions.)

10 BY COMMISSIONER BRASHEAR:

11 Q. One of the things is your observation about Bill
12 Gates. I think if he walked in here, is that you must
13 have a tremendous, lofty schedule, because I think that
14 would be worth about a billion dollars to each of us, 39
15 billion I think is his worth. But in any event, you've
16 made two arguments. One is that the river was not
17 navigable. But then you made the argument that even if it
18 was or is, if it was the Mississippi flowing through
19 there, it would -- the State of Arizona would have no
20 claim to it because that land had been assigned to the
21 tribe and it would not be navigable even if you could sail
22 a Nimitz-class cruiser down the --

23 A. Quite right. We believe that the title was
24 explicitly passed by the federal government to the Gila
25 River Indian reservation. We also believe -- I'm sorry,

1 John, I know you're getting upset when I say it that
2 way -- but the government confirmed our title that we had
3 since time and aboriginal, and then there's quite a bit of
4 difference that lawyers can have a lot. But the
5 descriptions clearly, in both cases, went to the middle of
6 the Gila River from opposite sides.

7 Q. So the reason I'm asking is our counsel has
8 discussed several times about the case on that. The
9 Custer battlefield, the road -- it goes -- go through
10 there and that was deemed navigable, and the Indian tribe
11 lost on that one.

12 MR. HESTAND: With the commission's
13 permission. I got caught flatfooted -- and I apologize --
14 during your Pima County/Pinal County hearing and I was
15 asked about Montana versus United States. And I hadn't
16 looked at Montana versus United States for months. And I
17 was thinking of going, "Okay, I know it doesn't apply,"
18 but I was a little vague on why it doesn't apply. So I
19 immediately went back to my office and checked and
20 determined that indeed it does not apply in this
21 particular case.

22 Montana versus United States involved an
23 Indian reservation in which the Indians were nomadic
24 hunters and had never relied upon the river. They hadn't
25 used it for fishing, they hadn't used it for farming, they

1 hadn't used it for any reason. And in that study, the
2 United States Supreme Court said that when their
3 reservation was created, that the federal government had
4 not intended to transfer to them the underlying riverbed.

5 Now, we have a distinction there -- a
6 tremendous distinction that the U.S. Supreme Court really,
7 really nailed down, 20 years later, in Idaho versus United
8 States; the cite for it is 533 U.S. 260. 533 U.S. 260 and
9 was in 2001. And this case involved an Indian reservation
10 in which the Indians had relied upon fish as a major part
11 of their sustenance. Now, as is the case with Indian
12 reservations, they were given a big reservation and it
13 was -- parts of it were taken away, and parts of it were
14 taken, parts of it were taken away until finally they had
15 a third of a lake and part of the river. In their
16 original reservation, they had all the lake and most of
17 the river. But the United States Supreme Court determined
18 that for that part that they had still had, they, not the
19 State, owned the bed of the lake or the portion of the
20 reservation and the bed of the river that was on the
21 reservation. And because that was in essence part of the
22 function of the reservation, that that went to them and
23 was not held for the state for statehood. And as -- even
24 Mr. Helm has acknowledged clearly the federal government
25 can make the decision to take land that it was going to

1 hold for the state and use it for its own purposes. And
2 that can be for any public purpose. Well, in the case of
3 the Gila River Indian community, the Gila River Indian
4 Reservation, we have two different reasons that the State
5 of Arizona has no ownership interest in this land in any
6 way, shape, or form.

7 The first is the principle of Idaho versus
8 United States.

9 COMMISSIONER ECHEVERRIA: Is that the
10 Owagee?

11 MR. HESTAND: Beg your pardon?

12 COMMISSIONER ECHEVERRIA: The Owagee River?

13 MR. HESTAND: I will check and see.

14 St. John River -- or St. Joe River. In the
15 case of the Gila River Indian community, the Gila -- the
16 Pima Maricopa confederation were pastoral
17 agriculturalists. They lived in a set area. Now the
18 aboriginal territory was quite large, about 20 times
19 larger than the current reservation. But they lived along
20 the river where they farmed. And they used the river.
21 They would block a 100 percent of the flow of river at
22 low-flow, as Mr. Gookin testified. Then allow the water
23 to flow back into the river with their tail water. They
24 used these dams in the river to get the water to their
25 crops. Clearly they had to own the river bed in order to

1 live and the United States government intended for them to
2 continue their agrarian lifestyle. And that can only be
3 done if they owned that land, because if the State owned
4 that land, the State could go, "You can't build a
5 diversion facility there." And then they couldn't do what
6 the federal government intended for them to do.

7 And it's important to recognize that when
8 you're dealing with the Pima Maricopa Indian community,
9 that you take all the cases about the fact that you're
10 supposed to interpret things in favor of Indians,
11 treaties, and things of that nature, you to multiply that
12 by 20 because the Pima Maricopas were never the enemies of
13 the United States. They never fought with the United
14 States. As a matter of fact, they took a great deal of
15 pride that they did not know the color of a white man's
16 blood. Instead they defended the Euro-American settlers
17 when they came in from other Indian tribes that were
18 hostile. They had joint military operations with the
19 United States Army. And one of the things for all the
20 expansions of the reservation, they talked about how loyal
21 these Indians were, how dedicated they were to the United
22 States government. And their intent clearly was to give
23 them everything that was once theirs.

24 Now having said that, we go to a separate,
25 distinct, and independent issue, is our title says we own

1 it. Setting aside the United States Supreme Court, when
2 the United States set aside the reservation confirming the
3 average territory of the Pima Maricopa, the deed said "to
4 the middle of the river -- to the middle of the river."
5 This was done before statehood and clearly the federal
6 government could do that for their purposes. So from that
7 standpoint, no matter what you decide on navigability --
8 and I suspect from the evidence you're going to determine
9 it was non-navigable -- but even if you determine that
10 that stretch was navigable, it can have no impact on the
11 ownership of the stream bed.

12 Thank you for being so patient with me. Are
13 there any questions I could answer?

14 MR. GOOKIN: And I think you learn the
15 problem with that is asking a question for an attorney.

16 I would say -- like to point out one thing
17 that he mentioned. Mr. Brashear, you talked about the
18 surveys that were done back -- The surveys on the middle
19 Gila and on the lower Gila, the upper portions of it, like
20 Painted Rock Dam and so forth, wouldn't have been done
21 under the protection of the Pima Maricopas, who did assert
22 military sovereignty over the area and did protect the
23 white man in the area. So that -- whether or not they
24 defrauded the government for personal reasons, fear of the
25 Indians wasn't one of them.

1 CHAIRMAN EISENHOWER: Is there any questions
2 for Mr. Gookin?

3 (An off-the-record discussion ensued.)

4 (Mr. Gookin is answering questions.)

5 BY MS. HACHTEL:

6 Q. Laurie Hachtel for the Arizona State Land
7 Department. Mr. Gookin, I have a couple of questions for
8 you.

9 You opined earlier in your testimony that
10 the land department rating curve -- USGS rating curves
11 cross-sections weren't representative, and I just wanted
12 to find out, do you have any cross-sections of your own
13 that you're offering here today?

14 A. No.

15 Q. And also you noted that the gauge data at the
16 USGS gauge at Laveen, that had a marked difference between
17 the average and median flow rate?

18 A. I believe so, yes.

19 Q. And then, can you tell me what time period was
20 represented by the data?

21 A. It wasn't up there long enough for me to say, I'm
22 sorry. I got the median. I got the mean. And I thought,
23 "That's a good example."

24 Q. And -- okay. And would you say that that data
25 was affected by diversions?

1 A. Yes.

2 Q. And dams, to that extent?

3 A. Probably.

4 Q. And just a couple of other quick questions. Are
5 you a geomorphologist?

6 A. No.

7 Q. And do you have any expertise in geomorphology?

8 A. Yes.

9 Q. And what would that be?

10 A. I've worked on river movement cases historically
11 on numerous occasions and that involves the geomorphology
12 of the river. Part of being a hydrologist is you've got
13 to learn something about it.

14 Q. In those cases, were you retained as a
15 hydrologist or to do geomorphology?

16 A. I was retained to testify concerning river
17 movement, so it would be both.

18 Q. But have you had any -- have you had any special
19 training in geomorphology?

20 A. I did take a 2-week class up at the University of
21 Colorado and that's it, plus what my father taught me.

22 Q. And when was that class that you took?

23 A. 1980, give or take.

24 Q. And what is the basis of your opinion that
25 diversions would have no impact on channel conditions?

1 A. I said "little impact."

2 Q. "Little"?

3 A. The fact is that the diversion at that time,
4 that's a critical difference, if the dam is going to
5 sustain itself through the flood, in order to -- if you're
6 talking about a storage dam, like Coolidge or something,
7 then it can have a big impact. But if dam is going to
8 wash out during the flood flow, then -- like brush dams
9 did. And that was well-known back in that period that
10 this was going to happen. It was expected and they would
11 get right out there and rebuild it. There was a lot of
12 documentation to that effect that that's what they did.
13 Then they're not going to have a big impact because they
14 are not there during the flood. And as Mr. Huckleberry, I
15 believe, testified -- and I agree -- probably the most
16 important things to change in river channels and so forth
17 is the flood flows. That's creating the big movements or
18 changes in characteristics. Otherwise, you get more of
19 the off -- the slow and free-type movements that have
20 different legal ownership.

21 Q. But after floods, generally, Mr. Gookin, don't
22 rivers tend to get back to some type of ordinary condition
23 or preflood condition?

24 A. They get back to a new ordinary position.

25 Q. But they do resume something, whether it's that

1 existing channel or a different channel, they do get back
2 into some nonflood arrangement?

3 A. Yes.

4 MS. HACHTEL: No more questions. Thank you.

5 CHAIRMAN EISENHOWER: Thank you.

6 Are there any further questions?

7 MR. HELM: I think I'm dealing with two
8 witnesses. Mr. Upton in the middle of the presentation --

9 MR. HESTAND: Hestand.

10 MR. HELM: I'm sorry. Hestand. I thought
11 it was Upton, I apologize.

12 You gave a dissertation on the navigability
13 of prestatehood streams as it relates to Indian law.

14 MR. HESTAND: Actually, I object. I did not
15 talk about that. I talked about ownership.

16 CHAIRMAN EISENHOWER: Would you come up to
17 the podium, please?

18 MR. HESTAND: Yes.

19 That misstates my statement. My statement
20 was not testimony. My statement was legal argument in
21 response to a very legitimate question that the commission
22 had. And it dealt with not navigability. Because on that
23 issue, quite frankly, we don't give a darn. Navigable,
24 non-navigable, it doesn't matter. Because before it
25 became the State of Arizona, the United States government

1 confirmed that that riverbed belonged to the Pima Maricopa
2 Indian community. And so I wasn't testifying about
3 navigability because it doesn't matter.

4 (Mr. Gookin is answering questions.)

5 BY MR. HELM:

6 Q. I couldn't have said it any better. He's laid
7 the whole premise for what I wanted to tell you in
8 response to what he said. And that was to commend to you
9 the cases in the Cherokee-Choctaw series that ends up with
10 one in the Supreme Court. You've got a 10th Circuit case
11 and the Supreme Court reversing the 10th Circuit on the
12 basis that they disagreed with the facts, not that they
13 disagreed with the 10th Circuit's decision on the law.
14 And the 10th Circuit said that there had to be a specific
15 intent evidenced to transfer the lands, and in fact, said
16 that just a metes and bounds description wouldn't do it.

17 I'm not here to take issue with whether they
18 did -- "they" being the federal government -- transfer
19 lands to this Indian tribe. I just like to see that it's
20 done under the correct standard, and if they meet the
21 standard and show that there is a particularized intent to
22 transfer done by the federal government before statehood I
23 think that statement is absolutely right. If they just
24 got a deed that says, "Here's a metes and bounds
25 description. You get it." You need more than that and

1 the Cherokee case establishes that, and that's my only
2 point that you made in response to Mr. Hestand.

3 With respect to your testimony -- first of
4 all, you testified, I believe, that you're engineer, a
5 hydrologists, and a surveyor.

6 A. That's correct.

7 Q. Are you a registered surveyor?

8 A. Yes.

9 Q. In the State of Arizona?

10 A. Yes.

11 Q. And a registered civil engineer in the State of
12 Arizona?

13 A. Yes.

14 Q. What society are you with in terms of hydrology?

15 A. The American Institute of Hydrologists.

16 Q. Have you been trained -- classically trained,
17 whatever you want to call it, as a historian?

18 A. No.

19 Q. You don't claim to be a historian?

20 A. I believe that I have become a historian by basis
21 of 30 years' experience for this area, yes.

22 Q. So what you were testifying as it relates to
23 history was not in terms of a formal historian but what
24 you learned in the on-the-job training that you had over
25 30 years?

1 A. That's correct. I consider myself, at this point
2 in my life, to be a hydrologic historian.

3 Q. Have you published anything?

4 A. Yes, I have.

5 Q. On history?

6 A. Let me think. Subflow, some of it concerned --
7 yes. I just made a presentation concerning flows in the
8 Safford Valley during the 1940s and using the current
9 studies to create some new formula I'm relating to
10 surface-groundwater interactions.

11 Q. Is that a peer-reviewed periodical?

12 A. I don't think so. I don't think it's actually
13 published yet. I'm created -- no, I'm sorry, wait. They
14 gave me a copy, so it was published. I don't believe it
15 was peer reviewed.

16 Q. Okay. Have you ever written any books?

17 A. Not published -- I have written books.

18 Q. For you own amusement?

19 A. God, no. They would be expert reports.

20 Q. Now, the evidence that you present in terms of
21 the ownership of the portion of the Gila River that
22 relates to your Indian heritage, is that limited simply to
23 what you have filed with this commission? There isn't
24 anything else that is going to go into the record or
25 anything else that you are relying on?

1 A. And I wanted to amplify on that, thank you. We
2 have filed a pile of documents -- I didn't understand why
3 my attorney wanted me to talk or file excerpts out of my
4 report that I once prepared on the purpose of the Gila
5 River Indian Reservation. But he wanted it, so it's in
6 there. And yes, I do discuss -- and I will be happy to
7 discuss, ad nauseam, that it was the clear purpose of the
8 federal government and the military to expand the
9 reservation for irrigation purposes.

10 Q. If we were in courtroom, I would ask the judge to
11 instruct to you to be responsive to my question. What I
12 asked you was, is the evidence that you filed with the
13 commission all that you are relying on to support your
14 claim that the federal government transferred the portion
15 of the river flowing through your reservation to that
16 tribe prestatehood?

17 A. Yes.

18 Q. In your profession as a hydrologist slash
19 engineer, are the gauging records of the USGS and Bureau
20 of Reclamation generally accepted as being accurate?

21 A. No. You can't measure water accurately.

22 Q. I said within your profession, standard in the
23 community?

24 A. I'm sorry, I misunderstood.

25 Yes, they are the standard, that's what we

1 use, and that's what we've got.

2 Q. What you design to?

3 A. It's what we design to, yes.

4 Q. You made a comment earlier about at -- or at
5 least I thought you did. I don't want to put words in
6 your mouth -- that around statehood, the Gila River in
7 your reservations area was dry?

8 A. Portions of the Gila River, yes.

9 Q. Do you know the cause for the drought?

10 A. Yes.

11 Q. Could it have been because of diversions
12 upstream?

13 A. Yes.

14 Q. Would that be the principal cause?

15 A. Yes.

16 Q. There was no cataclysmic geologic event or
17 anything that diverted the river off the reservation, or
18 anything like that?

19 A. There was a drought at the period right at the
20 turn of the century that brought the matter to a head.
21 The change in conditions other than the normal climatic
22 fluctuations was the diversions upstream.

23 Q. If you had -- if you hadn't had those diversions,
24 would you perceive that the water would have flowed
25 through your reservation?

1 A. I think it would have.

2 Q. Okay. At the time we're talking about, there had
3 been significant diversions of the Gila River taking
4 place?

5 A. Yes.

6 MR. HELM: I don't have any further
7 questions.

8 MR. GOOKIN: Let me clarify that. I assumed
9 the time you were talking about was 1912.

10 MR. HELM: Yes, when it was dry.

11 MR. GOOKIN: Yes.

12 CHAIRMAN EISENHOWER: Are there any other
13 questions for Mr. Gookin?

14 If not, then we thank Mr. Gookin for coming
15 forward.

16 MR. GOOKIN: Thank you.

17 CHAIRMAN EISENHOWER: I want to do just a
18 brief bit of housekeeping here. And as the hour is
19 getting late, it's almost 5 o'clock, it's very obvious
20 that we are going to have to continue tomorrow. But I
21 want to double-check my speaker sheets. And there's three
22 major groups of people here that -- other than specific
23 individuals. Mr. Helm, you have Roberta Livesay, Wynn
24 Hjalmarson, and Donald Jackson. Is that correct?

25 MR. HELM: Yes. Roberta Livesay is not a

1 witness. She's an attorney.

2 CHAIRMAN EISENHOWER: But she's a speaker?

3 MR. HELM: Just as cross-examination is
4 needed from her. She won't be for making a presentation.

5 CHAIRMAN EISENHOWER: But that's part of
6 your team, correct?

7 MR. HELM: Yes. She's an attorney just like
8 I am, does the same stuff I do.

9 CHAIRMAN EISENHOWER: Okay. And for the
10 State, John, you have three -- John Fuller -- you have
11 yourself, Gary Huckleberry, and Barbara Tellman?

12 MR. FULLER: We've said all we need -- we're
13 going to stay on the Gila River.

14 CHAIRMAN EISENHOWER: And you've said
15 everything that you have to say. But you will be
16 available tomorrow for the Verde?

17 MR. FULLER: Yes.

18 CHAIRMAN EISENHOWER: Okay, thank you.

19 Mark, you have some people here, Roberta
20 Goldberg, yourself, Dr. Littlefield, and Dr. Schumm. Is
21 that correct?

22 MR. MCGINNIS: Yeah.

23 CHAIRMAN EISENHOWER: Anybody else?

24 MR. MCGINNIS: Roberta Goldberg is just like
25 Ms. Livesay, I think. We're just here to ask questions.

1 And Dr. Littlefield's direct is done. We have this two-
2 or three-hour cross, I guess, from Mr. Helm, and then
3 Dr. Schumm, whatever that takes.

4 CHAIRMAN EISENHOWER: Okay. Now, I've got
5 some other individuals here. I will go through these and
6 please tell me if you're going to be associated with any
7 of these three groups that I just spelled out or if you
8 represent somebody else.

9 Allen Gookin and John Hestand, I know you
10 represent the Pimas.

11 Joy?

12 MS. HERR-CARDILLO: Here.

13 CHAIRMAN EISENHOWER: Okay. You're by
14 yourself, so to speak.

15 MS. HERR-CARDILLO: So to speak.

16 CHAIRMAN EISENHOWER: John, you have two.
17 Bill Staudenmaier, you're an observer
18 status?

19 MR. STAUDENMAIER: Correct.

20 CHAIRMAN EISENHOWER: Gotcha.

21 Joe?

22 MR. SPARKS: Only for purposes of clarifying
23 and asking questions of the witnesses. But I did have a
24 housekeeping matter I want to present to the chair -- the
25 commission.

1 CHAIRMAN EISENHOWER: Okay. Please keep it
2 short because we're running out of time.

3 MR. SPARKS: In fairness to the State,
4 before they completely close their case, in the report on
5 the Verde --

6 CHAIRMAN EISENHOWER: We're going to do the
7 Verde tomorrow, Joe.

8 MR. SPARKS: I know, but I just want to make
9 a comparison.

10 CHAIRMAN EISENHOWER: Okay.

11 MR. SPARKS: Compared to the report on the
12 Salt -- on the Gila, in their appendices, they gave
13 examples of what they were reciting to in the report.
14 However, in their appendices on the Gila, they did not.
15 And so there's no way for us to look at their report.
16 There's -- I'll give you an example of Appendices D of the
17 2003 report. That's from navigability of the Colorado
18 River to Safford, just as an example. The oral history is
19 on file with the Arizona State Land Department Draining
20 and Engineering section. That's no information
21 whatsoever. It didn't say what oral history is not
22 included. In the Verde, they did include it. And that is
23 true all the way through their appendices, so the question
24 I have for the chair and the commission is, are these
25 appendices considered evidence, and if so, then, it seems

1 to me that they would -- should be with some specificity
2 if not, in fact, included in the report physically. I
3 would think that they would be included in the report per
4 se if they were going to be evidence before the
5 commission. However, if they are going to be included
6 only by the adoption of reference, it should have adequate
7 specificity for us to go to the State Land Department and
8 know which ones they're talking about. They do not do
9 that in any one of their appendices of their report dated
10 2003.

11 CHAIRMAN EISENHOWER: Well, we accept the
12 report in total. And so if they submitted it, that's the
13 way it is as far as our evidence is concerned. I will ask
14 Mr. Fuller why the discrepancy, if he knows why the
15 discrepancy.

16 MR. FULLER: I'm John Fuller, JE Fuller
17 Hydrology & Geomorphology. In the revision of the 2003
18 revision of the report, there was no change stated of the
19 information that was in the appendices from the original
20 report. The original report, I believe -- George Mehnert
21 can answer this question -- should still be on file with
22 the commission and so all the appendices information is on
23 file; it has already been filed; it's been filed,
24 actually, for 10 years now. So that information is
25 available from ANSAC.

1 MR. SPARKS: So in the -- I am referring to
2 the 2003 for the one from the '90s, then when I look at
3 appendices D, I will find the oral histories in back here?

4 MR. FULLER: Yes, you will. I'm not sure
5 they're bound in the same volume, but all of the volumes
6 and the appendices -- we just did it to save a few trees.
7 There's no changes to it and it is on file with ANSAC.

8 MR. SPARKS: By expending this one tree, you
9 could have expended enough more ink on it to tell me what
10 histories were involved; however, it isn't there, and it's
11 not there in any one of the references of the appendices,
12 so we'll look at the previous report for that information.

13 CHAIRMAN EISENHOWER: Yeah. If you have any
14 questions, get ahold of Mr. Mehnert and he can provide --

15 MR. SPARKS: I just wanted to clarify what
16 was in the record for this purpose.

17 CHAIRMAN EISENHOWER: Okay.

18 MR. SPARKS: Thank you.

19 CHAIRMAN EISENHOWER: I'll need -- State
20 Land Department, Cheryl, this Dave Weedman, he will not be
21 back. Is that correct?

22 MS. DOYLE: Yes, that's correct. He won't
23 be back.

24 CHAIRMAN EISENHOWER: Dr. August, will you
25 be returning tomorrow?

1 Okay. So I only lose one.

2 MS. DOYLE: I'm sorry, for clarification, he
3 won't be here -- he will be here, but not to testify.

4 CHAIRMAN EISENHOWER: Well, that's all I'm
5 worried -- if he becomes a speaker in one form or another,
6 I've got his request, that's all.

7 Since we are past 5 o'clock, I don't want to
8 get started in another long dissertation so I will adjourn
9 this meeting to recess until tomorrow morning.

10 MR. MEHNERT: Mr. Chairman?

11 CHAIRMAN EISENHOWER: Yes?

12 MR. MEHNERT: Would you ask that the
13 commissioners state and sign the Pima report before they
14 leave today?

15 CHAIRMAN EISENHOWER: Yes. We'll get that
16 done today. So we can get -- we won't be toting that
17 around. So we will recess tonight. Let me check with my
18 two long-distance witnesses.

19 (An off-the-record discussion ensued.)

20 CHAIRMAN EISENHOWER: We will recess until
21 9 o'clock tomorrow morning, same place, same faces.

22 (The hearing was concluded 5:04 p.m.)

23

24

25

1 STATE OF ARIZONA)

2 COUNTY OF MARICOPA)

3 BE IT KNOWN the foregoing proceeding was
4 taken by me pursuant to stipulation of counsel; that I was
5 then and there a Certified Reporter of the State of
6 Arizona. That the questions propounded and the answers
7 given were taken down by me in shorthand and thereafter
8 transcribed into typewriting under my direction; that the
9 foregoing pages are a full, true, and accurate transcript
10 of said proceeding, all to the best of my skill and
11 ability.

12 I FURTHER CERTIFY that I am in no way
13 related to nor employed by any parties hereto nor am I in
14 any way interested in the outcome hereof.

15 DATED at Phoenix, Arizona, this day of
16 , 2005.

17

18

19 Gerard T. Coash, RMR
20 Certified Reporter #50503

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BEFORE THE ARIZONA NAVIGABLE STREAM

ADJUDICATION COMMISSION

In re: Determination of)
Navigability of the Upper Salt) No. 04-008-NAV
River, Small and Minor) No. 04-010-NAV
Watercourses in Gila County,) No. 04-014-NAV
Small and Minor Watercourses in) No. 03-007-NAV
Maricopa County, the Gila River,) No. 04-009-NAV
and the Verde River.)
)

MEETING OF THE

ARIZONA NAVIGABLE STREAM ADJUDICATION COMMISSION

Phoenix, Arizona

November 17, 2005

(Original) Prepared by:
Gerard T. Coash, RPR, RMR
Certified Reporter
Certification No. 50503

1 MEETING OF THE ARIZONA NAVIGABLE STREAM ADJUDICATION
2 COMMISSION was taken on November 17, 2005, commencing at
3 9:13 a.m., at the La Quinta Inn, 2510 West Greenway Road,
4 Phoenix, Arizona, before Gerard T. Coash, a Certified
5 Reporter in the State of Arizona.

6

7

* * *

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16 Mr. Earl Eisenhower, Chairman
Ms. Dolly Echeverria, Vice-Chair
Mr. James Henness, Member

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1 CHAIRMAN EISENHOWER: Is there anybody in
2 the audience that would like to ask Mr. Fuller any
3 questions about the small and minor watercourses in
4 Maricopa County?

5 Hearing none, thank you very much,
6 Mr. Fuller.

7 Our next item of business is something for
8 the commissioners to make a decision on, and that is that
9 we must make a determination of the navigability of the
10 small and miner watercourses in Coconino County. I will
11 entertain a motion from one of my commissioners.

12 MR. HENNESS: Mr. Chairman, I will be glad
13 to made a motion that the determination of the
14 navigability was non-navigable in Coconino County, and all
15 the evidence that was presented, all that testimony that
16 was given in evidence in regard to these items has led me
17 to that decision. My motion is to declare those streams
18 non-navigable.

19 COMMISSIONER ECHEVERRIA: Second.

20 CHAIRMAN EISENHOWER: I have a motion and a
21 second, any discussion?

22 Hearing none, I call for the vote.

23 All those in favor?

24 COMMISSIONER ECHEVERRIA: Aye.

25 COMMISSIONER HENNESS: Aye.

1 CHAIRMAN EISENHOWER: Aye.

2 Opposed?

3 Hearing none, the Arizona Navigable Streams
4 Adjudication hereby finds the small and minor watercourses
5 in Coconino County are non-navigable.

6 I thank the audience for their patience in
7 putting up with this, and we have taken care of that. And
8 we'll resume our hearings on the Gila River. And I'm
9 going to take some things out of -- a little bit out of
10 order this morning. I would like -- because of certain
11 mitigating factors, I would like to ask the Dr. Schumm to
12 make his presentation at this time.

13 Be careful of those wires.

14 Anybody who comes to the podium, if you
15 would speak up loud and clear for our court reporter so
16 that we do have an accurate record.

17 DR. SCHUMM: I'm Stanley Schumm. Very
18 hoarse today, as usual. I'm a fluvial geomorphologist;
19 that's distinguished my type of geomorphology from that of
20 a glacial geomorphologist or a coastal geomorphologist.

21 My background: I have a Ph.D. from Columbia
22 University, worked for the geological survey for about
23 12 years. And then I was at CSU for 35 years and
24 presently Mussetter Engineering. I would like to read
25 description of the Gila River that is in my report, and

1 this relates to work done by other geomorphologist experts
2 in this region. So here I go.

3 "The Gila River is characterized by inherent
4 stability and frequent and destructive channel
5 migration ..."

6 (An off-the-record discussion ensued.)

7 DR. SCHUMM: I must say also that after
8 hearing Dr. Huckleberry's report yesterday, I thought,
9 "What have I got to say after that?" Because I concur
10 with his comments.

11 But let me, again, read this description,
12 and the description of the Gila River is by Anne Chin, who
13 is a geomorphologist, and Will Graf, who worked extensively
14 throughout the Southwest and was at Arizona State. Now he
15 deserted us and went to, I think, North (sic) Carolina --
16 University of North Carolina. So I'll start again.

17 "The Gila River is characterized by inherent
18 instability and frequent and destructive channel
19 migration, and there are reaches of relative stability and
20 instability. For example, during the flood in 1941, the
21 channel shifted" a half a mile "near Buckeye. According
22 to Graf ... the lower Gila River 'typified braided
23 streams,' variable ... "'variable channel configuration
24 and dimensions.' According to Ross," -- who is a
25 geologist, a geological survey in early part the

1 century -- "the river in 1917 was a interrupted stream,
2 that is, one that has local reaches of flow while most of
3 the river was dry."

4 And then coming to Dr. Huckleberry, he
5 "summarizes the character of the Gila River as follows:
6 'The Gila River is a classic example of a dryland river
7 that seldom seeks an equilibrium form. Unlike rivers in
8 humid regions that have more stable channels that are
9 adjusted for more continuous streamflow with less variance
10 in discharge, the dryland rivers are inherently more
11 unstable and more prone to changes in channel
12 configuration."

13 I won't go on because this is exactly what a
14 number of witnesses have said when they described the Gila
15 River.

16 You have seen this slide before when I
17 testified earlier, and it's just my attempt to summarize
18 the range of rivers that we have and that we see
19 everywhere. And it's obvious that we're dealing with
20 number five down here, the braided river. And as we go
21 from the upper left to the lower right, up and down or
22 across, we go from more stable channels in through here to
23 more active meandering channels and finally to our braided
24 channel, which is the Gila River. And so, and here is the
25 various characteristics at the bottom, in terms of

1 sediment flow and flow of velocity, et cetera. So we know
2 what we're dealing with. We've seen these types of rivers
3 and we understand how they behave through time.

4 Next slide. And of course, one of my
5 favorite pictures, the Riney Taub, a wide-braided river on
6 the south island of New Zealand. And it's clear there are
7 multiple low-flow channels during a high flood. The water
8 level was up on the bank. You might not know the river is
9 braided because all the bars are covered by flowing water.

10 At the end of my presentation last time, I
11 was asked if there are any braided rivers that were
12 navigable, and I think that I said yes, the Brahmaputra
13 and the Nile and so on, and here is the Nile. A big --
14 actually a big island in the middle of the channel clearly
15 indicating that under that water you're dealing with
16 braided river.

17 Next please. And it's certainly navigable.
18 The big tourist boat on the left and the faluka right and
19 those falukas move up and down the river and back and
20 forth, transporting all sorts of material, so it's clearly
21 navigable.

22 Believe it or not, this is the Brahmaputra.
23 You have the junction for the Ganges and way back off in
24 the distance you can see a ship and they're probably at
25 150 miles from the sea coast. So clearly, I know this is

1 braided and apparently is navigable. And what's common
2 from all of these, there is plenty of water, and that's a
3 key thing of the large braided river that is a navigable.
4 This is our Mississippi River and it's a braided reach,
5 probably because of a cutoff in the meander up here.
6 Navigability is very important. You can see the tows --
7 few tows in the middle of that river. It's anomalous to
8 call them tows when they're pushers, but that seems to be
9 the most efficient way moving products up and down the
10 river.

11 If you can see this -- Let's go to next
12 one. This is what we're dealing with. We're dealing with
13 barges that are as long as a football field, and I think
14 we have got about 5, 10, 15, 20, 25 of these, so clearly
15 we're moving a tremendous amount of material up and down
16 the river that in some places it's meandering, but right
17 here it's braided.

18 One of the things we talked about is
19 changing river characteristics. This is the Great Plains
20 and it's in western Kansas. It's the Cimarron River in
21 about 1890. You can see it's relatively narrow and deep
22 and highly sinuous. Now this is the -- 1890.

23 In the 1930s there was a period of drought
24 or the Dust Bowl but some very large floods moved through
25 this valley. The average width of the river was about 70

1 or 80 feet there.

2 Here in about 1940, the entire valley floor
3 was channeled, and the river was about a thousand feet
4 wide.

5 Next one. All the bridges washed out also.
6 Here, this is about 1980, the vegetation is coming in on
7 the floodplain. All of these streams started to grow in
8 about 1943, which is the end of the period of large
9 floods. We went into a period of much smaller floods and
10 more continuous flow. So here we have what I consider to
11 be a metamorphosis, complete change in the river
12 characteristics: narrow, deep, sinuous, wide, braided.
13 And now it's becoming more sinuous and recovering its
14 earlier pattern.

15 This is the South Platte east of Denver.
16 That entire vegetated area from here over to here at the
17 turn of the century was sand bed, braided river. You can
18 see the width of the river now, so you're finding the
19 Great Plains stream a major change from a wide-braided
20 channel to a much smaller narrow-braided channel, not a
21 complete change here because it's the same type of river,
22 but we have gone from wide to narrow.

23 And this is the main Platte River in
24 Nebraska, probably at least a half a mile wide. It's
25 braided. And this is the North Platte. Again, you can

1 see how this bridge has disappeared -- sort of disappeared
2 in the horizon. Now, at the present time, the river is
3 much narrower, and the old bridge supports are turning
4 from the new floodplain. So here we have got a situation
5 on the Platte, the Arkansas. We started out with a very
6 wide river and because of human activities, diversions,
7 and so on, we now have a much narrower braided river.

8 Here is the Gila River today near Gila Bend.
9 Clearly it's dry, but it's very, very wide and braided.
10 And the same location essentially looking downstream here.
11 So in this particular area, we have the Gila River as it
12 was probably in 1912, wide, braided, with a low-flow
13 channel you can see down there.

14 And the next. As we go downstream,
15 characteristics of the river change. Here it's defined
16 between lava flows and so there's probably major geologic
17 control here, and farther downstream, the river is
18 channelized. It's difficult to see where the old channel
19 actually was. And the next one.

20 This is near Wellton and probably -- this is
21 very much like the Platte River. It's filled with
22 vegetation and probably was the width of the Gila River
23 channel in, say, 1912, and now it's narrowed considerably.
24 It's a much narrower river, but it's still braided even
25 though it's been reduced in width considerably through

1 time.

2 This is the Gila River near Calva, which is
3 a considerable distance upstream. The top picture is
4 1932, the bottom one is 1964. And again, this is what we
5 have seen in that last slide. Here we have a very wide
6 braided river with probably islands developing with
7 vegetation, colonizing the islands. And now we have a
8 much narrower braided river as a result of all the
9 activity that you've heard of in the last day -- day or
10 so. Next one.

11 Here is the result of Burken, and it's up in
12 the -- I can't think of the name of the valley -- well
13 upstream, and it shows that in 1905 to about 1930, even
14 though he's describing the area in terms of acres -- area
15 in acres, it shows a major change, major increase in width
16 which we all know and we heard it described before. So
17 it's a tremendous change in the channel of the Gila River
18 through time, but again, it's a change from a wide-braided
19 river to a narrow-braided river.

20 COMMISSION COUNSEL JENNINGS: Dr. Schumm,
21 that is, you say, the upper valley, you're talking about
22 the Safford Valley?

23 DR. SCHUMM: Safford Valley.

24 COMMISSION COUNSEL JENNINGS: The upper Gila
25 Valley there?

1 DR. SCHUMM: Yes.

2 COMMISSION COUNSEL JENNINGS: Okay.

3 DR. SCHUMM: And here is Huckleberry's work.

4 Again, in the middle Gila, we see the same thing, the
5 dramatic increase -- in this case, channel width --
6 dramatic increase in channel width between 1905 to about
7 1930. Again, just documenting what we all know and what
8 we heard talked about before.

9 Here is the Gila in 1867 to 1915. This is
10 just downstream of the junction of the Salt and the Gila.
11 They are very similar with a relatively straight channel,
12 but the latter one is considerably wider, braided. The
13 map doesn't indicate braiding from the upper map, but
14 there's a large bar or island here and knowing the type of
15 sediment load that's in the channel, early -- the earlier
16 map of braided river. And here we have the braided river
17 in about 1915.

18 This is upstream from Buckeye. Again, the
19 river in 1880, the upper map, and 1970, the tremendous
20 increase that you can see. It might be hard to believe
21 but certainly that's a pattern that's characteristic of
22 sand, even though the surveyor shows a low-water channel.
23 It's clear we're dealing with a very wide range of area
24 that's approaching a mile in width, whereas earlier it was
25 just a fifth of a mile.

1 Now here we are downstream. This is an
2 error in my report in which I locate this township 8 south
3 range 9 west -- actually it's 19 west. And this is the
4 river in 1912. Again, showing a relatively wide-braided
5 river. We don't have a copy of the map, but this
6 indicates a braided river a considerable distance
7 downstream.

8 Finally, the aerial photographs in 1934
9 showing the river about a mile wide from here up to here
10 with a couple of low-flow channels. And again, typical
11 braided river.

12 And this is essentially the same area
13 downstream from Buckeye with a more characteristic sandy
14 bed and low-water channel.

15 So that's what we're dealing with, a
16 relatively narrow-braided channel in the early years,
17 converting to a very wide-braided channel, indications of
18 great instability.

19 So really all I can say, in conclusion, is
20 to agree with everything that Dr. Huckleberry and
21 Dr. Fuller said about this river -- unstable in 1912, at
22 the time of statehood, was a wide characteristically
23 braided river. Thank you.

24 MR. MCGINNIS: Sort of a housekeeping
25 matter. We would like to submit Dr. Schumm's slides as

1 evidence. Do you have copies of them?

2 DR. SCHUMM: I can have them made.

3 MR. MCGINNIS: We can either give you the
4 slides or -- I'm assuming you would prefer to have copies
5 made.

6 CHAIRMAN EISENHOWER: Yes, that would be
7 easier.

8 MR. MCGINNIS: We will send them to you.

9 CHAIRMAN EISENHOWER: Okay, thank you.
10 Appreciate that.

11 MR. HELM: We don't have copies of some of
12 those slides. Is that correct?

13 MR. MCGINNIS: Well, they're right there.

14 (An off-the-record discussion ensued.)

15 CHAIRMAN EISENHOWER: You heard Dr. Schumm's
16 presentation.

17 Laurie, would you like to ask a few
18 questions?

19 MS. HACHTEL: Laurie Hachtel for the Arizona
20 State Land Department and the Attorney General's Office.

21 Good morning, Dr. Schumm.

22 DR. SCHUMM: Good morning.

23 MS. HACHTEL: I didn't want to disappoint
24 you, so I just have a few questions on your report, just
25 to clarify a few things.

1 (Dr. Schumm is answering questions.)

2 BY MS. HACHTEL:

3 Q. First, Dr. Schumm, I noticed the title of your
4 report is the "Geomorphic Character of the Lower Gila
5 River." I was wondering if you could tell me exactly what
6 reach of the Gila River are you opining to?

7 A. Well, when I wrote the report, I thought this
8 hearing was just for the lower river from the junction of
9 the Salt to the junction of the Colorado.

10 Q. So are you opining that the entire reach of the
11 Gila River is non-navigable? Is that your opinion,
12 Dr. Schumm?

13 A. My opinion is that the probability of navigation
14 on this lower reach of the Colorado is very low.

15 Q. So --

16 A. Because the river is highly variable and for a
17 short reach you might say, "Well, we can put a boat in
18 here and go half a mile," but certainly not more than
19 that, and that's what the historical documents seem to
20 indicate.

21 Q. And you said that's in regards to the lower
22 reach. Is that correct?

23 A. Well, that's the title of my report, but the data
24 and information that I have from Huckleberry and Burkham
25 show that the river was -- the entire river increased in

1 width during that time. So my assumption is it's wide,
2 it's shallow, steep, braided river. And that type of
3 river without the vast quantities of water in the Nile and
4 the Brahmaputra, would likely be susceptible to
5 navigation.

6 Q. And that's for the -- again, just to clarify --
7 for the entire river -- Gila River?

8 A. Until we -- now, I haven't seen the river
9 upstream near the state boundary and it may be a different
10 type of river. I know there's bedrock control the farther
11 upstream you go in New Mexico, which is probably not
12 relevant here, but it would be a very different type of
13 bedrock in the channel.

14 Q. So again, just so I can -- I'm really trying to
15 understand what you're opining to as far as the Gila. Is
16 it the -- you said near the state border you haven't
17 looked at it. I'm just trying to understand what part --
18 or if it's the whole thing that you're saying is
19 non-navigable? That's all I would like, Dr. Schumm.

20 A. I only have the information that I have taken
21 from Huckleberry and Burkham. I've looked downstream at
22 maps and aerial photographs and I flew the river through
23 the junction of the Salt to the Colorado. So I only saw
24 it from the air, and of course, that's in its present
25 condition, which is in many cases very different from what

1 it was in 1912.

2 Q. So, Dr. Schumm, is it your opinion that the
3 entire length of the Gila River through Arizona is
4 non-navigable?

5 A. I would have to say yes, that's my conclusion.

6 Q. And Dr. Schumm, can you tell me, besides this
7 report that you completed, what other studies or work have
8 you done on the Gila River?

9 A. In the past, I can't recall that I did anything.

10 Q. And can you tell me what type of fieldwork you
11 did in preparation for your report?

12 A. We just flew -- flew the river in a helicopter.
13 Not on the ground at any of these locations, but I
14 reviewed as much of the literature as I could acquire and
15 looking at the available General Land Office maps and USGS
16 topographic maps.

17 Q. Dr. Schumm, I would just like to explore a little
18 bit in your report, a couple of sections.

19 I noticed in your presentation you had the
20 slide of the Nile and so from what I gather, then, some
21 braided rivers can be navigable, such as the Nile. And
22 when you -- in your testimony, you said the difference
23 between the Gila River and the Nile was that the Gila
24 doesn't have the water that the Nile has. Is that
25 correct?

1 A. That's true.

2 Q. And Dr. Schumm, can you tell me as far as how
3 much water usually would make a braided river navigable in
4 your opinion?

5 A. Depends on the river, the size of the river.

6 Q. Well, can you give me an idea as far as what --
7 is there a certain type of boat that if it was on, for
8 instance, a braided river that had enough water in it,
9 that would be navigable in your opinion?

10 A. I'm sorry, I didn't follow that.

11 Q. Is there a certain type of boat that would make a
12 difference as far as the amount of water in a particular
13 braided river that you would say that particular river is
14 navigable versus one that didn't have enough water, for
15 instance, like the Gila River, that you're opining is
16 non-navigable?

17 A. I can't tell you. The upper Mississippi is
18 braided -- island braided, and the Corps of Engineers
19 maintain a 9-foot depth there to carry the commerce up and
20 down, so that's the only case that I'm aware of that I
21 know what is needed, and it's 9 feet of water.

22 Q. So there's not such -- overall, you don't have an
23 opinion as far as what -- how much water a river -- a
24 braided river would need or what type of boat would need
25 to be on it in order for it to be a braided river and be

1 navigable?

2 A. No.

3 Q. In your report, Dr. Schumm, you described the
4 Gila as intermittent, right? It's on page 8 of your
5 report. I just wondered if you could define for me what
6 you mean by "intermittent"?

7 A. Well, I'm using the terminology of Ross in his
8 1923 report. And basically what he's saying here is some
9 reaches of the river where there's water -- flowing water
10 and other reaches at the same time that -- where the river
11 is dry.

12 Q. Do you know whether Ross determined that the
13 river was intermittent because of -- that the low flow had
14 been removed by diversions or other obstructions?

15 A. I don't believe he said anything about that.

16 Q. Or whether it was naturally intermittent?

17 A. I would guess that it's naturally intermittent.

18 Q. And do you know, what reaches of the Gila River
19 does Ross's description apply to?

20 A. Somewhere down below Gila Bend.

21 Q. Okay. And then, Dr. Schumm, on page 12 of your
22 report you conclude that the morphology of the river was
23 not conducive to navigation. Can you define for me what
24 you mean by "morphology"?

25 A. The characteristics of the channel. The width,

1 the depth, the pattern, distribution. If you're going in
2 this great detail of distribution of bars in the channel.
3 The position of the low-water channel.

4 Q. And did you develop a cross-section for the river
5 that indicates a shape, width, or depth on -- in
6 preparation for your report or today?

7 A. I made some measurements on maps and calculated
8 or measured the width in some locations. I'm not sure
9 that I used that information in my report.

10 Q. And what did you use to do those calculations?
11 What did you rely upon, Dr. Schumm?

12 A. No, I didn't calculate anything. I just measured
13 the width.

14 Q. Based on the maps that you referred to?

15 A. Yes.

16 Q. On the maps that you referred to, were they the
17 1934 aerials? Is that you were referring to or is
18 something else?

19 A. The aerials that I showed, yes, I measured the
20 width there. And I then -- let's see, I think that I
21 measured width on the USGS topographic maps the best I
22 could; some places were very difficult to determine what
23 the width was.

24 Q. And, then, specifically what you're referring to
25 when you're doing those measurements, can you tell me what

1 sections of the river those were for, what particular
2 reaches that you did those on?

3 A. Well, those last two photographs were upstream of
4 Gila Bend.

5 Q. And Dr. Schumm, is it your opinion that it's
6 possible the river that experiences changes during floods
7 can be navigated?

8 A. I'm sorry?

9 Q. That a river that experiences changes during a
10 flood, is it your opinion that a river like that can be
11 navigated?

12 A. Sure. I'm sure the Nile and the Brahmaputra have
13 changed during floods.

14 Q. Dr. Schumm, on page 12, you conclude that the
15 hydrology prevented navigation if the river were dry on
16 the day of statehood, February 14, 1912. And my question
17 is, what is the source of the hydrologic data on which
18 base your opinion?

19 A. Just the U.S. Geological Survey that's referenced
20 "USGS 1954."

21 Q. And did you consult any other data other than
22 that -- the hydraulic records for the Dome gauge?

23 A. Well, I looked at -- I looked at -- let's see. I
24 think I looked at the other gauging stations to see if the
25 big floods were characteristic of as much of the river as

1 I was looking at.

2 Q. Did you look at any other measurements other than
3 the Dome gauge as far as -- you said you looked at them
4 for floods. Did you look any other -- use those
5 measurements at all?

6 A. Just the mean annual discharge.

7 Q. For other gauging stations as well?

8 A. I think mainly the Dome gauge.

9 Q. And, Dr. Schumm, is it possible that the reason
10 the river was dry at Dome is because of water storage and
11 diversions?

12 A. Sure. Yes.

13 Q. Would you agree that irrigation diversions and
14 dams are man-made structures and not natural features of a
15 river?

16 A. Yes.

17 Q. And, Dr. Schumm, you said that you were looking
18 at the median flow rates at the Dome gauge, can you tell
19 me what the average annual or median flow rate is at the
20 Dome gauge?

21 A. Not without the data. I don't have it with me.

22 MS. HACHTEL: I think that's it. Thank you,
23 Dr. Schumm, no more questions.

24 (Dr. Schumm is answering questions.)

25 BY MS. HERR-CARDILLO:

1 Q. Good morning, Dr. Schumm. My name is Joy
2 Herr-Cardillo. I'm with the Arizona Center for law in the
3 public interest, and I represent Defenders of Wildlife,
4 some individual citizens in this proceeding.

5 I'm not looking to retread, but I just want
6 to clarify and follow up on some questions that Laurie
7 asked you. It's my understanding that you personally only
8 studied the lower Gila. Is that correct?

9 A. That's right, yes.

10 Q. And can you just clarify for the commission what,
11 then, is the basis for your opinion with respect to the
12 navigability of the Gila above Safford?

13 A. Oh, above Safford? I didn't consider that
14 really.

15 Q. Okay. So you don't have an opinion as to the
16 navigability of the Gila above Safford?

17 A. Well, my feeling is the river generally is
18 braided, wide, shallow, and therefore, what I concluded
19 from the downstream reaches would apply to the upstream
20 reach -- reaches until one encounters bedrock somewhere.

21 Q. But you didn't actually study the upper reaches?

22 A. No. I just took the data from Huckleberry and
23 Burkham.

24 Q. Okay. And when you talk about the data from
25 Huckleberry, are you referring to his testimony before the

1 commission yesterday?

2 A. That and his geomorphology report.

3 Q. The report of -- what -- where would we find that
4 report?

5 A. It seems to me it's in three of the navigability
6 reports.

7 Q. Okay.

8 A. It's a chapter in some of the larger reports.

9 Q. In what was submitted by the State Land
10 Department to this commission?

11 A. I don't remember whether it was State Lands --
12 yes, I think that's right.

13 Q. John Fuller's report?

14 A. Yes.

15 Q. Okay. If I can ask you, in forming your opinion
16 regarding the navigability of the Gila River, did you
17 attempt to determine what the river would have been like
18 in 1912 had there not been all of the diversions on the
19 river?

20 A. No, I didn't.

21 MS. HERR-CADILLO: That's all I have.

22 CHAIRMAN EISENHOWER: I assume, Mr. Helm,
23 you would like to ask a question?

24 MR. HELM: Absolutely. Could I just ask
25 Jack, quickly, one question because I don't want to

1 misstate some of the testimony from yesterday. And I'm
2 old and my memory is going quick.

3 CHAIRMAN EISENHOWER: Well, Dr. Schumm is
4 the witness.

5 MR. HELM: I just want to make sure I'm not
6 going to misstatement something when I ask Dr. Schumm a
7 question.

8 CHAIRMAN EISENHOWER: Please hurry.

9 DR. SCHUMM: You're pretty peppy for an old
10 man.

11 MR. HELM: I had that whiskey this morning.

12 DR. SCHUMM: I wish you had saved some.

13 MR. HELM: You should have called.

14 (Dr. Schumm is answering questions.)

15 BY MR. HELM:

16 Q. John Helm for Maricopa County.

17 You started off your testimony with some
18 quotes from some other geomorphologists who have studied
19 the Gila River. Do you recall that?

20 A. Yes.

21 Q. Okay. And I believe you mentioned Graf and Ross.

22 A. Yes.

23 Q. Do you know if any of the studies that Graf or
24 Ross did, their studies encompassed the Gila River before
25 there were any diversions or dams built?

1 A. My recollection is that in Graf's case, he was
2 just describing very recent changes in the river channel.

3 Q. As he saw it when he went out and studied it?

4 A. Yes.

5 Q. Okay. And would that be the same for Ross?

6 A. Ross was an early geologist. I'm not sure what
7 he did. He may have just made an observation as he
8 traveled along the river and reported it in his papers.

9 Q. You talked about Ross mentioning intermittent
10 flow in 1917 at -- was that Dome?

11 A. No. It was just a general statement as I recall.

12 Q. Would it be fair to say that the Gila River was
13 totally diverted by 1917?

14 A. I don't know.

15 Q. You didn't do any study to determine how much of
16 the Gila River had been diverted before statehood, dammed
17 up, et cetera, et cetera?

18 A. No.

19 Q. Now, you also mentioned the work done by Mr. --
20 or Dr. Huckleberry. You heard his testimony here
21 yesterday, didn't you?

22 A. Yes.

23 Q. You heard his testimony that he did that study,
24 the Gila River in its normal and natural or ordinary
25 condition?

1 A. He studied the river as it exists.

2 Q. When he went out and studied it?

3 A. Yes.

4 Q. Now, is it fair to say the study that you
5 conducted didn't have any element of looking at the river
6 in its natural and ordinary condition?

7 A. What do you mean by "natural and ordinary"?

8 Q. How it would have been before the westerners
9 moved west and started damming the river and diverting the
10 flow to grow crops.

11 A. I didn't consider it.

12 Q. And so your conclusions on braiding and things
13 like that and the river being in that condition are based
14 on the river as you looked at it either in 1912 or after
15 1912?

16 A. And in the General Land Office maps, which are
17 considerably earlier, I think.

18 Q. Were you asked by your client to study the river
19 and determine the effects that it would have had on its
20 navigability if there had been any diversions?

21 A. No.

22 Q. Were you asked to look at it if there hadn't been
23 any dams?

24 A. No.

25 Q. Okay. If you had, do you think -- Strike that.

1 Would you agree that the channels would look
2 different if there hadn't been any diversions or dams?

3 A. Probably the dimensions would be different, but
4 the pattern and with the gradient probably would remain
5 the same.

6 Q. When you're talking about dimensions you're
7 talking about both depth and width?

8 A. Yes.

9 Q. Okay. When you were looking at it currently, did
10 you happen to see the river when it was in what we
11 euphemistically around here call flood stage?

12 A. No.

13 Q. So you don't know whether it was bank-to-bank
14 full this winter even?

15 A. No, I don't.

16 Q. In the CFS that we had down there?

17 Do you know how much CFS it would take to
18 allow someone to canoe on a river?

19 A. It would depend on the characteristic of the
20 river.

21 Q. In a shallow braided river?

22 A. I don't know.

23 Q. Would it be safe to say that you also don't know
24 for most of the small craft that were used, let's say,
25 during Colonial times?

1 A. Colonial times?

2 Q. Sure. The flat bottom boats, the canoes that the
3 trappers used, those kinds of crafts?

4 A. It wouldn't need great depth, but it would depend
5 on what you're transporting. If you're transporting
6 goods, you need more clearance, more depth.

7 Q. What about transferring beaver pelts?

8 A. I have no idea what a beaver pelt weighs.

9 Q. Now, the condition of the Gila River today is a
10 function of the amount of water it's had to flow down it,
11 isn't it?

12 A. Probably, yes.

13 Q. I believe you talked -- I forget the river you
14 talked about, but you talked about rivers that had become
15 narrower over time?

16 A. Yes.

17 Q. Braided rivers that become narrow? Had those
18 channels become deeper?

19 A. The -- what my conclusion was that the low-flow
20 channel became the main channel, and the remainder of the
21 channel became a new floodplain.

22 Q. And did that low-flow channel that became the
23 main channel deepen to carry the water that used to be
24 carried on the floodplain?

25 A. It was hard to tell, the ones I looked at. It

1 didn't have enough data on the cross-sections to be able
2 to tell.

3 Q. And you didn't go out and do any studies yourself
4 to determine whether they deepened?

5 A. Well, even if I had, I wouldn't be able to
6 determine that.

7 Q. There is not historical data to determine that?

8 A. There might be someplace, but I have not found
9 it.

10 Q. Can a braided river ever relative to meandering?

11 A. Only if the characteristic and sediment load
12 changes.

13 Q. So your answer would be yes, it could relative to
14 a meandering river if there are changes?

15 A. I'll say yes, but I can't give you any examples
16 of that.

17 Q. Are you aware of any actual rivers where after
18 mankind had used them for a number of years, somebody went
19 in and tore out all the structures that man had put in
20 those rivers and returned it to its natural state?

21 A. There are places where dams are being removed,
22 but I can't tell you exactly right now where this is
23 taking place.

24 Q. But even in those places -- I'm aware of some in
25 California and in the Northwest -- they are not removing

1 all of mankind's impact on that river, are they?

2 A. Probably not.

3 Q. So if the standard to determine whether a river
4 is navigable in its natural and ordinary state, as I
5 define that, we don't have any actual rivers that you're
6 aware of that we could go look at and say, "By golly, here
7 is what happens to a river when we restore it to its
8 natural state"?

9 A. No.

10 Q. Have you ever done any hypothetical studies on
11 that in the flows that you ran up at Colorado State?

12 A. On the removal of dams?

13 Q. On returning a river to its natural state.

14 A. No.

15 Q. And if I understand your report and your
16 testimony here, the change in the Gila River from the
17 stable river that you found it to be in 19- -- 18 --
18 before 1891, is because of the floods that occurred in
19 1891, 1905, and 1906?

20 A. I don't think the river was ever stable. There
21 was going to be changes in the channel, bank erosion.
22 It's just characteristic of the river.

23 Q. That's characteristic of all alluvial rivers,
24 isn't it?

25 A. Well, if we go back to my diagram, there's a

1 highly sinuous channel in the upper left. And we found
2 that if the meanders are formed of high silt clay content,
3 the channel is extremely stable, but as it becomes more
4 sandy, the meanders become more active. So there's kind
5 of two groups of meanders, stable meanders and active
6 meanders.

7 Q. But the instability of alluvial rivers is known,
8 isn't it?

9 A. Well, we can determine it from historical
10 documents.

11 Q. The Mississippi is an alluvial river, isn't it?

12 A. It's surprising how much geologic control there
13 is on the Mississippi.

14 Q. Do you know anything about the geologic control
15 on the Gila?

16 A. No.

17 Q. Didn't do any study? You don't know what
18 geologic controls exist on the Gila?

19 A. No.

20 Q. Mississippi moves around, doesn't it?

21 A. Well, it used to.

22 Q. Well, subject to the Corps of Engineers control
23 of it?

24 A. Right. It was very active in fact.

25 Q. Now, if I also understand your testimony here,

1 you did no actual fieldwork on the Gila River in
2 developing your opinions?

3 A. That's right.

4 Q. I just want to clarify one thing. I was trying
5 the listen here. You talked about -- or I believe
6 Ms. Hachtel or somebody asked you about surveying
7 cross-sections?

8 A. Yes.

9 Q. You didn't go out there and survey any
10 cross-sections on the Gila River to determine the depth of
11 the channels?

12 A. No.

13 Q. As it exists today?

14 A. No.

15 Q. You didn't do it for -- or you didn't look at any
16 surveys that had done that for other periods?

17 A. No.

18 Q. You're aware that they're in existence, though?

19 A. Yes.

20 Q. For example, you could go to the Maricopa County
21 Highway Department and pick up a few, probably, couldn't
22 you?

23 A. Probably.

24 Q. Might even get a couple from your client if you
25 asked, right?

1 A. Certainly.

2 Q. Just to expand that question, kind of to dot the
3 I, cross the T -- and you didn't do any surveys or make
4 any attempt to make any determinations on what the depth
5 -- I'm not sure how to describe this -- the main channel
6 of a braided river where the thalweg is, the low-flow
7 channel -- you get the picture I'm driving at -- that
8 channel, even in a braided river, that will carry the most
9 water to determine how deep that would be?

10 A. No.

11 Q. Is it also fair to say that in your study you
12 never did any analysis about what the non-flood flows
13 would be?

14 A. I looked at the mean annual discharge for the
15 USGS water supply papers.

16 Q. At Dome?

17 A. Yes, at Dome.

18 Q. How about for the rest of the river?

19 A. I don't recall. I don't think so.

20 Q. Okay. And you certainly didn't do it for what it
21 would have been in its natural condition?

22 A. No.

23 Q. You testified about your figure one.

24 A. Yes.

25 Q. Figure one, I believe, is in your report?

1 A. Yes.

2 Q. And you had it up on screen here and then you
3 showed us a series of pictures of various rivers and the
4 Gila River at various times and that sort of stuff. Have
5 you done anywhere in your work any categorization of those
6 pictures so that I could know which category on your chart
7 they fell in?

8 A. At the bottom of that page, there's a
9 classification of rivers based upon the sediment
10 characteristics, and you could use that to locate yourself
11 in the diagram.

12 Q. I understand. But what I'm saying is you
13 haven't -- you showed the picture and you haven't said
14 "that's a 3b" for that picture, which is all I -- I don't
15 know what this means. So you have to bear with me on
16 that.

17 A. Do you know what "3b" means?

18 Q. I don't know what 3b means or where it fits in
19 the classification?

20 A. That's mine.

21 Q. Here's 3b.

22 A. I was thinking of someone else's 3b. It's
23 actually just based on the pattern.

24 Q. So what you're saying, if I went back and looked
25 at those photos again when Mark gives them to us, it would

1 be fair for myself or somebody like George Sabol to say,
2 "Well, that picture is a photo" -- or "fits a 3b"?

3 A. Well, the trouble is that the photos I showed
4 were number five, the braided channel.

5 Q. So in your opinion, all the photos you showed
6 fall into the category that's illustrated in the figure --
7 in Figure 1 were in the five category?

8 A. Right. The lower right hand corner.

9 Q. As I am looking at it, the lower right-hand
10 corner?

11 A. Yes.

12 Q. You showed Figure 7, I believe. The --

13 A. Yes.

14 Q. What category would Figure 7 in the top -- top
15 part fall into on your Figure 1?

16 A. I would say five.

17 Q. So you're saying this narrow channel thing is a
18 five?

19 A. Well, it's narrower than the channel on the
20 bottom, but you can still have braided streams of all
21 dimensions.

22 Q. Have you ever seen that -- you never saw that in
23 its actual condition?

24 A. You mean the 1869 one, no?

25 Q. Yeah.

1 A. No. I'm old, but I'm not that old.

2 EXECUTIVE DIRECTOR MEHNERT: But Mr. Helm
3 was.

4 MR. HELM: I thought you might have grown up
5 around there somewhere.

6 BY MR. HELM:

7 Q. And you would say that the lower half of that
8 would be a five also?

9 A. Yes.

10 Q. And you would say that the Gila is a five?

11 A. Yes.

12 Q. And you would say, "I don't know what the Gila
13 would have looked like" -- in terms of your figure -- "in
14 its normal and natural or normal and ordinary condition"?

15 A. Well, I would speculate that it was braided, but
16 I don't know the width -- what the width would be.

17 Q. Well, I guess where I'm going is, it would look
18 significantly different than the pictures you showed us
19 here earlier because, number one, it would have been a
20 perennial flowing stream, correct?

21 A. I'm not certain about that.

22 Q. Before -- this is before we got here.

23 A. There are drought and dry periods.

24 Q. Absolutely can have a draught, but in its natural
25 and ordinary, not meaning an unusual event like a draught

1 or a flood?

2 A. Well, it would be more water than there is at
3 present, but I don't know what that amount of water would
4 be.

5 Q. I take it that you would say that the river was a
6 braided river before the 1891 flood?

7 A. Yes.

8 Q. And you described the river before the 1891 flood
9 as "a relatively narrow and deep channel" river, in your
10 report. Is that fair? In your Conclusions, number 1?

11 A. Some locations, that would be correct because
12 people have described it that way.

13 Q. You don't -- but my point is, you don't tell us
14 the locations where it's not that way, do you?

15 A. No.

16 Q. Okay. So what I have as your report here, that's
17 what the report says, right?

18 A. Where are we in the report?

19 Q. Page 12, figure -- Conclusions, number 1.

20 A. Yes.

21 Q. Okay. Now, at least not all the diversions took
22 place before 1891, although there were a whole bunch of
23 them, so would that description be more representative of
24 the river in a natural and ordinary condition without
25 diversions?

1 A. Say that again.

2 Q. Sure. Your description in Figure 1 talks about
3 the river before 1891, and all I'm asking, would that
4 description that you used as the river before 1891, in
5 number 1 of your Conclusions, be more typical of what that
6 river would look like if we hadn't come around and built
7 Roosevelt Dam and all of the other dams and done all the
8 diversions that we did?

9 A. Well, in fact, below the dams there probably
10 should be a deepening of the channel.

11 Q. What I'm driving at is for the whole lower Gila,
12 not just at a location below the dam.

13 A. I don't know if this description applies to the
14 entire Gila because the point -- I think the point that I
15 am making is that it's highly variable and it changes its
16 characteristics and we have seen that in dimensions.

17 Q. Does some of the variability come from the fact
18 that there has been water diverted out of it?

19 A. I think the variability is related to fluctuating
20 discharges peaking.

21 Q. And one fluctuation is no water, right?

22 A. Could be.

23 MR. HELM: Thank you, Dr. Schumm.

24 CHAIRMAN EISENHOWER: Is there anybody else
25 that has any questions for Dr. Schumm?

1 MR. HESTAND: With the commission's
2 permission. And I will be brief, I promise.

3 CHAIRMAN EISENHOWER: Thank you, sir.

4 MR. HESTAND: The greatest lie an attorney
5 can ever say is, "I only have one more question."

6 Sir, thank you for being here today to help
7 us.

8 CHAIRMAN EISENHOWER: Identify yourself.

9 MR. HESTAND: My name is John Hestand, here
10 on behalf of the Gila River Indian community. I have some
11 questions; perhaps you can help us kind of understand how
12 the system works.

13 Now, you had your photograph of the river
14 with sandbars and obstacles in it, and my question is, is
15 the depth of the water or the amount of water in the river
16 the only factor that would contribute to whether or not
17 the river was navigable, or are there other factors that
18 would also contribute, such as barriers in the river?

19 A. Barriers would be important, obviously. But in
20 addition to the water flow and the flood events, the type
21 of sediment load transported by the river is very
22 important. And again, I haven't studied the geology
23 associated with the Gila. But elsewhere, even on the
24 Mississippi River, faulting -- faults that cross the river
25 effected and uplift -- doming effected, so I don't know

1 whether that applies to the Gila.

2 Q. So as a general rule, though, if there are a
3 number of sandbars or rock outcroppings or whatever,
4 without regard to the flow, these would be obstacles to be
5 dealt with?

6 A. Well, bedrock outcrop could change the gradient
7 substantially.

8 Q. Now, you mentioned sediment. Am I correct in my
9 understanding that if a river carries a great deal of
10 sediment, that that could end up being a barrier to it
11 being used for navigability?

12 A. Well, if it was transporting large amounts of
13 sand and gravel, it would be a wide-braided river, so it
14 would be much shallower than a river that's transporting
15 primarily suspended sediment.

16 Q. Very good, sir. And lawyers like to play with
17 dates, and we like to argue whether natural and ordinary
18 means 1912 or natural and ordinary means 4387 B.C. And so
19 I'd like to avoid that and deal with just some general
20 concepts.

21 The Gila River, in the pre-Euro-American
22 stage -- was the Gila River in the pre-Euro-American stage
23 a flashy river?

24 A. I think that it would be because of the nature of
25 climatic conditions.

1 Q. So there were times of extremely low flow and
2 then times of massive floods. Is that correct?

3 A. Yes.

4 Q. Okay. And am I correct that floods are not a
5 man-made activity?

6 A. Correct.

7 Q. Okay. The flood is going to occur when God
8 decides, not because a human being is irrigating or
9 something. Is that correct?

10 A. Unless there has been a release from a dam, a
11 reservoir, that would create a flood.

12 Q. Okay. And so whenever there is a flood, as I
13 understand it, the flood tends to widen out the riverbed,
14 flatten out the channels and create the braiding. Is that
15 correct?

16 A. Well, the flood may be just modifying what is
17 already there, and the braided river is there preflood.
18 It would be there post-flood, but the configuration of the
19 bed and the distribution of the bars would be changed.

20 Q. Okay. Now, am I given -- let's say that we had a
21 regular release of water over a long period of time. I
22 mean, a predictable steady release of -- and I won't give
23 you a cubic feet per second because it could depend on how
24 wide the area is -- but for a period of several years you
25 had a predictable amount of water coming out in a

1 predictable pattern, would that tend to entrench and
2 create a more predictable riverbed?

3 A. Again, it depends on the sediment in the bed. I
4 believe the bed can armor and stabilize.

5 Q. Now, am I correct that dams oftentimes flatten
6 out the instance of floods by holding them back and
7 keeping high flow that would normally flow through held
8 back so that it didn't flow through?

9 A. If that's the way that the flow is managed by the
10 dam.

11 Q. Okay. So let's say we're talking about water
12 storage dams, and let's say that a 25-year flood was
13 coming through and the water storage dam could hold the
14 25-year flood and that because there was a water storage
15 dam, they chose to hold it, that meant that that 25-year
16 flood wouldn't then go through. Is that correct?

17 A. Right.

18 Q. And so any widening of the channel, any braiding
19 that that flood would have caused but for the dam would
20 not then occur. Is that correct?

21 A. Yes.

22 Q. So in actuality, the creation of the dams, if
23 anything, would increase the predictability of the flow
24 rather than decreasing the amount of expansion and
25 contraction that would happen in the absence of the dams.

1 Is that correct?

2 A. I didn't follow you, I'm sorry.

3 Q. Okay. And that's the problem when you have a
4 lawyer trying to talk technical.

5 Without the dam, you're going to have water
6 coming through at regular stages in large amounts,
7 broadening out the area and either continuing rearranging
8 the braiding or wiping out the established channel and
9 creating new braiding. Is that correct?

10 A. Well, we wouldn't wipe out the channel.

11 Q. Modifying the channel?

12 A. The banks -- the banks might be unchanged, but
13 the bed might be modified simply by the shifting of sand
14 and sediment.

15 Q. Very good. And if we cut out a number of those
16 floods, then we're cutting out a great deal of that
17 rearrangement, aren't we?

18 A. It wouldn't occur as frequently.

19 Q. Okay. So in actuality, the creation of the dam
20 would, in many ways, make the river more stable than it
21 was before the dam's existence. Is that correct?

22 A. It could if the bed armors. But if the bed
23 armors, then the banks are attacked, so it's difficult to
24 say.

25 MR. HESTAND: Thank you, sir. This has been

1 very helpful. I appreciate it.

2 CHAIRMAN EISENHOWER: Does anybody else have
3 any further questions?

4 Mr. Jennings, our counsel, has a couple if
5 you don't mind, Dr. Schumm.

6 COMMISSION COUNSEL JENNINGS: Dr. Schumm,
7 thank you again.

8 (Dr. Schumm is answering questions.)

9 BY COMMISSION COUNSEL JENNINGS:

10 Q. Would vegetation growing in the floodplain affect
11 the characteristics of the river?

12 A. It could stabilize the banks of the river.

13 Q. And I was speaking there of natural vegetation
14 that would grow up during the period in between the floods
15 that might take it out.

16 A. You're wondering if this affects the floodplain?

17 Q. Yes. The characteristic of the river, either
18 putting more island in, making it more braided, or less
19 braided, or whatever.

20 A. Vegetation colonized the floodplain. It should
21 -- the floodplain should normally have some vegetation
22 before you drop down into the channel, so that vegetation
23 could trap sediment and build up the floodplain higher
24 than it is. And if the vegetation is growing nearer the
25 banks, it could help stabilize the bank.

1 Q. Now, let me go one step further and ask you about
2 man-introduced vegetation not native to the area, such as
3 the Salt Cedar, the Tamarisk, as we call it, that was
4 planted with great relish all up and down the Gila River;
5 would that have affected the characteristics of the river?

6 A. I think so. It's a nasty bit of vegetation and
7 it really stabilizes the -- if there is a period of low
8 flow, it could move the channel and stabilize the channel.

9 Q. And then what would happen when -- after it's
10 well-stabilized -- a major flood comes along?

11 A. It could remove that vegetation or the flood
12 could be -- flood peak could be changed by flow through
13 the vegetation.

14 Q. And could one of the results be that it would
15 spread the floodplain because of the stabilization created
16 by the Salt Cedar, the little islands, and so forth?

17 A. Yes.

18 Q. Now, you've been testifying as to navigability --
19 well, let me ask you this, vegetation then affecting the
20 characteristics of the river would certainly affect the
21 navigability characteristics, would it not?

22 A. Probably, yes.

23 Q. Now, we've been talking about natural and
24 ordinary and it seems everyone has a definition of that as
25 to when did you, in your report, come up with a period of

1 time when the conditions you felt on the river were in
2 their natural and ordinary condition?

3 A. I gave that no consideration because I didn't
4 realize it was part of this activity.

5 Q. Well, you've been asked a lot of questions about
6 the removal or diversion from the river, and the -- they
7 were directed -- the questions were directed to the
8 post-Colombian, post-European period of time. Did you
9 consider any of the ancient civilizations that apparently,
10 from the archeological reports, diverted major parts of
11 the river, particularly down in the Casa Grande, Florence
12 area, as long as 2000 years ago?

13 A. I didn't consider that.

14 Q. Okay.

15 A. I read the accounts of some of the explorers and
16 trappers.

17 COMMISSION COUNSEL JENNINGS: I have no
18 further questions.

19 CHAIRMAN EISENHOWER: Thank you.

20 Well, with that, thank you for your time,
21 Dr. Schumm, your presentation, and thank the people who
22 are involved here and good luck to you, sir.

23 And with that, we will continue on with our
24 Gila River presentation, and I believe Dr. Littlefield is
25 our next person in live to testify.

1 MR. MCGINNIS: I wonder if you would want to
2 take a break for the court reporter, because we've been
3 going an hour and half?

4 CHAIRMAN EISENHOWER: Sure. We will take
5 about a 10-minute break and everybody get a drink and all
6 that kind of thing.

7 (A recess ensued.)

8 CHAIRMAN EISENHOWER: It's time to go back
9 into session again. First up on the agenda is
10 Dr. Littlefield, who would be testifying.

11 Mr. McGinnis, do you have any questions to
12 lead off with?

13 MR. MCGINNIS: No, Dr. Littlefield did his
14 direct yesterday. We're stuck with cross now.

15 CHAIRMAN EISENHOWER: That's fine if you
16 have nothing further to add.

17 Is there anybody in the audience who wishes
18 to ask questions of Dr. Littlefield?

19 Yes, I know you're here, Mr. Helm. Please
20 come forward.

21 MR. HELM: I think we're the only ones that
22 are left. I could be correct, but I think everybody else
23 did their cross-examination yesterday, and I'm left to
24 bloody the floor.

25 CHAIRMAN EISENHOWER: Okay. It's good

1 thing.

2 MR. HELM: As indicated yesterday,
3 Ms. Livesay is going to take the doctor on his surveying
4 work, because we had to kind of divide up the work because
5 of the short notice on that thing. Then I'll go over the
6 rest of the report when she's done.

7 MS. LIVESAY: Good morning, Dr. Littlefield,
8 Mr. Chairman, members of the board. My name is Roberta
9 Livesay, and I'm representing Maricopa County. And I'm
10 going to try and make sure that my voice goes into the
11 microphone. If anybody has any problems, please let me
12 know.

13 CHAIRMAN EISENHOWER: The microphone is for
14 our tape recorder, and you need to speak clearly for the
15 court reporter. And also, when you ask a question, let
16 Dr. Littlefield have time to answer so you don't start
17 talking over one another. It just confuses the tape
18 recorder.

19 MS. LIVESAY: I'll try to be aware of that.

20 CHAIRMAN EISENHOWER: Thank you very much.

21 (Dr. Littlefield is answering questions.)

22 BY MS. LIVESAY:

23 Q. Dr. Littlefield, I understand that you are a
24 historian, you are not a licensed surveyor. Is that
25 correct?

1 A. That's correct.

2 Q. And as far as I can tell from looking through the
3 documents, you have no special training in practice of
4 surveying. Is that also correct?

5 A. Other than having spent many years reviewing
6 surveyors' documents and instructions and manuals, I have
7 no other special training.

8 Q. And as far as your review of the survey documents
9 and text, your conclusions that you set forth in your
10 report are based on your interpretation of those
11 documents. Is that also a fair conclusion on my part?

12 A. I believe the documents speak for themselves for
13 the most part.

14 Q. I assume, Dr. Littlefield, that you would accept
15 other interpretations of survey practices, procedures,
16 definition of terms, that kind of thing, if such were
17 properly documented?

18 A. That's correct.

19 Q. Okay. So in that regard, Dr. Littlefield, would
20 you -- I think you will agree with me -- you have reviewed
21 this text, a "History of the Rectangular Survey System,"
22 by White, rather extensively in preparation of your
23 report?

24 A. That's correct.

25 Q. So you do consider this to be an authoritative

1 text with respect to surveys, correct?

2 A. Yes. And so is the Department of the Interior.

3 Q. And that's where I was going next.

4 The Department of the Interior also
5 publishes texts on surveying, correct?

6 A. That's correct.

7 Q. So I have with me today, for just availability
8 sake, the Manual of Surveying Instructions, 1973, U.S.
9 Department of the Interior, Bureau of Land Management. To
10 the extent that this text is relevant to the time period
11 that you studied, you would accept the terminology and
12 definitions and explanations that are set forth in this
13 text as well, correct?

14 A. I don't see how that text could be relevant
15 unless it's reprinting documents from the time period that
16 I studied. It's a current document, and I don't know
17 anything about it.

18 Q. Okay. But if it does relate directly to that
19 time period, you would accept that as being helpful?

20 A. I would have to see what it says about it.

21 Q. Okay. And I assume you would also accept court
22 decisions, United States Supreme Court and other courts of
23 appellate jurisdiction, if they shed some light on the
24 terminology, practices, and procedures relating to surveys
25 -- U.S. government surveys?

1 A. I only offered in my report and in my testimony
2 what the surveyors were told by the land office to do, and
3 also to the extent that the surveyors had documentation
4 reflecting what they did. That's the only material that I
5 dealt with. To the extent that courts have interpreted
6 that material or to the extent that courts have directed
7 the land department of surveyors to operate in certain
8 means, I haven't reviewed any of that.

9 Q. But you would accept those documents as
10 authoritative in this field, wouldn't you doctor?

11 A. I would have to see what they say. I'm not an
12 attorney or judge, so I would have to see what they say.

13 Q. Now you would agree, wouldn't you,
14 Dr. Littlefield, that none of the government survey
15 manuals used at the relevant time period to your study
16 gave any definition or instructions to the surveyors as to
17 how to determine navigability, correct?

18 A. The terminology that was offered in most of the
19 contracts and in the manuals was that they were to survey
20 -- meander streams that were navigable. I believe the
21 exact phrase was "under the statute." And what they meant
22 by that, the 1796 statute, which I cited in my report,
23 which was subsequently codified. Other than that, that's
24 the only indication that I know of where they were
25 provided with this precise definition of what to consider.

1 Q. Now, at the time your deposition was taken, you
2 hadn't read that statute, correct?

3 A. I don't recall.

4 Q. Okay. Let me refer you to --

5 A. You're referring to my deposition from the
6 Gillespie Dam matter?

7 Q. Yes.

8 A. Yeah, I don't recall.

9 Q. Let me read to you from page 73 of that
10 deposition. You are talking about the report.

11 "My report indicates that it was never
12 presented specifically only to the extent
13 that it said, 'which under law are navigable?'

14 The question: "And that was a specific
15 reference to a statute, wasn't it?

16 "Answer: It was codified I believe, yes.

17 "Question: And that statute doesn't
18 define it, does it?

19 "Answer: I don't know whether it does
20 or not.

21 "Question: You didn't looked at that
22 statute?

23 "Answer: No."

24 Does that refresh your memory?

25 A. If that's what the deposition says, that's what I

1 said.

2 Q. So is it your testimony today that you have gone
3 back since that time and reviewed the statute?

4 A. I don't recall whether I have. I did ask to get
5 the stat citation as opposed to the codification version,
6 but I don't recall whether I read it or not.

7 Q. The statute doesn't contain any specific
8 instructions or directions as to how to determine
9 navigability, does it, Doctor?

10 A. I don't recall.

11 Q. You do agree that the determination of what was
12 navigable was a discretionary decision of every individual
13 surveyor doing the work?

14 A. That's correct.

15 Q. Now, again, at the time you had your deposition
16 taken, you didn't have any specific understanding of what
17 was meant by "natural arteries of internal communications"
18 that's used in the survey instructions, correct?

19 A. No, I don't know what they meant by that.

20 Q. And you also would agree that your conclusion
21 that surveyors determined that the Gila River was not
22 navigable is your own interpretation of their work,
23 correct?

24 A. No, that's not correct. What I'm reporting in my
25 report and in my testimony was that all the surveyors who

1 were there elected to -- when they encountered the Gila,
2 elected to treat the Gila in their surveys in a manner
3 that was consistent within their view of what was a
4 non-navigable body of water.

5 Q. But it is true, isn't it, Dr. Littlefield, that
6 none of the surveyors make any statement that says
7 specifically the Gila River is not navigable?

8 A. That's correct. They didn't need to. They were
9 told exactly what to do if they thought it was navigable
10 or if it wasn't, so they didn't need to use those precise
11 words.

12 Q. And so it is your interpretation of the words
13 that they did use that they were concluding that it was
14 not navigable, correct?

15 A. Well, it's my interpretation of their
16 instructions, as well as what they were paid, as well as
17 what they did in terms of the surveys and setting out
18 meanders or not setting out meanders. I think it's all
19 pretty persuasive that they either were going to deal with
20 a navigable body of water or weren't. I don't think they
21 needed to use that precise word.

22 Q. And you agree that they did not use that precise
23 language, correct?

24 A. To the best of my recollection, they did not use
25 that exact word.

1 Q. Now, on page 12 of your report, you state that
2 the Arizona survey began in approximately 1865 with the
3 choosing of the initial baseline and meridian by John
4 Clark. Is that correct?

5 A. If you give me a minute, I'll locate for you. Or
6 if you could tell me approximately where on the page it
7 is?

8 Q. I think it's up at the top of the page --

9 A. Yes, that's what my report says.

10 Q. And that's correct, to your knowledge?

11 A. If you look at the footnote citation at the end
12 of that passage, it cites, C. Albert White, "A History of
13 the Rectangular Survey System," that book that you brought
14 and that I referred to; this is what Mr. White indicated
15 in his book happened with regard to choosing the initial
16 survey site.

17 Q. And you don't have any other information that
18 would indicate that that's not a correct statement?

19 A. I think Mr. White's book is fairly comprehensive.
20 If it's incorrect, then I would be willing to be shown
21 documents to the contrary.

22 Q. Now, the Arizona survey began in approximately
23 1865, according to White's book. But in your report, you
24 chose to use the Oregon field manual as the starting point
25 for your discussion of the Gila River survey work,

1 correct?

2 A. The Oregon field manual was the manual that came
3 into use in 1851 and was the manual that governed how all
4 surveys after 1851 were done in the west until new manuals
5 were issued. It was called the Oregon field manual
6 because at the time, in the late 1840s, that's where most
7 of the overland immigrants were going, either Oregon or
8 California. So when the manual was published, it was
9 entitled -- or its title was reflecting where most
10 settlement was taking place, but it was the manual that
11 was in effect at the time of the surveys that were started
12 in Arizona.

13 Q. And I believe my question, Dr. Littlefield, was,
14 you chose to use the Oregon field manual as the starting
15 point for your analysis. Is that correct?

16 A. That's the first manual that was in use.
17 Correct.

18 Q. Okay. Good. Now, I have also gone over this
19 book, in the short time that I've had, and I didn't see
20 anything in there that said that the Oregon field manual
21 was supposed to be used for all surveying that was done
22 from that point on. It's limited to Oregon from what I
23 can read. Can you point me to anything in that survey
24 that says it's to be used elsewhere?

25 A. Well, I think if you had gone through the survey

1 contracts that are available at the National Archives, you
2 would find that the survey contracts of the early
3 surveyors said, in their directions to the surveyors, "You
4 will follow the published instructions that are of the
5 land office that are currently in effect." And given
6 Mr. White's authoritative study of the surveys that were
7 done, that was the manual that was in effect. So I don't
8 think it's too much of a leap of faith to say the
9 surveyors in Arizona used the manual that was in effect
10 because that's what they were told to do. They used the
11 Oregon manual because there was no other one at the
12 particular time.

13 Q. Well, our survey started in 1865. We established
14 that. Isn't there also instructions to the surveys
15 general of public land of the United States for those
16 surveying districts established since the year 1850 that
17 was published in 1855?

18 A. There was the 1855 manual. There was also the
19 1864 manual. Both of those made very few changes to the
20 original Oregon manual. I have noted the changes that are
21 relevant with regard to bodies of water in my report. I
22 think I've covered that very thoroughly. If you would
23 like, I would be glad to point out the precise changes
24 that occurred from manual to manual.

25 Q. I think it's just fine for this purpose. Now,

1 Dr. Littlefield -- and we'll go through, and if you have
2 any quarrel with my citations to the 1865 or 1864 manual,
3 you can raise them at that time.

4 A. I would be glad to.

5 Q. Now, on page 13 of your report at -- towards the
6 bottom, again, you're referring to the instructions to the
7 surveyor general of Oregon. But you begin a discussion
8 about an instruction that the White text refers to as
9 "insuperable objects on line - witness points," do you see
10 that?

11 A. You're on page 13?

12 Q. Yes, at the bottom. You see the sentence that
13 starts "First, the instructions provided that when
14 surveyors encountered 'impassable objects'?"

15 A. Yes. You said "insuperable." But I see the
16 passage that says the word "impassable."

17 Q. Okay. But that's from a section in the White
18 text that's headed "Insuperable" -- "Insuperable Objects
19 on Line - Witness Points" -- that's the heading of that
20 section in the text, isn't it?

21 A. I don't recall what's the heading. You would
22 have to go back to the White volume to correct that. The
23 footnote for that particular paragraph indicates that it
24 came directly -- for the quote at least -- came directly
25 out of the instructions to the Surveyor General of Oregon

1 as reprinted in White's book.

2 Q. Okay. We have provided the commission -- and we
3 have some extra copies as well -- of some excerpted
4 passages from the White text. And is there a copy up
5 there for the witness?

6 MR. HELM: I don't know.

7 BY MS. LIVESAY:

8 Q. Well, let me have you go ahead and use the text,
9 then, for this question. You can turn to page 461,
10 Dr. Littlefield?

11 A. I'm sorry, which page?

12 Q. 461.

13 A. Yes, I have that page.

14 Q. Okay. And you'll see the heading there,
15 bracketed number 5, "Insuperable Objects on Line - Witness
16 Points."

17 A. Yes, I see that.

18 Q. Now, this is from the 1855 instructions, but
19 you'll see the same language, I believe, as you quote on
20 the bottom of page 13 of your report. In the text there,
21 under Insuperable Objects on Line, it talks about under
22 circumstances where your course is obstructed by
23 "impassable obstacles, such as ponds, swamps, marshes,
24 lakes, rivers, creeks, and et cetera." Do you see that in
25 the text as well as in your report?

1 A. Yes, I see that.

2 Q. Okay. So that was the same, basically, as what's
3 in the Oregon instructions, correct?

4 A. Yes.

5 Q. All right. So what the instructions are
6 basically telling the surveyor to do is that if he
7 encountered an impassable obstacle, which includes rivers,
8 he was to prolong his line across the obstacle by taking
9 right angle offsets or using other survey techniques?

10 A. Well, that's only part of it. If you look at
11 page 14 --

12 Q. I'm getting there, Dr. Littlefield, so if you
13 would just stay with me. Question --

14 A. I would like to answer your question, if I may?

15 Q. Well, the question right now is, I just want to
16 establish this first part. And we will get through it, I
17 promise you. We will go farther, but as far as this first
18 part is concerned, that's basically what the instruction
19 is, isn't it?

20 A. Yes, that's correct.

21 Q. Okay, thank you.

22 Now, if the impassable obstacle occurred at
23 the intersection of lines, the surveyor was to establish a
24 witness point, sometimes called a witness post or witness
25 corner; is that also included in that part of the

1 instruction?

2 A. Yes, that's correct.

3 Q. Now, witness points, post, or corners can also be
4 used to establish a meander or meander corner, can't they?

5 A. Yes.

6 Q. All right. You then -- in your report, you
7 continue on to discuss meander corner posts. And again,
8 to your knowledge, Dr. Littlefield, the 1855 and 1864
9 instructions, with regard to meander corner posts, are
10 essentially the same as they are in Oregon survey that you
11 looked at?

12 A. I believe so.

13 Q. Now, again, sticking with page 461 of the text,
14 on the right-hand side of the column, the second paragraph
15 under meander corner posts states the following: "The
16 courses and distances on meandered navigable streams
17 govern the calculations wherefrom are ascertained the true
18 areas of the tract of lands (section, quarter section, et
19 cetera) known to the law as fractional and binding on such
20 streams." Do you see that?

21 A. Yes, I do.

22 Q. So if a surveyor calculated the true areas of a
23 fractional tract of land on a meandered stream, that
24 calculation was binding and this would indicate a
25 navigable stream, correct?

1 A. I don't know to the extent that it was binding.
2 You don't indicate binding on whom. But that's the
3 instruction that they were given as it is reprinted from
4 the instructions.

5 Q. Now, would you agree with me, Dr. Littlefield,
6 that the purpose of meandering was to ascertain the
7 quantity of land in the fractional section that would be
8 subject to sale?

9 A. That was one of the purposes.

10 Q. Page 22 of your report, you talk about the 1902
11 instructions.

12 A. I think you must be operating from my earlier
13 draft of the report. My page 22 doesn't have that, of the
14 current report. Are you using the current report?

15 Q. I certainly thought I was.

16 A. I can tell you what's on my page 22.

17 Q. Does it have a heading "B. Summary and
18 Conclusions Regarding" --

19 A. Yes, it does.

20 Q. Okay. And you see the line that is second to the
21 bottom of that paragraph, it starts, "In addition, as the
22 1902 instructions illustrated, surveyors also used the
23 term 'meander' (frequently incorrectly) to identify
24 irregular survey lines along reservation boundaries"?

25 A. Yes, I see that.

1 Q. There isn't any indication anywhere that
2 surveyors use the term meander incorrectly with respect to
3 rivers, is there?

4 A. Not in the historical documents that I have seen.

5 Q. I'll take the book back from you.

6 Surveyors weren't vested with power to make
7 legal determination of navigability, were they,
8 Dr. Littlefield?

9 A. I don't believe they were.

10 Q. I would like to skip ahead to the section
11 starting on page 30 of your report. And I hope we've got
12 the same page here. The top of the page should be a
13 capital letter D, "U.S. Government Surveys Along the Gila
14 River"?

15 A. Yes, I see that.

16 Q. Okay. Now the first areas that you discuss with
17 respect to the surveys are township 1 north and range 1
18 west; township 1 north and range 2 west; and township 1
19 south and range 2 west, correct?

20 A. I will take your word for it. I don't remember
21 exactly which ones I discussed in my report. As I
22 indicated in my direct testimony, I examined every
23 township and none of the material in that in any of the
24 surveys conflicted with the material that I did discuss in
25 my report.

1 Q. Okay. Now the survey for township 1 north and
2 range 1 west, there the surveyor set a number of witness
3 corners, correct?

4 A. Could you point me to where I say that in my
5 report.

6 Q. You don't.

7 A. I don't remember it precisely without looking at
8 it exactly.

9 Q. I'm sorry, this is first time I've appeared
10 before the commission. I'm not sure where the exhibits
11 are. Do we have the surveys up there?

12 MR. HELM: There's six of them.

13 BY MS. LIVESAY:

14 Q. Dr. Littlefield, we're going to get a copy of the
15 survey folders that we prepared for the commission up
16 there for you so you can follow along. The first one I
17 need the witness to look at is township 1 north, range 1
18 west, it should be the very first folder on the top. And
19 can you find in there a copy of the plat map,
20 Dr. Littlefield?

21 A. I'm sorry?

22 Q. Can you find in there a copy of the plat map?

23 A. This is the one that's identified as officially
24 filed on 12-2-1870.

25 MR. MCGINNIS: Excuse me, just for

1 housekeeping, those have evidence numbers just for the
2 transcripts so we can keep it -- know what we're talking
3 about, because I'm not sure, once we get the transcript,
4 we'll know what documents we're talking about.

5 EXECUTIVE DIRECTOR MEHNERT: They don't yet.
6 We just received them yesterday.

7 MR. MCGINNIS: Okay.

8 EXECUTIVE DIRECTOR MEHNERT: And what is
9 their title? What's the correct title for them, for those
10 folders?

11 MS. LIVESAY: These are the surveyor's notes
12 and plat maps that are for the stretch of the Gila River
13 from -- starting 1867 and going forward.

14 DR. LITTLEFIELD: I think, just for the
15 commission's information, we need to be a little bit more
16 precise than that because the -- some of these townships
17 were surveyed multiple times, and there can be a lot of
18 confusion if we don't know exactly which plat we're
19 talking about or which set of field notes we're talking
20 about.

21 MS. LIVESAY: And we'll be clear as we go
22 along. These are all organized by file folder and every
23 file folder has a label on it showing the township and
24 range number.

25 MR. MCGINNIS: Okay.

1 MS. LIVESAY: As we go through the documents
2 that are in the file folders, we'll be very careful to
3 identify them so the record will be clear.

4 BY MS. LIVESAY:

5 Q. So what we're looking now is the plat map
6 officially filed 12-12-1870?

7 A. Yes, I see that.

8 Q. And I understood from your discussion on direct,
9 Dr. Littlefield, that one of the things that you would
10 look for to see if, in your opinion, a particular surveyor
11 thought that the river was navigable, would be an array of
12 data on the right-hand side of the plat map that would
13 show meanders. Is that fair?

14 A. That's true. Some of the -- in most cases, some
15 of the township plats that I have seen -- I don't recall
16 if it's on this river or one of the other Arizona ones or
17 in California or Idaho where I've done a lot of similar
18 work -- in some cases the surveyors weren't 100 percent
19 consistent. They were more consistent about putting their
20 meander data into their field notes than they were about
21 putting them on the plat. But as a general rule, you're
22 correct.

23 Q. Okay. And this particular plat map that we're
24 looking at for township 1 north, range 1 west, 1870, does
25 not have a place on the right-hand margin for such meander

1 notes. Is that right?

2 A. That's correct.

3 Q. Now, if you go to the field notes, there should
4 be an excerpt from book 1666, that's three pages stapled
5 together.

6 A. Yes, I have that.

7 Q. And if we're on same piece of documentation, the
8 second page in that group of three should look like this,
9 have book 1666 and up in the corner is a handwritten
10 number 7?

11 A. Yes, that's the surveyor's page numbering.

12 Q. Okay. And you see there, at indication 80.00
13 towards the bottom of page, do you see the writing there?

14 A. Yes.

15 Q. And do you see there where the surveyor is saying
16 that he set witness corner?

17 A. Yes.

18 Q. This surveyor was also interested in looking at
19 fractional sections, and he frequently made reference to
20 fractional sections, correct?

21 A. I don't recall.

22 Q. There should be another set of field notes in
23 that folder. That's book one.

24 A. Yes, I see that.

25 Q. And do you see at the bottom of the first page

1 there, of the excerpt -- it's page 375 -- that the
2 surveyor set a post. And again, he's talking about
3 fractional sections. Very bottom, 71.80.

4 A. Yes.

5 Q. And I'm going to page 387 in that same group of
6 notes. Are you with me?

7 A. Yes, I have page 387.

8 Q. At the bottom there is a section 24.00, I
9 believe, though it's a little difficult for me to read.
10 In any event, the last paragraph of notes on that page, it
11 says "set a post," and again, we're talking about
12 fractional sections?

13 A. Yes. It's not section 2400, that's a reference
14 to the number of chains from the beginning of the survey
15 line. Yes. And he does say set a -- yes, he says setting
16 a post.

17 Q. At fractional sections?

18 A. Correct.

19 Q. And again on page 398?

20 A. Would you like me to refer to a particular part
21 of that?

22 Q. Right in the middle there, on the left-hand side,
23 the very middle set of notes: "To right bank of Gila
24 River, high banks, sandy bed." Then he talks about "set a
25 post to fractional sections"?

1 A. Yes.

2 Q. Okay. Again on page 408, the middle there. The
3 last full paragraph on the bottom of the left-hand column,
4 "Set at post at this point for corner to fractional
5 sections"?

6 A. Yes, I see that.

7 Q. The next page is page 409. Again, right in the
8 middle of the page, "Set a post at this point for corner
9 to fractional sections"?

10 A. Yes, I see that.

11 Q. And then page 423, very bottom. These are under
12 the General Description heading.

13 A. I'm sorry, which page number?

14 Q. Page 423.

15 A. Yes, I see that.

16 Q. The very last statement at the bottom of that
17 page, "It is a fine stream"?

18 A. Yes, I believe I quoted that in my report.

19 Q. Okay. It continues on to the next page.

20 Now, do you have there -- the next folder
21 show be township 1 north, 2 west.

22 A. I have the folder.

23 Q. In this section, the surveyor makes comments that
24 the water is 18 inches deep. Do you recall that?

25 A. You would have to point me to a specific section.

1 I went through an awful lot of surveyor's notes, and
2 without a specific reference, I can't recall.

3 Q. That's fine.

4 A. If you prefer, you could cite me to a page in my
5 report, if that's of any help.

6 Q. I would like to get it out of here if I have it
7 marked properly.

8 Let's go to field notes book 1633. There
9 should be a page in there. A single page.

10 A. Yes, I see book 1633. It appears to be labeled
11 in the upper left-hand corner page 151. Is that correct?

12 Q. Page -- in the upper left-hand corner?

13 A. Yes.

14 Q. Yes, that's -- that's what it looks like. I'm
15 not sure that's what it is. Up in the upper right-hand
16 corner, it looks like a 7.

17 A. Correct. I think we have the same page.

18 Q. Okay. And this isn't exactly the reference I was
19 looking for, but do you see there at chain 29.42, "Left
20 bank of Gila River, low bank, deep water"?

21 A. Yes, I see that.

22 Q. Okay. Now, one of the questions I'm going to be
23 asking you at the end, Dr. Littlefield -- and I just want
24 to give you a preview as we're going through these
25 folders -- tell me, if you can, from your recollection all

1 of the plat maps show both right and left bank lines for
2 the section of the Gila River that goes through the map
3 that's in these folders, correct?

4 A. I believe that's correct.

5 Q. Okay. Just one quick question from folder
6 township 1 south, range 2 west.

7 A. Yes, I have the folder.

8 Q. Field notes book 1166.

9 A. Yeah, there are several pages to that. Do you
10 have one in mind?

11 Q. Yes. Page marked 97 in the upper right-hand
12 corner. Should be the third page in.

13 A. I see that.

14 Q. Okay. Do you see the note at the bottom of that
15 page, "There is plenty of water in the Gila River for
16 irrigation"?

17 A. Yes. That's what it says.

18 Q. The next section that you look at in your report
19 is township 4 south, range 4 west, correct?

20 A. I'll take your word for it.

21 Q. But before I get to that specific section of your
22 report, Dr. Littlefield, there are some things that I
23 would like you to look at in some of the other folders.
24 Would you turn to township 1 south, 3 west?

25 A. Yes, I have the folder.

1 Q. Do you recall going through the field notes
2 related to this section?

3 A. Not specifically. I assume that I did. I went
4 through them all.

5 Q. Okay. You've got field notebook 1167?

6 A. Yes.

7 Q. It starts with an index diagram on the first
8 page?

9 A. Yes.

10 Q. Okay. Go to the second page. This is a fairly
11 detailed set of notes, isn't it, Doctor?

12 A. These are approximately the same type of notes
13 that they all were.

14 Q. Do you see there the indication that chain 21.60,
15 "right bank deep water"?

16 A. Yes. "Right bank, deep water, low banks."

17 Q. The next page. I can't quite make out which
18 chain it is, but it's right in the middle of the page. It
19 looks like .30?

20 A. You're correct. That's .30.

21 Q. It says, left bank of Gila River has
22 south .80 degrees west, flow banks and deep water measure
23 across.

24 A. Yes. I believe it actually reads "Left bank of
25 Gila River flows south 80 degrees west, low bank and deep

1 water measure across."

2 Q. Okay. Is it fair to say, from just reviewing
3 this, without taking the time to go through each and every
4 indication of the notes, that this surveyor was able to go
5 to both the right and left banks of this section of the
6 river?

7 A. I'm not sure exactly what you're asking.

8 Q. Well, the indications are, from the field notes,
9 that he goes to the left bank then the right bank, and
10 then he goes back to the left bank and back to the right
11 bank.

12 A. They were told to do that in their instructions,
13 where they crossed the river on line, they were to measure
14 across it and using triangulation or other surveyors'
15 techniques and they did, in fact, do that. They placed
16 witness posts on each bank and for bodies of water that
17 were navigable, those were the beginning points for
18 meanders. But yes, they did mark both banks of the river
19 when they crossed them. I might add, that was true for
20 rivers that were both meandered as well as not meandered.

21 Q. And in fact, if you just turn to -- in that same
22 section, book 1167, to page -- seems to be number 97 in
23 the upper right-hand corner. It should be the second one
24 from the back -- no, excuse me, the very last page in the
25 set.

1 A. The top line of the text reads "and raised amount
2 of earth"?

3 Q. Yes.

4 A. Yes, I have that.

5 Q. And then if you go down to 9.00, left bank of
6 Gila River -- and I am having a hard time reading exactly
7 what the next word says there -- then we have a
8 measurement, and then W corner, witness corner, bank
9 measure across.

10 A. Yes. I have spent a lot of time deciphering the
11 handwriting. The word you can't read there is "course."
12 So it actually reads "9.00, chains, left bank of Gila
13 River, course south 31 degree west, low bank measure
14 across."

15 Q. Okay. Again, from the township 1 south, range 4
16 west.

17 A. I have the folder.

18 Q. Field notes book -- field notebook 1632.

19 A. Yes. There are two selections, apparently, from
20 that book. Do you have one in particular in mind?

21 Q. I think that actually we might have some double
22 copying going on, but the one that I would like you to
23 turn to is, I think, 19 up in the upper right-hand corner.
24 Although, again, it's pretty hard to read.

25 A. The top line reads "North BET. Secs 13 and 18"?

1 Q. That's correct. Would you read what it says at
2 3.12?

3 A. 3.12, that would be "Chains, left bank of Gila
4 River" -- I can't make out what the next part is, but it's
5 something east and west -- "low banks and deep water
6 measure across."

7 Q. I'm going to go ahead now with township 2 south,
8 range 5 west.

9 A. I have the folder.

10 Q. Book 1635 of the field notes, there's a single
11 page there in your stack with 50 in the upper right-hand
12 corner.

13 A. Yes, I think I have the page you're referring to.

14 Q. Would you read what it says for 23.00?

15 A. "23.00, left bank of Gila River and set a meander
16 post in" something, "and pit as per instructions."

17 Q. Could that be "in the mound and pit"?

18 A. Could be, yeah.

19 Q. And would you read what it says for 65.00?

20 A. "The right bank of Gila River, 20 feet high and
21 set a meander post in mound and pit as per instructions."

22 Q. And go to book 1161.

23 A. Yes, I see that.

24 Q. There's no chain indication there, but would you
25 read that first paragraph?

1 A. "Meanders of the left bank of Gila River through
2 the township beginning at the meandering post on the south
3 boundary between sections 35 and 2 and following the
4 meanders of the left bank of the said Gila River going
5 upstream."

6 Q. Okay. And then read the paragraph that starts
7 "North 40 -- 3 -- 40, 3/4 degrees west."

8 A. "45, chains to the meander corner between
9 sections 26 and 35, thence in section 26."

10 Q. And continue reading.

11 A. "North 76 degrees, west 8.5, chains" -- I believe
12 it would be -- "to the meander corner, sections 26 and 27,
13 thence in section 27."

14 Q. And there should be a page 143 of book 1161.

15 A. Yes, I have that page.

16 Q. Would you read the text portion -- the first text
17 portion there?

18 A. Beginning with what?

19 Q. I think that's "North 1 degree." I can't really
20 tell.

21 A. "North 1 degree, east 13, chains to a willow tree
22 marked for meander corner." -- I believe it's "on the
23 quarter section line in section 27," and then I can't read
24 what the next word is.

25 Q. In book 1161, another single page, I think it's

1 137, but it's very faint, in the upper left-hand corner.

2 A. I'm sorry, what was the page number again?

3 Q. I think it's 137. It's very faint.

4 A. In which book?

5 Q. 1161.

6 A. And the page number is on the right or the left
7 side?

8 Q. It's on the left, but --

9 If I could come up there, maybe I could just
10 show you what I have got?

11 A. Sure.

12 I can use your copy if you would like.

13 Q. Okay. Dr. Littlefield, I've handed you my copy
14 just for convenience. Would you read the section where I
15 have that little piece highlighted?

16 A. "47.5, chains, right bank of Gila runs
17 southeast" -- or "courses southeast," I'm not sure
18 which -- "and set a meander post in a mound and pits as
19 per instructions, no trees," I think it reads.

20 Q. Okay. Now I'm going to be referring you to book
21 1161, page 138. The copy is a little clearer on this one
22 so hopefully it's there and you can find it.

23 A. I don't seem to have that page in here.

24 Q. Well, we'll just do the same thing.

25 A. Okay.

1 Q. There are two highlighted sections there; would
2 you read them both, please?

3 A. The top one reads "As per instructions, on the
4 left bank, 2 chains north from corner point, which is also
5 a meander corner between sections 26 and 27. Bank bluff
6 and 20 feet high" -- I think it reads "no trees near." I
7 think that's a reference that they were to mark with a
8 glaze on the tree where they were putting out those posts.

9 And the other highlighted one lower on the
10 page reads, "8.20, the left bank the Gila River run
11 southeast and set a meander post." And then it goes on to
12 the next chain reading.

13 Q. And look at the next page where the -- the page
14 number is pretty indecipherable on that one, but if you
15 can identify it by the indications made by the surveyor
16 and read the highlighted portion, please?

17 A. It says it's from book 1161, township 2 south,
18 range 5 west. And the top line, just for identification,
19 says, "Chains, Gila and Salt River meridian at the corner
20 to sections 25, 26, 35, and 36." And the passage that you
21 have highlighted reads "71.8, chains, left bank of the
22 Gila River, 20 feet high and set a meander post in mound
23 and pit as per instructions, no trees near."

24 Q. And what I've just handed you, I think, is marked
25 page 140. And again, would you read the highlighted

1 portion?

2 A. "2.0, chains that meander and witness corner on
3 left bank of river."

4 Q. And this one -- the next page I've handed you
5 again does not seem to have a page on it. It's also from
6 book 1161. And would you just agree that there's a
7 section there where it talks about a meander corner that's
8 highlighted?

9 A. Yes. The passage reads, "48.30, a willow tree
10 10 inches" -- I believe it's "diameter" -- "on the left
11 bank of the Gila River and" -- something -- something "for
12 a meander corner as per instructions. Gila River about 4
13 chains wide here and deep water and" -- something about a
14 bluff. I can't make it out. "There's a steep mountain
15 and no other section lines in this township that" --
16 something or other, it's too faint to read.

17 Q. And lastly, I handed you pages 59 and 60 from the
18 same book. Would you read the references there that are
19 highlighted?

20 A. "78.84, chains, right bank of the Gila River, low
21 banks," something "south, 10 degrees east, set witness
22 corner at this point, corner falling into river."

23 Q. And there's another one on the next page.

24 A. Next page doesn't identify -- maybe it's a
25 continuation of the previous page. I'm not sure.

1 "Set a post 4 feet long, 4 inches square
2 with marked stone, 12 inches in the ground for witness
3 corner to sections 27, 28, 33, and 34 marked."

4 Q. Okay. And I would like to direct your attention,
5 next, to another section of the survey that is not
6 referenced in your report, it's township 3 south, range 4
7 west. And I take it, Dr. Littlefield, that you would have
8 reviewed these field notes as part of your analysis that
9 you present to the commission, correct?

10 A. I did. I reviewed them all.

11 Q. Okay. So if you look inside that folder, please.
12 The first thing I would like you to look at is the page of
13 field notes that's handwritten and has been blown up for
14 easy reading.

15 A. Yes, I see the enlarged page.

16 Q. Okay. Would you read the note for 5.00?

17 A. "Intersect the right bank of the Gila River, run
18 southeast, bluff, bank 20 feet high, and set a meander
19 post in the mound and pit as per instructions, no trees
20 near."

21 Q. And the next note on that same page, 40.60?

22 A. "Left bank of Gila River runs southeast, a
23 cottonwood 6 inches diameter and near" something "for
24 witness, 1 quarter section corner, also for meander
25 corner, bank sloping."

1 Q. In that same folder, book 1635, page 35, up in
2 the upper left-hand corner.

3 A. Yes, I have that.

4 Q. Okay. Would you read what it says there for
5 5.00?

6 A. "Intersect the right bank of the Gila River run
7 southeast, bluff, bank 20 feet high, and set a meander
8 poles in a mound and pit as per instructions, no trees
9 near."

10 Q. Book 1161, page 124 is another set of field
11 notes. Still in township 3 south, range 4 west.

12 A. I'm sorry, what page number?

13 Q. 124. It should be the first page of that set of
14 field notes?

15 A. "3.60, chains, set a meander post on the right
16 bank of Gila River in a mound and pits as per
17 instructions, no trees near."

18 Q. And would you read the next one as well, please?

19 A. "35.10, the left bank of Gila River and marked a
20 cottonwood tree, 10 inches diameter, for a meander corner
21 as per instructions, no other trees."

22 Q. The next page is page 129 in that set.

23 A. Yes, I have that.

24 Q. Would you read the whole narrative on that page,
25 please?

1 A. "Meanders of the left bank of the Gila River
2 through the township beginning at the meander post on the
3 west boundary of section number 7 and going downstream
4 following the meanders of the left and east bank of said
5 river in section 7."

6 Q. And continue, please. The whole page.

7 A. "South 33 degrees east, 24.00 chains. South 47
8 and 3/4 degrees east, 30.00 chains to the meander post
9 between sections 7 and 18, thence in section 18. South
10 15 degrees, east 26 chains. South 2 degrees, east 30
11 chains. South 1 -- or 12 and 3/4 degrees east. 26.00
12 chains to the section -- to the meander corner between
13 sections 18 and 19."

14 Q. And the next page is 130 and if you just continue
15 reading that page as well.

16 A. "Thence in section 19 south, 17 degrees east. 20
17 chains, south 38 degrees east. 15 chains, south
18 20 degrees east. 21 chains, south 27 and a half degrees
19 east. 17 chains to the meander corner between sections 19
20 and 20 thence in section 20."

21 Keep going?

22 Q. Keep going.

23 A. "South 27 and 3/4 degrees east, 16 chains to the
24 meander corner between sections 20 and 29. Thence in
25 section 29, south 22 degrees, east 20 chains. South 18

1 chains, south 20 degrees, east 15 chains. South 29.30,
2 chains to meander corner between sections 29 and 32."

3 Q. And the next page is 131. The narrative
4 continues. If you'd read the first -- the top part of
5 that page where it continues from the previous?

6 A. That's in Section 32, "South 10 degrees west, 20
7 chains" -- or 25, I'm not sure which. "South 18 degrees
8 east, 35 chains. South 2 and 3/4 degrees east, 21 chains
9 to the meander corner on the south boundary of section
10 number" -- it appears to be 32 -- "April 25th, 1871."

11 Q. And then if you just look at the very last
12 sentence on that page, and I will read it, Dr.
13 Littlefield. Mr. Foreman, the surveyor says, "The Gila
14 River flows to the southwest corner of the township and
15 has lively current." Did I read that correctly?

16 A. Yes, you did.

17 Q. There's no language in anything that you have
18 read from these field notes in this section that would
19 indicate an explicit opinion on the part of Mr. Foreman
20 that the river is not navigable, correct?

21 A. I haven't seen the rest of the notes, but in the
22 selections you've offered me, no, there is not.

23 Q. Let's go to page 38 of your report.

24 A. Yes, I have that.

25 Q. I'm going to send you back, real quick, to

1 page 34. I just saw something that I wanted to ask you.

2 Again, do you see the discussion of 1907
3 Interior Resurvey of Township 1 North, Range 2 West?

4 A. Yes.

5 Q. And you made a note there that on the plat, the
6 Buckeye Canal is shown?

7 A. Apparently I did, yes.

8 Q. Do you know how much water the Buckeye Canal
9 would have diverted from the river?

10 A. I have no idea.

11 Q. Now if you go to page 38. This is where you
12 discuss the 1871 interior survey of township 4 south,
13 range 4 west. Is that correct?

14 A. That's correct.

15 Q. Now, one of the first things that I noticed is
16 that you said that the lack -- in second paragraph -- "The
17 lack of meander data for the Gila River in this township
18 is one indication that Gila River was not navigable." Do
19 you see that?

20 A. Yes, I do.

21 Q. Would the presence of meander data indicate that
22 it was navigable?

23 A. It's one of the possible explanations depending
24 on which manual the surveyor was using.

25 Q. Now, let's take a look at the folder for township

1 4 south, range 4 west.

2 The plat map here was officially filed
3 June 23rd, 1871. Do you see that?

4 A. Yes.

5 Q. And this is one of those plat maps where there is
6 no place for meander data to be set forth on the
7 right-hand margin, correct?

8 A. Correct.

9 Q. Okay. Now, if we look at the field notes here,
10 first one I would like to you look at is -- oops. Excuse
11 me. It's noted as book 1161. And I believe that's 41,
12 but I can't make that out real well, but it looks like
13 this.

14 A. Yes, I think that I have that.

15 Q. Okay. Would you look at the bottom of that page,
16 at 3.00, would you read what that says?

17 A. "26.00, right bank of river and set a meander
18 post in mound and pit as per instructions."

19 Q. And what I think you just read was from page 43
20 because that's 26.00.

21 A. Okay.

22 Q. And that's exactly what that does say. Do you
23 have a page that looks like it's page 41?

24 A. What's the chains at the top -- in the top.

25 Q. The chains at the top -- again, it's a little

1 difficult to read, but it looks like 48.00?

2 A. Yes, I have that page.

3 Q. Okay. Would you read what it says at the bottom
4 there for chain 3.00?

5 A. "3.00, left bank of Gila River, set a meander
6 post in mound and pit as per instructions."

7 Q. And there should be a page that's marked page 60,
8 and it only has a little bit or narrative on there. I
9 would like you to read what that says.

10 A. "Meander corner on the south boundary of section
11 32."

12 Q. Thank you.

13 Now, there is page in there, a grid, it
14 looks like this. And it's indexed for township 3 south,
15 range 4 west, on page 63.

16 Are you with me?

17 A. I think I have it.

18 Q. Okay. That has a lot of information set forth by
19 the surveyor, correct?

20 A. Yes.

21 Q. And at the bottom of that grid of information, it
22 says "meanders of Gila River pages" 8 through 60 -- "58
23 through 60." I'm sorry.

24 A. I'm not sure that I'm looking at the same page
25 you are, then.

1 Q. Let me bring it over to you.

2 A. Okay. Maybe I'm looking at a different one.

3 Yes, it says that.

4 Q. Okay. And what you are looking at is where the
5 surveyor has diagramed those meanders, correct?

6 A. I don't think so, not on this page.

7 Q. But in any event, we do have historical records
8 showing meander data for township 4 south, range 4 west?

9 A. Yeah. I would like to clarify something here.
10 There were surveyors that misidentified the posts that
11 they were putting on the edges of streams. They
12 occasionally interchanged using the words "meander post"
13 as well as "witness post," and that was not uncommon.
14 I've seen that in quite a few places. So to the extent
15 that there are meander post on the side of the river here,
16 I'm not particularly bothered by it. I think one needs to
17 look at the overall package of all the surveys along the
18 river.

19 Q. And you don't have any information, as you stand
20 here today, do you, Dr. Littlefield, that would refute
21 that what the surveyor was doing was actually setting
22 meander posts, do you?

23 A. He said he was setting meander posts, that's what
24 he said he was putting there.

25 Q. And you have nothing to refute that, correct?

1 A. That's what he says.

2 I think -- just to help out there, I think
3 the reason why some of these later volumes were issued was
4 simply to clarify the use of the term "meander." And if
5 you'll note, the Solomon Foreman survey was done in 1871,
6 which is one of the earlier surveys, so I'm not surprised
7 that there is some confusion over whether they're setting
8 meander posts or witness posts.

9 Q. And that confusion would be your interpretation,
10 correct?

11 A. That would be my interpretation.

12 Q. Now, I need you to take a look at township 4
13 south, range 6 west, Dr. Littlefield, because this one is
14 not mentioned at all in your report.

15 A. Yes, I have the folder.

16 Q. First thing I would like you to look at is the
17 plat map.

18 A. There are two of them here. Do you have a
19 particular one you would like --

20 Q. I'd like you to look at the one that's officially
21 filed July 12, 1882.

22 A. Yes, I see that.

23 Q. And do you see the layout of all the meanders of
24 Gila River on the right-hand side of that plat map?

25 A. Yes, I do. It's also identified under where the

1 surveyors are who did the meander surveys.

2 Q. And this, in your testimony, is an indication
3 that the surveyor thought that this river was navigable,
4 correct?

5 A. No. As I indicated, beginning in -- I believe it
6 was the 1881 manual, as well as in the 1890 manual, there
7 was circumstances under which both banks of the river
8 would be meandered, that were for bodies of water that
9 were not navigable. The 1881 manual provided for bodies
10 of water that were over three chains wide that were not
11 navigable to be meandered. The 18- -- I believe it was
12 the 1890 manual added to that even bodies of water that
13 were less than three chains wide could be meandered if they
14 weren't useful for -- if the properties -- parcels along
15 the edge couldn't include the body of water for useful
16 homesteading purposes.

17 Q. And if a surveyor was going to do that, you would
18 expect to see it fully documented in his notes that that's
19 the reason that he was meandering, correct?

20 A. I have never seen any of the notes -- well, let
21 me put it this way. I have see a few of the notes where
22 they had precisely said why they did the meanders. Most
23 of the time they don't set out why they did the meanders.
24 Just in one or two circumstances they were precise about
25 why they were doing it. In most cases they just indicated

1 where they signed off in the -- that they did it as per
2 their instructions.

3 Q. So it's simply your personal opinion that these
4 sections were meandered pursuant to some purpose other
5 than an indication of navigability, correct?

6 A. I think when you look at cumulatively all of the
7 surveys up and down the river -- and if you'd like to go
8 through them all individually, I would happy to with you
9 and explain them all.

10 They accumulatively indicate that the
11 purposes for which the meanders were done, in most
12 circumstances, were for reasons that don't relate to
13 navigability under one of the instructions, either the
14 1864 instructions, which said one bank for non-navigable
15 bodies of water that were for internal communication; 1881
16 and 1890, that said either three chains or less than three
17 chains depending on what the nature of the body of water
18 was like, and of course, if they thought it was navigable.

19 Q. I would be happy to do that with you,
20 Dr. Littlefield. And I have gone through every folder
21 that I could get my hands on, and I can tell you that I
22 don't see any place in any of those folders where there's
23 an indication that the meandering was done for some other
24 purpose other than to indicate navigability. If you can
25 point me to some explicit language that offers that

1 explanation, that would be very helpful.

2 MR. SPARKS: Mr. Chairman, I realize that
3 this is not a formal hearing and that you're not using the
4 formal rules of evidence, but that entire monologue was
5 testimony and this is cross-examination, and there wasn't
6 a question in it. And so if the attorney could be
7 directed to ask questions, so that the witness could
8 answer, I think we could get along a little faster here.

9 MS. LIVESAY: I actually think that was a
10 question, sir. I asked Dr. Littlefield to point me to
11 some place in file folders where that explicit language
12 was used.

13 DR. LITTLEFIELD: Explicit language
14 regarding what?

15 BY MS. LIVESAY:

16 Q. The reason for the meandering that would indicate
17 some purpose other than the surveyor's opinion that the
18 river was navigable.

19 A. As I just indicated a moment ago, it was rare for
20 them to say precisely why they did meanders, either
21 navigable or not. And therefore, when I reviewed the
22 surveys and the plats and the field notes, I assumed that
23 the surveyors were operating under whatever instructions
24 were in force at the time.

25 Q. Including the instruction to meander navigable

1 streams?

2 A. They were instructed to do that. And then
3 depending on which manual they're working under, there
4 were other circumstances where they did meanders that are
5 for not navigable purposes.

6 MS. LIVESAY: Mr. Chairman, I just noticed
7 the time. Do you want me to continue? I still do have --

8 CHAIRMAN EISENHOWER: Ms. Livesay, are you
9 going to propose to go through that entire stack?

10 MS. LIVESAY: No, Mr. Chairman.

11 DR. LITTLEFIELD: I would be happy to,
12 Mr. Chairman. I would be glad to go through every single
13 township if you would like.

14 COMMISSIONER ECHEVERRIA: No.

15 CHAIRMAN EISENHOWER: I think that you've
16 established your point that you're trying to make, and I
17 understand that point, but if we can move forward.

18 MS. LIVESAY: What I was offering,
19 Mr. Chairman, is would this be a good time to take a
20 break?

21 CHAIRMAN EISENHOWER: We were planning on
22 breaking about 12:30, so that gives you about another
23 15 minutes to -- unless you want to carry on after lunch?

24 MS. LIVESAY: I hope not, but I can't
25 promise.

1 CHAIRMAN EISENHOWER: Okay.

2 BY MS. LIVESAY:

3 Q. Dr. Littlefield, would you agree with me that in
4 this township 4 south, range 6 west, the surveyor was
5 determining fractional sections?

6 A. Yes, those are the words used.

7 Q. And he was looking for meander posts and setting
8 meander posts as part of his work?

9 A. That's correct. I think you said the fractional
10 section was in reference to the fact that he was doing
11 less than a complete section, meaning a quarter section or
12 a half section or something to that effect.

13 Q. Yes. As we read from Mr. White's book earlier
14 this morning?

15 A. Right.

16 Q. Okay. Now, I would like you to look at book 1743
17 of the field notes.

18 A. I don't have that with me.

19 Q. I'll just hand it to you. It should be in the
20 that file folder. But what I'd like you to confirm for
21 me, when I hand it to you, Dr. Littlefield, is that the
22 field notes at chains 14.72 -- or 12, I'm not sure which
23 it is -- the highlighted portion makes reference to the
24 use of a ferry?

25 A. Yes, it does.

1 Q. Do you agree with me that he was setting
2 fractional sections and meander posts? I'm going to be
3 able to shorten this up a little bit. And again, book
4 1743, page 2, in the narrative here, would you agree there
5 is another reference to the ferry?

6 A. Yes, it is.

7 Q. Let's go to page 44 of your report. I'm sorry,
8 it's actually page 39.

9 A. Yes, I have that page.

10 Q. And that's dealing with township 5 south, range 4
11 west, correct?

12 A. You're talking about the heading at the bottom of
13 the page?

14 Q. Yes.

15 A. Yes, I have that.

16 Q. And the discussion continues over to the next
17 page, page 40. And if I understand it, Dr. Littlefield,
18 what you're saying here is that the surveyor, Mr. Foreman,
19 set meander markers only on the left edges of the Gila
20 River?

21 A. That's what my report says.

22 Q. And your conclusion is that he did this
23 consistent with the 1864 instructions that allowed for
24 meandering of only one bank of the river. Is that
25 correct?

1 A. Yes. He explains it, as I pointed out in my
2 report, he said -- quoting me first, and then I'll point
3 out where his quote begins, "Foreman explained in the
4 meander section of the field notes for this township
5 that" -- and this is Foreman's quote -- "'the reason for
6 selecting the left bank for meanders is that all the lands
7 of value are on the left bank.'" And then my statement
8 again -- "He added that the lands on the right bank" and
9 then Foreman, quote, pinched out, unquote, "due to the
10 proximity of mountains." And then my concluding
11 statement, "In other words, the only lands useful for
12 farming were along the left bank, and for that reason,
13 Foreman had meandered that bank as Hasson," the surveyor
14 general, "had told him to do."

15 Q. But that in and of itself, Dr. Littlefield,
16 doesn't mean that the Gila River was not navigable at that
17 point, does it?

18 A. That's what the surveyor said. I'm just quoting
19 what he said.

20 Q. Right. But he doesn't say that he didn't meander
21 the right bank because it wasn't navigable, just because
22 the land wasn't useful. That was his stated reason,
23 right?

24 A. I can't prove a negative on that. I can just
25 tell what you he said.

1 Q. Okay. Let's take a look at the field notebook
2 1634.

3 (An off-the-record discussion ensued.)

4 BY MS. LIVESAY:

5 Q. It should be in township 5 south, range 4 west
6 folder.

7 A. Okay.

8 Q. And up at the right-hand corner, the page I'm
9 interested in looks like it's marked R4, but it could be
10 124.

11 A. I have that page.

12 Q. All right. At -- chain 73.50 indicates that he
13 set a meander post on the left bank, correct?

14 A. Right.

15 Q. But at 76.00 he indicates that he set a post on
16 the right bank, doesn't he?

17 A. It doesn't says it's a meander post. He said he
18 crossed over and set another post there, he didn't
19 indicate that it was a meander post.

20 Q. What other kind of post could it have been?

21 A. Could have been a witness post.

22 Q. Which would establish -- could also be used to
23 set meanders, correct?

24 A. The surveyors that I indicated earlier frequently
25 interchanged the terms, which is why the later

1 instructions were more precise. I can't explain why he
2 used the terminology that he did here other than to recite
3 what the document says.

4 Q. I understand that.

5 If you turn to book 1165, page 56.

6 A. I have that page.

7 Q. We have the same situation here, don't we, Dr.
8 Littlefield? At 35.00, he sets a meander corner on the
9 left bank, and then at 40.00, he sets a witness corner on
10 the right bank?

11 A. Correct. And I think that's consistent with his
12 instructions to do a one-bank meander if it's a course for
13 internal communication only. He's indicating he's only
14 meandering one bank and he is not going to meander the
15 other bank, which in fact, is what he did.

16 Q. Let's go to book 1165, page 60. If it's in your
17 folder the same as mine, it should be about three pages
18 from where you are. And the 60 is stamped in the upper
19 left-hand corner of the note.

20 A. Yes, I see that.

21 Q. And there, at chain 5.00, on the right bank of
22 the Gila River, he set a post for a meander corner,
23 correct?

24 A. That's correct.

25 Q. And at 8.20, he set a meander post on the left

1 bank, correct?

2 A. That's correct. But I think that if you look at
3 the rest of the document, he only meandered one bank
4 regardless of what he called those posts.

5 Q. And then do you see a grid in your materials
6 about three pages further down?

7 A. It's behind the page we just dealt with?

8 Q. Yes. It should be about three more pages in the
9 materials.

10 A. Is it numbered page 1 in the upper left-hand
11 corner?

12 Q. Yes, 1-A.

13 A. No, I just see page 1.

14 Q. Well, let me give you 1-A. It should be in
15 there.

16 A. I have 1-A.

17 Q. And at the bottom of the grid, it identifies it
18 as meanders 64 to 68?

19 A. That's correct. We've also discussed that he did
20 meander one bank in this township. You might note that he
21 also was the one that dealt with the upstream -- or the
22 adjacent township.

23 Q. Beginning on page 44 of your report --

24 A. With the heading at the bottom "1878 Interior
25 Survey of Township 8 South, Range 17 West (Field Notes)"?

1 Q. Correct.

2 A. Yes, I have that.

3 Q. And that discussion continues on to page 45?

4 A. Correct.

5 Q. Do you agree that in this section, the surveyor
6 was also identifying fractional sections?

7 A. I don't know whether he was or not without
8 looking back at the field notes. I believe that I only
9 discussed where he ran section lines. I don't recall the
10 fractional sections.

11 Q. You should have there the folder for this
12 section, 8 south, 17 west.

13 A. I have the folder.

14 Q. Book 1172, the first page. There is not a page
15 number that I can see on here, but it deals with chains --
16 I think 21.70?

17 A. Page 7 in the left corner?

18 Q. Yes. There it is. Thank you.

19 A. Yes, I have that.

20 Q. Do you see there about the middle of the page in
21 chain 4810 -- it's very difficult to read. I grant you
22 that, but I'll show you my copy where I've highlighted it.
23 Can you tell from that that the surveyor was identifying
24 fractional sections?

25 A. Yes. As I indicated, what he's talking about

1 here is that he is running a line that's not along the
2 edge of an exact -- not along the edge of one section
3 separating another, he's running a line that is
4 identifying a partial section.

5 Q. And we can go through it page by page if need be,
6 Dr. Littlefield, but would you agree that a general
7 statement about this section of work that the surveyor was
8 identifying fractional sections?

9 A. In many cases they did, yes.

10 Q. Okay. Thank you.

11 A. I might add that the later surveys have more
12 interior section surveys than the earlier ones.

13 Q. Now, on page 47 of your report, you talk about an
14 1890 Interior Survey of Township 8 South, Range 21 West.

15 A. Yes. That's the heading on the page.

16 Q. And in the middle of the second paragraph in your
17 report you state that he -- "Martineau clearly did not
18 consider the Gila River to be navigable because he
19 explained in his field notes that his setting of meander
20 corners on both banks was consistent with the new
21 January 1890 instructions." Do you see that?

22 A. Yes.

23 Q. Can you point me to anywhere in his field notes
24 where he makes that statement?

25 A. I believe that's my interpretation because he

1 says he's relying on the 1890 instructions, which provided
2 for surveying bodies of water that may not be navigable
3 under circumstances that, under the 1881 instructions, for
4 three chains and wider and, under the 1890 instructions,
5 three chains or less if they were not useful for
6 homesteading.

7 Q. I understand that, Dr. Littlefield; the problem
8 I'm having is that in looking at his field notes, I could
9 not find a statement that -- where he said he was doing
10 them in accordance with the 1890 instructions for the
11 purposes you have just explained. Are you aware of a
12 specific statement that the surveyor made to that effect
13 or is that your interpretation?

14 A. That's my interpretation.

15 Q. Thank you.

16 And --

17 A. I think it's a reasonable one in light of all the
18 other historical documentation surrounding that particular
19 area at that time.

20 Q. Now, Mr. Martineau did set witness corners and
21 meander corners in this section, didn't he,
22 Dr. Littlefield?

23 A. You mean this township?

24 Q. I'm sorry, yes.

25 A. Yes, he did.

1 Q. Okay. And he also made the statement that at one
2 point the river was 12 to 15 feet deep, correct?

3 A. I don't recall, but I'll take your word for it if
4 he did.

5 Q. Okay.

6 A. The other surveyors indicated water in some
7 cases, too.

8 This, by the way, is almost at the mouth of
9 the Gila River at the Colorado River, which would be an
10 area where you might get a lot of backflow from the
11 Colorado River.

12 Q. Now, page --

13 CHAIRMAN EISENHOWER: Ms. Livesay, before
14 you get started on a new line, it's 12:30. We're going to
15 take a lunch break. Let everybody stretch and go get a
16 bite to eat. We'll come back in approximately one hour
17 depending on the waiter.

18 (The lunch recess was taken.)

19 CHAIRMAN EISENHOWER: We're ready to resume
20 our hearing.

21 So Ms. Livesay, I'll defer to you and
22 Dr. Littlefield so you can continue.

23 MS. LIVESAY: Thank you.

24 CHAIRMAN EISENHOWER: And before we get
25 started, I do intend to finish the Gila River today, so if

1 we can move along expeditiously, I'd really appreciate it
2 and I think everybody else would too.

3 MS. LIVESAY: Thank you, Mr. Chairman,
4 members the commission.

5 (Dr. Littlefield is answering questions.)

6 BY MS. LIVESAY:

7 Q. Dr. Littlefield, I just have a few more questions
8 for you.

9 A. Okay.

10 Q. If you turn to page 52 of your report, please?

11 A. Yes, I have that page.

12 Q. At the bottom of the page you're talking about
13 the 1871 Interior Survey of Township 5 South, Range 5
14 West. Do you see that?

15 A. Yes. I should clarify in case people don't
16 understand. By "interior," I mean the surveys that were
17 done of the section lines as opposed to the surveys that
18 were done separating townships for exterior surveys.

19 Q. In this section of your report, at the very
20 bottom of the -- the last sentence that starts at the
21 bottom of page 52, you're talking about his observations
22 and his setting of posts, sometimes calling them meander
23 posts and sometimes not. Do you see that?

24 A. Yes.

25 Q. And those posts that he set, he set them on both

1 the right and the left bank of the river, correct?

2 A. I would assume so. I don't know whether he made
3 a distinction in terms of setting meander on one side and
4 other posts on the other, but yes he set them -- there
5 were posts on both sides of the river, if that's what
6 you're asking.

7 Q. Yes. And sometimes he called them meander posts
8 and sometimes he didn't, but the point is, he set them on
9 both banks of the river?

10 A. Correct.

11 Q. Okay. On the next page, on page 53, you are
12 still talking about that same section of the Foreman
13 survey.

14 A. Yes.

15 Q. And you start talking in the middle of the first
16 full paragraph about what he did being consistent with
17 1864 survey manual, and then you talk about the so-called
18 three chains rule there. Do you see that portion?

19 A. Right. And well-defined routes for internal
20 communication.

21 Q. The reference to three chains wide or more than
22 three chains wide, again, is not noted specifically by
23 Foreman in his field notes, correct?

24 A. I don't remember.

25 Q. We can go through it again, but would you agree

1 with me that you can't point me to any specific place in
2 his field notes, can you, Dr. Littlefield, where he
3 specifically references the three chain rule?

4 A. I don't remember.

5 Q. Okay. Now, you quote extensively there a
6 paragraph from his field notes on page 53 of your report.
7 And you talk in the middle of that paragraph -- the
8 surveyor says, "The Gila [River] is at times subject to
9 very high freshets, and at all times even at a low stage
10 of water as at present runs a volume of water equal to
11 about 100,000 inches." Now, 100,000 inches, Dr.
12 Littlefield, is equal to 2,500 CFS, correct?

13 A. Depends on what state you're in. Miner's inches
14 vary from state to state, and I don't know precisely --
15 and also, for that matter, did vary from mining camp to
16 mining camp. There were eventually some attempts to
17 standardize that, and I don't know specifically what
18 Mr. Foreman is talking about in terms of which state
19 standard he's using or which mining camp standard. All I
20 know is he said that it was 100,000 inches.

21 Q. Well, what was the standard for the State of
22 Arizona when Mr. Foreman was doing his survey?

23 A. I don't know.

24 Q. And then he goes on to say, "It has a fall of
25 about 20 feet to the mile in [the] township and flows over

1 a sandy bottom and is fordable at nearly all points except
2 in time of high water, when it become almost impassable
3 for boats ..." Do you see that?

4 A. Yes.

5 Q. Then he goes on to say "... which precludes men
6 from owning farms lying on both sides of the river - hence
7 the necessity for meandering the stream." Do you see
8 that?

9 A. Yes.

10 Q. And do you recall, Dr. Littlefield, that in his
11 field notes, the surveyor made reference to the river
12 having 14 inches of water in it at the time he was making
13 these observations?

14 A. I don't remember precisely. It wouldn't surprise
15 me if he did.

16 Q. And it is what it says it is in field notes, you
17 would agree?

18 A. Yes.

19 Q. Okay. Now, on the top of page 54, you quote a
20 note where, "He offered this explanation for meandering
21 only the left bank: 'Note: The left bank of the river is
22 taken by me in preference to right bank because the lands
23 north of the Gila in this township are worthless.'" That
24 statement in and of itself is not a judgment regarding the
25 navigability of the river, is it, Dr. Littlefield?

1 A. No. It's simply the explanation as to why he
2 meandered the bank he did.

3 Q. Still on page 54, you go on to 1910 Interior
4 Survey of Township 5 South, Range 8 West.

5 A. Correct.

6 Q. The survey was taken -- or was done on
7 December 14th and 15th, 1910, correct?

8 A. Yes.

9 Q. Do you have any idea, Dr. Littlefield, at that
10 point in time, how much water was being diverted from the
11 Gila River?

12 A. No.

13 Q. And would you agree with me that in that 1910
14 interior survey, Mr. Hesse was identifying fractional
15 sections?

16 A. Without looking at the actual survey, I don't
17 remember. Typically the surveys that were done later in
18 time did smaller interior fractional sections such as
19 quarter sections and so forth. So you're more likely to
20 find quarter section surveys in later surveys than in
21 earlier ones.

22 Q. Do we have the folder for township 5 south, range
23 8 west? If you look in there, hopefully the first thing
24 you'll see is pages from book 1638.

25 A. Yes.

1 Q. Okay. The second page in that portion is page 35
2 in the upper right-hand corner. Do you see the note there
3 at the top of the page, and would you agree with me that
4 that note and the next one both refer to fractional
5 sections?

6 A. Yes. This is the -- he's referring to the corner
7 between section 7 and 12. So he is referring to the
8 fractional quarter section that -- where those particular
9 sections meet or adjacent.

10 COMMISSIONER HENNESS: Excuse me. I'd like
11 to ask a question. Could you geographically, kind of,
12 describe where these townships are? It would be helpful
13 for me. Are we talking about below Phoenix? Are we
14 talking about below Safford? Where are these townships
15 that we're dealing with? What block of the -- it would
16 just be helpful.

17 MS. LIVESAY: Dr. Littlefield, I have a map
18 here with all the township and ranges on them. If --
19 maybe you can illustrate.

20 COMMISSIONER HENNESS: Just give me the
21 parameters of it. East and west.

22 MS. LIVESAY: What we have just been talking
23 about is township 5 south, range 8 west. So -- here, this
24 is township 5 south, 8 west.

25 MR. HENNESS: Where are we? Where's red,

1 Phoenix? What is the red part?

2 DR. LITTLEFIELD: It's near Gila Bend.

3 COMMISSIONER HENNESS: These areas that you
4 are talking about are west of the junction?

5 MR. HELM: All of them that we're talking
6 about in this is the lower Gila from the junction of the
7 Salt.

8 COMMISSIONER HENNESS: Okay, thank you.

9 MR. HELM: They're all located between there
10 and the Colorado River.

11 COMMISSIONER HENNESS: That's helpful for
12 me. Probably meaningless for your discussion, but it's
13 helpful for me to understand just where you're talking
14 about.

15 MS. LIVESAY: That's why over lunch I went
16 and got this out so you could have it for illustration.

17 BY MS. LIVESAY:

18 Q. Now, I just have a few questions in summary of
19 this portion, Dr. Littlefield. If you go back to page 18
20 of your report?

21 A. Are we done with this folder, township 5, range
22 8?

23 Q. Yes, we are.

24 A. I'm sorry, what page did you want in my report?

25 Q. 18.

1 A. Yes, I have that page.

2 Q. I am confused about one statement you make in the
3 middle of that paragraph relating to the 1890 manual.
4 Right in middle there's a sentence, "Surveyors also still
5 were instructed" -- are you with me?

6 A. Yes.

7 Q. "Surveyors also still were instructed to set a
8 witness post on line at the edge of the non-navigable
9 obstacle," and then it goes on from there. You do not
10 mean to imply that witness posts were only used for
11 non-navigable rivers, do you?

12 A. Are you talking about in theory or in practice?

13 Q. Well, let's start with in practice.

14 A. As I indicated in my testimony earlier, it was
15 not unusual for surveyors to sometimes call posts meander
16 posts when what they really meant was witness post and
17 vice versa. The theory, I think, is pretty well set out
18 in Mr. White's book that witness posts were only to be
19 used in relation to non-navigable bodies of water, but not
20 all surveyors were very precise about following that rule.

21 Q. So it's your testimony that Mr. White's book
22 instructs that witness posts are only to be used where the
23 body of water is non-navigable?

24 A. Mr. White doesn't make that instruction, he
25 reprints the instructions from the original manuals, which

1 I believe I'm remembering correctly, said that witness
2 posts were used on -- where they were not crossing
3 navigable -- where they were crossing non-navigable bodies
4 of water and meander posts were there crossing navigable
5 bodies of water. But in -- not all cases did they
6 religiously adhere to that instruction.

7 Q. Since the page that we looked earlier, page 461
8 of Mr. White's book -- I'm handing it to you -- where we
9 discussed the section "Insuperable Obstacle on line
10 Witness Post."

11 A. Yes, I see that.

12 Q. And that's the section that you are referring to?

13 A. Well, it depends on which survey you're talking
14 about because there are different manuals for different
15 times.

16 Q. But I thought we agreed that the language was the
17 same with respect to that section?

18 A. Not all the way through all the manuals, no.
19 It's pretty much the same in the earliest -- the manual
20 for Oregon and the 1855 and then I believe the 1864
21 instructions. But beginning with 1881, you get quite a
22 bit of variance in terms of how surveyors were to deal
23 with non-navigable bodies of water that also needed to be
24 meandered. So you cannot uniformly say that this
25 instruction, which is -- I believe it's for the Oregon

1 manual, the first one. Now the 1855 -- well, anyway, one
2 the first ones. You can't say that uniformly the
3 instructions are the same all the way through all the
4 manuals because they're not. That was the point of all my
5 discussion in my report, to make that clear.

6 Q. Dr. Littlefield, since you have the entire book
7 there, could you direct our -- or the committee's -- the
8 commission's attention to the specific instruction in the
9 appropriate portion of the manual that says that witness
10 points -- posts or corners are only to be used in
11 instances of a non-navigable river?

12 A. If you looked on page 461, the right-hand column,
13 there's a discussion about meander posts. It's item
14 number 4 under large block heading number 6. It says,
15 "Meander corner posts are planted at all those points
16 where the township or section lines intersect the banks of
17 such rivers, bayous, lakes, or islands as are, by law,
18 directed to be meandered."

19 It's my recollection that that particular
20 instruction does not include witness posts, it only
21 includes meander posts. And with relation to navigable
22 bodies of water, the witness posts were set, in theory at
23 least, in relation to non-navigable bodies of water.

24 Q. If you look over just one column to your left,
25 under Insuperable Objects on line Witness Points. Tell me

1 if the text states this: "And at the intersection of
2 lines with both margins of impassable obstacles, you will
3 establish a witness point." Does it say that?

4 A. It does. But it says "impassable obstacle," it
5 doesn't say -- the impassable obstacle that they are
6 referring to there is cumulative, it includes navigable
7 bodies of water, but it includes a lot of other things
8 too.

9 Q. Okay, thank you.

10 A. So witness posts were set in a variety of cases.
11 But as item number 4 indicates, in the right-hand column,
12 they were to use meander posts just for navigable bodies
13 of water. And I think that maybe your question
14 illustrates maybe why there was some confusion on the part
15 of the surveyors as to whether they were calling them
16 meander posts or witness posts.

17 Q. Okay.

18 A. Clearly there's some misunderstanding here too.

19 Q. As far as the surveyor's notes are concerned, if
20 they set a witness post, depending on what was going on in
21 the mind of that particular surveyor at the time he was
22 doing it, it could have related to navigability or it
23 might not have. We just don't know. Is that what your
24 testimony is?

25 A. As I indicated, there is a difference between the

1 theory and the practice, and I don't know which one you're
2 asking about.

3 Q. In practice?

4 A. As I already testified, clearly, for example,
5 Mr. Foreman used -- set meander posts in place where, in
6 my view of the historical record, he was not setting them
7 for reasons of navigability. And there were other
8 instances, not only on this river, but also on many of the
9 other rivers that I looked at in the West where there were
10 similar discrepancies. It was not at all uncommon.

11 Q. Okay, thank you.

12 Just so I'm very clear about your testimony,
13 this is the way I understand. You view the survey
14 instructions as having been progressed with respect to
15 meandering. In 1855, the surveyors were supposed to
16 meander both sides of a navigable river, correct?

17 A. Yes.

18 Q. In 1864, they could meander one bank of a
19 well-defined natural artery of internal communication?

20 A. And both banks if the body of water was
21 navigable.

22 Q. They could do both, correct?

23 A. Depending on which it was, correct.

24 Q. And in 1890, the instructions deleted the
25 internal communication instruction but they added the

1 so-called three chains rule?

2 A. Right. And that was further modified, I believe,
3 in 1901, which changed the instruction from three chains
4 or wider. In 1902, they changed it to say even for three
5 chains or less, if it's so impassable as to be worthless
6 for farmland, you can go ahead and meander that too.

7 Q. How wide is three chains, Dr. Littlefield?

8 A. One chain, a hundred -- a hundred feet. I'm
9 sorry, a hundred links, 66 feet.

10 Q. So three chains is almost 200 feet?

11 A. Ballpark, yes.

12 Q. Could you show me the places on the Gila River in
13 the lower Gila stretch that we've been talking about where
14 the river is less than three chains wide?

15 A. Are you talking about today?

16 Q. Yes. I'm asking if you can show me today.

17 A. I have no idea of how wide the river is today.

18 Q. I'm sorry, I meant to do it today. No, at the
19 time the surveys were being done between 1865 and 1912?

20 A. If you would like to go back through township
21 through township, I can do that. Without being able to
22 look at the notes and deal with them directly, I can't do
23 it from memory. There's just too much information to deal
24 with it from memory.

25 Q. Can you point out, let's say, three places from

1 memory where the river is less than three chains wide?

2 MR. MCGINNIS: Just a point of order. That
3 question has been asked and answered. We have been here
4 now two hours talking about surveys. He just answered the
5 exact same question. She asked him if he could point any
6 out, he said "No." Now, she's asking him to point three
7 out. There's not much difference between three and any if
8 the answer is no to any question.

9 MS. LIVESAY: I'm sorry, I thought he said
10 yes he could, but it would take him a long time to do it.

11 And Mr. Chairman, I'm just asking him if he
12 can do two or three for me right now without taking a lot
13 of time.

14 CHAIRMAN EISENHOWER: Well, I think he said
15 that if he went back through all the survey notes then he
16 can find it, but if you want him to do -- but is it
17 totally necessary in your estimation?

18 MS. LIVESAY: It would be very helpful to us
19 in preparation of our post-hearing memorandum to know
20 where Dr. Littlefield believes that the river was less
21 than three chains wide. And if he feels comfortable doing
22 it, I will let him just mark right on my map where he
23 thinks two or three places where it is less than three
24 chains wide.

25 COMMISSIONER HENNESS: Did Mr. Littlefield

1 offer to work with you on that whole setup? It seems a
2 bit unreasonable that you're asking him to come from
3 memory about three townships between the confluence of the
4 river and Yuma that he can tell you the width of. But did
5 he not volunteer to help you with -- --

6 MR. HELM: He can submit a list of the
7 areas, the townships that he maintains are that before our
8 30-day deadline so we have some chance to use it. We'd be
9 perfectly happy just to have that.

10 DR. LITTLEFIELD: I think I can probably
11 help out here.

12 Any list that I would submit is going to
13 include all of the townships that you already have copies
14 of the field notes to. So all you really need to do is go
15 through all those field notes and see where the surveyor
16 crossed the river on line and he will indicate whether it
17 was three chains or less and how many more or how many
18 less. It's in notes. You can do that for every single
19 township.

20 BY MS. LIVESAY:

21 Q. Okay. And if it's not in notes, then do you have
22 any other way of knowing those places where the river is
23 less than three chains wide?

24 A. My analysis only dealt with what the surveyor
25 said, and as a result, you would get as much out the notes

1 as I had already gotten by going through them myself.

2 Q. Okay, thank you. That's good enough.

3 And I would just like to ask you one last
4 question, Dr. Littlefield, if you would agree with this
5 statement, which is from the United States Supreme Court
6 case Railroad Company versus Schurmeir, 74 U.S. 272, it's
7 an 1868 decision. So for starters, you would agree that
8 1868 is within the relative time frame that these surveys
9 were being done, correct?

10 A. It was toward the beginning when they were being
11 done, yes.

12 Q. Okay. This is the statement: "Meander lines are
13 run in surveying fractional portions of the public lands
14 bounding on navigable rivers not as boundaries of the
15 tract, but for the purpose of defining the sinuosities of
16 the banks of the stream, and as the means of ascertaining
17 the quantity of land in the fraction subject to sale,
18 which is to be paid for by the purchaser.

19 "In preparing the official plat from the
20 field notes, the meander line represented as the border
21 line of the stream and shows to a demonstration that the
22 watercourse and not the meander line is actually run on
23 the land is the boundary." Do you agree with that?

24 COMMISSION COUNSEL JENNINGS: Mr. Chairman,
25 is the question as to whether he agrees the Supreme Court

1 said that in one of its opinions?

2 MS. LIVESAY: Let me rephrase the question.

3 Thank you.

4 COMMISSION COUNSEL JENNINGS: That's what I
5 understood you to ask.

6 BY MS. LIVESAY:

7 Q. Would you agree that that would be an
8 understanding that the surveyors of this time would have
9 when they were making their surveys?

10 A. I think I can answer a question in the way that
11 will help you out. I think that you misunderstand what it
12 means when it says it's a fractional survey.

13 The fractional surveys that are mentioned in
14 the surveyor's notes routinely refer to parts of sections,
15 meaning not 160 acres but parts of sections, quarter
16 sections, half sections, and so on. So when they're
17 talking about fractional surveys, in almost every single
18 instance that you brought up in any testimony here, they
19 were not talking about what were referred to as government
20 lots.

21 Government lots are the small irregular
22 parcels that you find along navigable bodies of water,
23 they are typically numbered, they are identified as
24 government lots, but they are also sometimes referred to
25 as fractional surveys because they aren't 40-acre blocks.

1 So I think you have confused the two. And to the extent
2 that my testimony or what you've brought out here, where I
3 have been asked to identify all of these fractional
4 surveys, to the best of my knowledge, none of those
5 fractional surveys refer to government lots. They do
6 refer to 40-acre blocks, 80-acre blocks or some subset of
7 a full section.

8 Q. Dr. Littlefield, my only question was, this
9 Supreme Court case came out in 1868, would you agree that
10 that decision by the United States Supreme Court
11 concerning meander lines and fractionals would be
12 something that the surveyors who performed the work that
13 we have been looking at would have been aware of when they
14 were conducting their surveys?

15 A. To the best of my knowledge, the surveyors did
16 not know anything at all about U.S. Supreme Court
17 decisions. I think they left the decisions to be
18 interpreted by the higher-ups in the Land Department,
19 which was part of the reason why they went -- the
20 higher-ups in the Land Department went back and attempted
21 to clarify through the revision of these manuals what they
22 were supposed to be doing on meanders. The surveyors were
23 experts in surveying. They were not lawyers and they
24 weren't judges. And I don't think they read Supreme Court
25 case decisions.

1 MS. LIVESAY: Thank you.

2 MR. HELM: My turn, Dr. Littlefield. Good
3 to see you.

4 DR. LITTLEFIELD: Good to see you, Mr. Helm.

5 BY MR. HELM:

6 Q. John Helm for Maricopa County.

7 Last night I pawed through the notes I had
8 prepared before I found out you had submitted a new report
9 and tried to separate some to shorten this up. And I got
10 to the point where I can get rid of these just to give you
11 some incentive if I can get a couple of questions
12 answered.

13 The first question being, do you recall
14 giving a deposition in the Gillespie Dam case?

15 A. Yes, I do.

16 Q. Okay. In that case you were an expert witness
17 for one of the parties?

18 A. I was retained by Emery Barker on behalf of -- I
19 don't remember full title of -- but Paloma.

20 Q. Paloma Ranch Interests?

21 A. Yes.

22 Q. Including those interests who owned the dam?

23 A. That's my understanding. I don't know exactly.

24 Q. Okay. At the time you were hired by Mr. Barker,
25 or at least at the time that you were disclosed, you had

1 completed your work on the first report that you did for
2 the Salt River Project, hadn't you?

3 A. On the Gila River?

4 Q. Yes.

5 A. Yes.

6 Q. And you sought the Salt River Project's
7 permission to act as Mr. Barker's expert, didn't you?

8 A. I didn't seek it personally. I told Mr. Barker,
9 he contacted me. And I told him that I didn't object to
10 doing some work on his behalf, but he would have to
11 discuss the matter with the attorneys at Salmon, Lewis and
12 Weldon and the Salt River Project.

13 Q. And they gave you permission, ultimately, to
14 serve as a witness?

15 A. Yes.

16 Q. And they used the information and documents that
17 you had prepared for the Salt River?

18 A. Correct.

19 Q. Okay. Now, on another topic -- well, let me
20 finish up on that first.

21 As a result of that employment, you
22 ultimately gave a deposition in that case, correct?

23 A. The Paloma case?

24 Q. Yes.

25 A. Yes.

1 Q. Okay. And in that deposition, quite an extensive
2 part of that took place in a review of the report you had
3 written at that point for the Salt River, correct?

4 A. I haven't read the transcript recently, but
5 that's my recollection.

6 Q. Mine too.

7 And I don't know if you're aware -- I'm
8 sure -- we filed that transcript with the commission as
9 part of our evidence in this matter. But the point that I
10 want to ask you is, do you have any of the statements that
11 you can recall making from that transcript that you want
12 to disavow as we stand here today?

13 A. Not that I recall.

14 Q. And will you stand by those statements as far as
15 they relate to the testimony that you have given here and
16 that's evidenced in the report that you prepared?

17 A. Yes.

18 Q. Well, that -- you got rid of a whole bunch of
19 them.

20 And I assume that the commission will accept
21 that transcript?

22 CHAIRMAN EISENHOWER: The deposition
23 transcript?

24 MR. HELM: Yes.

25 CHAIRMAN EISENHOWER: Yes, we have that.

1 BY MR. HELM:

2 Q. Okay. Now, just a few items I have to go
3 through, regrettably though, we may have talked to them.

4 First of all, you don't claim any expertise
5 in civil engineering, hydraulic -- hydrology,
6 geomorphology, archeology, water engineering, irrigation
7 design and delivery, dam construction, river guiding, boat
8 building, surveying, or assaying?

9 A. No.

10 Q. Now, if I understand what your testimony has
11 been, and what you told us, I believe, in the deposition,
12 you didn't use any specific legal standard to measure your
13 conclusion of navigability or non-navigability against?

14 A. Any specific legal standard?

15 Q. Yes.

16 A. That's correct.

17 Q. For example, you didn't write either your first
18 or your second report with an intent to comply with the
19 Defenders of Wildlife case prescriptions?

20 A. I don't recall if -- I think I indicated with the
21 attorney yesterday -- I don't remember her name -- but I
22 don't recall if I have read that decision, but likewise,
23 steamer Daniel Ball. I didn't write my report to comply
24 with the provisions of either one of those cases.

25 Q. I can refresh your memory, you read it at the

1 deposition.

2 A. Well, thank you.

3 Q. And it is referenced in there.

4 And the sum and substance of all that is
5 that your opinions and report shouldn't be taken as an
6 opinion of navigability comporting with any legal
7 standard. Is that fair?

8 A. You know, I testified in another case involving a
9 California river about navigability, and the attorney --
10 one of the attorneys in that case raised the same issue
11 about whether the historical parties involved, whether
12 their testimony or their writings or documents met the
13 legal standard of certain documents, certain court cases,
14 and I said no.

15 The judge in that case said you recognize
16 that historical actors hadn't been discussing their views
17 of the river with steamer Daniel Ball, but he also noted
18 that our ancestors weren't all fools and they knew whether
19 rivers were navigable or not. And I think that's --
20 essentially what I am trying to do here is, I'm trying to
21 explain what historical parties were viewing the river as,
22 not as to whether the river meets a particular legal test
23 or not.

24 Q. Sure. Could you identify the name of that case?

25 A. It's in my vitae, which is in the appendix to my

1 report. It's the Kern River case.

2 Q. Kern River case?

3 A. Well, there are several Kern River cases, but
4 it's the --

5 Q. Which one?

6 A. Nickel versus California, I believe, is the case.

7 Q. All right. Let me see if this is a fair summary
8 of what you said. I'm offering a conclusion based on many
9 other parties' opinions about what the river was like and
10 cumulatively they say to me that no matter what standard
11 you use, the river is not commercially navigable?

12 A. Cumulatively --

13 Q. Is that what you're offering?

14 A. They're cumulatively saying to me that virtually
15 every historical party involved did not view this river as
16 being consistently navigable.

17 Q. Okay. Now -- and what you're doing is telling us
18 what those people that you found quotes from or things
19 thought about it as you perceived what they're saying?

20 A. Correct.

21 Q. So this is your interpretation of what they said?

22 A. Not so much my interpretation. It's one of the
23 things that historians do, is we synthesize material. We
24 bring large amounts of material into our research. We
25 reach conclusions based on that. We present those

1 conclusions, and we present all the evidence that supports
2 those conclusions. And I think that I have done that with
3 my report. I brought a lot of material here. I've
4 synthesized it, and I've indicated, as you have just
5 questioned, that I think virtually all of the historical
6 parties, none of them thought this river between the Salt
7 River and the Colorado River was consistently or reliably
8 navigable.

9 Q. Does that include those surveyors that you just
10 finished talking with Ms. Livesay about who made findings
11 during that time period that some of it was specifically
12 navigable in their opinion?

13 A. I think you misunderstood my testimony, and I
14 would be glad clarify it.

15 Q. Sure.

16 A. My testimony did not say that they had found it
17 navigable, and you won't find anything in any of those
18 surveys notes where they do say it's navigable. In fact,
19 much to contrary. If you approach this the way a
20 historian would, instead of being selective with
21 documents, if you approach this and look at this for the
22 cumulative impact of the historical record, synthesize it,
23 analyze it, looking at the forest rather than looking at
24 individual trees, you will see that what those surveyors
25 did is they were dealing with a non-navigable body of

1 water.

2 Q. Okay. Doctor, I think you've agreed that none of
3 them said it was non-navigable?

4 A. They didn't use that word, correct.

5 Q. Exactly. And I think you've also testified that
6 they were following the directions in whatever manual they
7 were doing?

8 A. Correct.

9 Q. And all the manuals before 1891 told them to
10 meander when they crossed a boundary of a navigable,
11 didn't they?

12 A. If in their judgment it was navigable, correct.
13 But there were other circumstances that they were entitled
14 to use meanders under.

15 Q. And if it doesn't say anything else, we have to
16 look at the direction because the person who was doing the
17 surveying on the ground didn't tell us what purpose he was
18 doing it for, did he? He just did.

19 A. You have to look at the instructions as one of
20 the larger picture, but you also have to look at what all
21 the other surveyors did and all of the other historical
22 documents to put it in its proper perspective --

23 Q. Sure.

24 A. -- excuse me, Mr. Helm -- which is what I think
25 is the whole problem with the selective document thing.

1 It does not put it into the bigger picture. The bigger
2 picture is consistent and it indicates that there is
3 virtually no one who considered this river to be reliably
4 navigable, at least not between the Salt River and the
5 Colorado. And I haven't done any work beyond that, up
6 river from there.

7 Q. I'm sure that the Commission would like me to go
8 over every document that you have reviewed so that I would
9 give them the consistent picture, but we'd be here for a
10 few months, wouldn't me?

11 A. I'm perfectly willing to go through all of those
12 documents, document by document, synthesize them and
13 analyze them, as I have done in my report here. And I
14 think once you have done that, you will see that there is
15 a very, very solid presentation about whether this river
16 is navigable or not from the perspective of historical
17 actors.

18 Q. But you make a statement that you say there isn't
19 anything in there that would disagree with your
20 conclusion. And at least to the extent that some of those
21 surveyors determined that part of the Gila River was
22 navigable, one of you is inconsistent, aren't we?

23 A. None of those surveyors determined that river to
24 be navigable. Some of them did set meanders, but as I
25 have indicated over and over and over, none of them

1 indicated that they were setting meanders for purposes of
2 navigability.

3 Q. What does the 1855 set of instructions tell a
4 person to do when he gets to a river on a line?

5 A. 1855 says you will meander it if it's navigable,
6 but they didn't all use that manual. They used later ones
7 for later surveys, as I have testified repeatedly.

8 Q. What does the 1864 manual say?

9 A. The 1864 adds the clause about meandering one
10 bank if it's a route for internal communication.

11 MR. MCGINNIS: Mr. Chairman?

12 BY MR. HELM:

13 Q. And if it's a --

14 MR. MCGINNIS: Mr. Chairman, I indulged Mr.
15 Helm's request to split his cross-examination up between
16 the surveys and the other information, and we did that.
17 We spent two hours on the surveys. Now he's back taking a
18 second bite of the surveys, and I don't think that's fair.

19 MR. HELM: Well, I'll move on.

20 MR. MCGINNIS: If you want to move on to
21 something else, that's fine. We've been through the
22 surveys for, my God, who knows how long.

23 MR. HELM: I'll move on. But I didn't
24 realize that you were in control and ability to indulge --

25 MR. MCGINNIS: I'm objecting, John. That's

1 the way it works.

2 MR. HELM: That's fine. That's not an
3 indulgence. Stand up and make an objection if you've got
4 one. State what it is.

5 COMMISSION COUNSEL JENNINGS: Mr. Chairman,
6 I have an objection. Counsel continues to argue with the
7 witness. He should be asking him questions and listening
8 to answers and not trying to testify himself and argue
9 with the witness.

10 MR. HELM: Would the record also reflect
11 that the witness is arguing with counsel? It cuts both
12 ways, Curtis.

13 DR. LITTLEFIELD: Excuse me. I'm trying to
14 answer your questions, Mr. Helm, truthfully and as
15 completely as I can.

16 CHAIRMAN EISENHOWER: Let's keep to the
17 point, if we may, on both sides here.

18 BY MR. HELM:

19 Q. Now, in your report, you stated that your report
20 addresses the river in 1912?

21 A. There are historical documents, and my
22 recollection is that I have documents around that time
23 that describe the river at various times of year and
24 different places.

25 Q. And I believe you have admitted that your report

1 does not deal with the river in either a natural or
2 ordinary condition but in the condition it was in as of
3 1912?

4 A. The documents that are in my report describe the
5 river under the conditions that existed at the time of
6 those documents.

7 Q. And there was large -- large amounts of diversion
8 in the river during that period of time. Is that correct?

9 A. Depending on the time you're dealing with, but
10 yes, there were diversions pretty much during the whole
11 period my report addresses.

12 Q. And it increased over time?

13 A. Correct.

14 Q. So we get to 1912, there were a lot more
15 diversions than there were in 1850?

16 A. Correct.

17 Q. Now, at least in your first report -- and I will
18 admit when I get to your second one, I had to go through
19 it very quickly because I only had a day -- you used as
20 part of the standard to determine whether a river was
21 navigable whether commerce actually was conducted over
22 that river. Is that correct?

23 A. That was one of the things I looked at.

24 Q. And the commerce you looked at, I believe you
25 told me, was the commerce that occurred in and around

1 1912?

2 A. It was whatever commerce was mentioned or lack
3 thereof in the historical documents that I either reviewed
4 or talked about in my report.

5 Q. So in determining whether a river was navigable,
6 one of the criteria that you had for doing that is -- was
7 commerce conducted on the river, the kind of commerce that
8 was conducted in and around statehood in 1912?

9 A. If there was any commerce conducted on the river,
10 I would have examined documents to that effect.

11 Q. Was that a criteria for navigability in your
12 mind?

13 A. I tried to examine the widest possible sources of
14 historical material about the Gila, not only including
15 parties who may have used the river in various ways but
16 also including parties who viewed it. And one of those
17 things that I would have examined would have been commerce
18 as it was conducted on the river because it talked about
19 the river, and I tried to look at everything that talked
20 about the river.

21 Q. Let me read you from your deposition at page 49.

22 "Question: And your report is written
23 with your definition of commercially
24 navigable as part of your standard, right?

25 "Answer: That's correct.

1 "Question: If it wasn't commercially
2 navigable, then it wasn't navigable in
3 your opinion.

4 "Answer: Simply because both were used
5 on the river does not mean it was commercially
6 navigable."

7 A. That's what I said.

8 Q. And that's still standard -- and that's the
9 standard you use regarding the commercial requirement?

10 A. As I indicated, commerce, if it was conducted on
11 the river, I would have considered that as evidence as to
12 the characteristics of the river. Maybe my answer in my
13 deposition wasn't particularly artful, but I attempted to
14 look at the river from as many perspectives as I can or
15 could. And if there was commerce conducted on it, that
16 would have been one of them.

17 Q. Let me give you another quotation. Page 50.

18 "Question: I want you to give me your
19 definition of the difference between
20 commercially navigable and navigable.

21 Answer: Commercially navigable, my
22 understanding of it, is carrying commerce
23 on a river from point A to point B, which
24 does not include ferries because ferries
25 are a means of avoiding the river at regularly

1 expected times of the year or alternatively
2 susceptible of carrying commerce on the
3 river the way commerce was carried on -- on
4 at the time of statehood at regularly expected
5 time of the year."

6 You did say that?

7 A. I believe my answer, if I recall correctly, was
8 with regard to general questions you were posing about my
9 understanding of the issue of navigability in today's
10 sense. And I was explaining, if I remember correctly,
11 that I have indeed read some of the -- at least some of
12 the court cases that deal with navigability, and some of
13 them deal with whether commerce is one element of that.

14 Q. When you were doing your report, did you believe
15 that a river had to be used commercially for navigability
16 before a river was navigable under the equal footing
17 doctrine as it's enunciated in the Daniel Ball case?

18 A. I didn't deal specifically with the Daniel Ball
19 case. I think I made that clear in my deposition as well.

20 Q. Okay. Did you deal or -- in your attempt to
21 determine whether a river was navigable, was one
22 requirement the river had to meet -- that it had to have
23 been used for a commercial use?

24 A. What I did in my report is I presented what the
25 historical parties thought about the river. And what they

1 thought about the river was just the opposite, that it was
2 incapable of any kind of reliable transportation,
3 commercial or otherwise.

4 Q. I'm not asking --

5 A. I didn't impose my own opinion here. I simply
6 told you what the historical parties did.

7 Q. So you -- so your testimony here today is that
8 you did not -- in arriving at your opinion of
9 navigability, you did not place a commercial navigability
10 requirement on it?

11 A. You're talking about in a general sense or with
12 respect to the Gila?

13 Q. With respect to the Gila.

14 A. My intent was to present what the historical
15 parties thought of the river. And cumulatively, they
16 thought -- the vast majority of them, if not all of
17 them -- that it wasn't reliable as a means of
18 transportation, commercial or otherwise.

19 Q. Okay. Then let me see if I've got it now because
20 I have been off on a flight of fancy, maybe.

21 This isn't your -- your reports are not your
22 opinion, they're your compilation of what you think the
23 people at the time thought about the Gila River?

24 A. It's not just what they thought, it's also what
25 they said about the Gila River.

1 Q. And said.

2 A. Yes, and what they --

3 Q. Is that an accurate --

4 A. -- wrote about it, correct.

5 Q. Is that an accurate statement?

6 A. Right. And I -- and from that, I synthesize an
7 overall report that you have a copy of.

8 Q. Okay. And so it's really not your opinion, it's
9 just a synthesis of the people who wrote about it and at
10 the time they wrote about it or spoke about it -- I guess
11 you couldn't have really figured out how they thought
12 about it.

13 A. It's my opinion that the vast majority thought of
14 it as being non-navigable as of 1912 or earlier. And
15 thus, my conclusion has to be that if they all thought it
16 was non-navigable in 1912 or earlier, I can only reach one
17 conclusion from that, and that's that anybody who had
18 anything to do with the river in 1912 or earlier didn't
19 think it was navigable, commercial or otherwise. I'm
20 simply -- my opinion is reflecting what I found in the
21 documents.

22 Q. Now, with all these documents and everything that
23 you looked at -- it's kind of what I have classified in my
24 own mind as the eyes of the beholder. And what I mean by
25 that is when somebody wrote a letter in 1912 and said that

1 the river was not navigable, that was based on that person
2 looking at the river in 1912 and saying, "Look, there is
3 no water in it," right?

4 A. Right. But then this gets back to the issue of
5 whether you're looking at that one document, and I think
6 the Land Department made the same point, you need to
7 consider the reliability of that document in the context
8 of the entire universe of documents that surround it. So
9 I would also examine that document, and if it was the only
10 one that said that river is not navigable and all the
11 others said it was navigable I'd probably discount it. On
12 the other hand, if most of them said it is not navigable,
13 that would tend to fit -- influence me to believe it was
14 not navigable.

15 Q. I understand that. But what I am just trying to
16 get at is that the documents that you looked at are
17 colored by the time they were written, weren't they?

18 A. Yes.

19 Q. In other words, a person making a judgment about
20 the Gila River today who didn't have any knowledge about
21 these issues about whether we got to put the water back or
22 everything like that would go down there and say, "Look,
23 you idiots, that's nothing but a bunch of sand down there.
24 You can't put a boat in it," right? That's not navigable.
25 Fair?

1 A. Is that a question?

2 Q. Is that a fair statement of what a person would
3 say today, looking at the Gila River?

4 A. I haven't been down to the Gila River today. I
5 don't know if there's water in it or not.

6 Q. In this year?

7 A. It would be a fair statement that whenever they
8 looked at it, they were saying what they saw.

9 Q. Okay. And so in 1912, they saw a river that had
10 been fully -- or at least very seriously depleted of
11 water, fair?

12 A. I think there were a lot of diversions in place
13 by 1912, yes.

14 Q. Okay. And weren't there a lot of diversions in
15 place even by the first time that river was surveyed in
16 1861?

17 A. I don't know the exact number of diversions;
18 there may have been, I don't know.

19 Q. Did you do any research about the diversion of
20 the Gila River at any time?

21 A. No.

22 Q. And so your reports don't take into consideration
23 diversions, dams, that sort of stuff, drawing water out of
24 the Gila River that might be replaced to make it
25 navigable?

1 A. My report simply relates what parties on the
2 scene thought or said or wrote about the Gila and whatever
3 the circumstances were on that particular day as what the
4 party observed.

5 Q. Do any of the reports and things that you have
6 referred to talk about diversions of the Gila River?

7 A. As a matter of fact, if you want to go into a lot
8 of detail, my discussion of the Desert Land Act patent
9 that's in my report does deal with -- I believe it's 50
10 different Desert Land Act homestead filings. And the
11 requirement under that particular law was that diversions
12 had to be made from a non-navigable body of water, and all
13 of the parties in those patent applications cited sources
14 that related to the Gila River.

15 Q. I was going to get to this later, but since you
16 jumped right into it, I'll give you a copy of that act.

17 A. Thank you.

18 Q. All right. That's the whole Act in its original
19 form, other than it's not on the original paper.

20 A. It would appear to be the original law.

21 Q. Now, let me get you a yellow marking pen. And
22 I'd like you mark on that document where that Act says
23 that diversion must come from a navigable river -- from a
24 non-navigable, that you cannot get diversion from a
25 navigable river. The specific language that says that.

1 MR. HESTAND: Mr. Chairman, I'd like to ask
2 Mr. Helm to repeat that last verbiage that he just put out
3 again. I had a little trouble following it.

4 MR. HELM: What he said?

5 MS. LIVESAY: No, what you just said, your
6 last statement.

7 MR. HELM: He testified that the --

8 MR. HESTAND: You came back over here
9 talking about the navigable, non-navigable and I
10 couldn't --

11 MR. HELM: What, the last one -- I told him
12 that it was the original copy of the law except that it
13 wasn't on the original paper.

14 COMMISSIONER ECHEVERRIA: No, you said
15 something to the degree that you could not take -- you
16 could not divert water from a non-navigable river. Is
17 that what you said?

18 MR. HELM: Exactly. That's what his -- his
19 testimony was that the water for the Desert Land Act could
20 only be diverted from a non-navigable -- I'm paraphrasing.
21 I hope I'm not misstating what he said -- and I'm asking
22 him to take the Desert Land Act, which sets that
23 requirement, so that -- I want to know specifically what
24 he's referring to in there and yellow line the language
25 that he says that you can't divert water from a navigable

1 stream to perfect your rights under the Desert Land Act.

2 DR. LITTLEFIELD: That's not what I said.

3 BY MR. HELM:

4 Q. What did you say?

5 A. I said the Desert Land Act's requirement was that
6 you had to irrigate the property in order to obtain your
7 homestead.

8 Q. Uh-huh.

9 A. And the water had to come from a non- -- had to
10 be an appropriation from a non-navigable body of water.

11 Q. I said I was paraphrasing you. I wasn't trying
12 to say it word for word. The sum and substance of it
13 is -- did you mark that of the portion that --

14 CHAIRMAN EISENHOWER: Mr. Helm, one little
15 thing, our microphones don't travel quite as well as you
16 do.

17 MR. HELM: I'll try and stay close.

18 CHAIRMAN EISENHOWER: If you would honor our
19 microphones, please?

20 MR. HELM: Sure. I was seem to get the
21 feeling that my voice is loud, and in court, they never
22 worry about where I am because they can hear me.

23 BY MR. HELM:

24 Q. You have marked this language: Colon, "And all
25 surplus water over and above such actual appropriation and

1 use together with the public land and not navigable shall
2 remain and be held free for the appropriation and use of
3 the public for irrigation, mining, manufacturing purposes
4 subject to existing rights."

5 That doesn't say that I must appropriate
6 from a non-navigable stream, does it?

7 A. The document says what it says. It's my
8 understanding that that's the implication of that
9 statement.

10 Q. That's your interpretation, correct?

11 A. It's my understanding from what I have been told
12 from a variety of historical sources that that's what it
13 means.

14 Q. Would you please list for me and the commission
15 each historical source that you're referring to?

16 A. I can't do that off the top of my head.

17 Q. Did you ever hear of a guy named Joseph L. Sax?

18 A. No, I haven't.

19 Q. He and a guy named Abrams are a couple of lawyers
20 who write a hornbook -- do you know what a hornbook is?

21 A. I have a general idea.

22 Q. -- called legal "Control of Water Resources Cases
23 and Materials," fair enough? And let's me read you a
24 quote, see if you disagree with it. It's from chapter 4,
25 page 298 of the book.

1 sometime I'll probably say 2007, I mean, you know. I
2 fuzzy them up, but yes, I do mean 18- -- 1800s, I
3 apologize.

4 BY MR. HELM:

5 Q. Now, do you recall a discussion that we had over
6 whether travel by and of itself on a river could establish
7 navigability?

8 A. I vaguely remember that we went over that in my
9 deposition.

10 Q. And from your perspective, that wasn't enough,
11 was it?

12 A. That's correct.

13 Q. Okay. If the case law says that travel is enough
14 to establish -- and we obviously mean travel on the
15 river -- is enough to establish navigability, is there
16 evidence of such travel on Gila River?

17 A. I can't speak to case law because I'm not an
18 attorney or a judge.

19 Q. I'm not asking you to.

20 A. Well, you did include that in your question so I
21 just want to get that out of the way to begin with. I'm
22 not speaking about case law.

23 There is evidence that there were boats used
24 on the river. I think that's been pretty thoroughly
25 covered by the State, also by Mr. August, and I believe

1 some of the other parties as well. There were instances
2 of boating on the river; they were somewhat limited in
3 number, though.

4 Q. So to the extent that you eliminated those as
5 evidence of navigation, because you believe travel isn't
6 enough, the commission should take that into consideration
7 in reviewing your report if they believe travel is
8 sufficient to establish navigation?

9 A. I didn't take them out of my consideration. In
10 fact, I think you'll find they're discussed in my
11 report -- or at least some of them. But this gets back to
12 the same issue here. If you're selective about the
13 particular documents or events, it's very easy to arrive
14 at one conclusion. But if you look at all of --
15 particularly just looking at the instances of boating,
16 most of them weren't successful. And as a result, if you
17 look at the larger forest instead of looking at the trees,
18 what you're going to see is yes, there are some instances
19 of boating on the river. I mentioned them in my report
20 and described them.

21 But when you look at all the other documents
22 that relate to the river, parties believing the river not
23 to be navigable, the other instances so thoroughly
24 overwhelm the handful of times that boats were on the
25 river that I don't think it's a fair conclusion that most

1 people thought it was navigable.

2 Q. You said most of the boating was unsuccessful --
3 or not successful, I believe, were your words. Define for
4 me and the commission what you mean by the word
5 "successful."

6 A. I mean --

7 Q. Does it get me from point A to B?

8 A. I'm talking about whether the parties involved
9 believed it was successful or not.

10 Q. Not that the boat didn't get from point A to
11 point B.

12 A. Some did, some didn't.

13 Q. So your characterization of not successful is,
14 "Gee, I didn't get the laws down," not that "I wasn't able
15 to take boat and go from point A to point B."

16 A. I'm just relating what the parties said they
17 tried and what they accomplished or didn't accomplish.

18 Q. Buckey O'Neill got everything done he wanted to
19 do, didn't he?

20 A. I don't remember him precisely. I believe I
21 described him in my report.

22 Q. He's the "Yuma or Bust" fellows?

23 A. Weren't they the ones that were as happy as mud
24 turtles pushing their boat?

25 Q. Absolutely.

1 A. I would say that maybe they were happy that they
2 got there, but they wound up pushing their boat most of
3 the way rather than riding in it.

4 Q. Where did you see that they pushed the boat most
5 of the way?

6 A. Well, they pushed it part of the way.

7 Q. Okay.

8 A. I don't remember if it was most of the way or
9 not.

10 Q. That might be a little bit of an overstatement,
11 wouldn't it?

12 A. I do not know. I would have to go back to
13 original document. I try not to take things out of
14 context.

15 Q. At any rate, the boat got from A to B over the
16 course of that river, didn't it?

17 A. Some of it being pushed, yeah, it did.

18 Q. Is a requirement of navigability that you can
19 never get out of the boat and push?

20 A. I'm only relating what they said that they did.
21 I guess it was really their opinion as to whether that was
22 navigable or not.

23 Q. Well, if the goal was to get from A to B, it was
24 successful, wasn't it?

25 A. I guess you could also push it across the floor

1 here, and if you said that was successful, that would be
2 successful.

3 Q. If I was going from A to B on this floor, it
4 would be successful.

5 A. If that's what you set out to do.

6 Q. At any rate, let's go on to a steamer that ran
7 for seven years on some part of the Gila River, right?

8 A. I believe that's correct.

9 Q. Would that qualify as successful?

10 A. Depends on what the parties involved were
11 attempting to do and whether they believed it was.
12 They -- my recollection of the steamer, which ran mostly
13 on the lower portion of the Yuma, I believe it was below
14 Dome, only ran a small number of times, and ultimately the
15 attempt was abandoned anyway, so I don't know whether they
16 viewed that as successful or not.

17 Q. Do you have any evidence that it only ran a small
18 amount of times?

19 A. Other than the historical documents that discuss
20 it that are in my report.

21 Q. So that's it. If it doesn't say "small amount of
22 time" in those documents, that's your characterization,
23 right?

24 A. My recollection of the documents that I either
25 cite in my report or reviewed was that it was a small

1 number of times or short period of time.

2 Q. Let me read another quote. And I don't have this
3 as tightly organized as I would have liked to, but back on
4 the commercial issue.

5 "Question: I guess in terms of the
6 terminology of your report, when you use
7 the term "navigable," what we really should
8 add then, shouldn't we, is commercially
9 navigable."

10 And your answer is, "Correct."

11 You made that statement, didn't you?

12 A. I'll take your word for it.

13 Q. That's at page 53-54 of the deposition.

14 Now, I think you told me in your deposition
15 that your determination of navigability was tied to the
16 date of statehood. And what I mean by that is that, for
17 example, the kind of boats I'm going to consider in
18 measuring whether it's navigable are the kind of boats
19 that were being used around the time of statehood?

20 A. My understanding of what I was asked to do was to
21 look at the navigability or lack thereof of the Gila
22 between the confluence with the Salt and the juncture with
23 the Colorado River prior to and at the time of statehood,
24 which is what the title of the report says. And so in that
25 context, part of what I would have looked at are the types

1 of watercraft that were commonly used then.

2 Q. Is it your opinion that in making a determination
3 of navigability one is restricted to you looking at the
4 types of watercraft that were used in and around
5 statehood?

6 A. I think that's a legal question. I really don't
7 know the answer to it.

8 Q. If one is not restricted to that, your report
9 does not consider, for example, canoes?

10 A. I don't think they were mentioned in my report.

11 Q. Smaller boats of any kind, for the most part?

12 A. Well, I didn't --

13 Q. You get down to what's his name's Colorado -- the
14 guy who did the Colorado the first time. I'm having a
15 senior moment.

16 MR. MCGINNIS: Powell?

17 BY MR. HELM:

18 Q. Powell. You got his boat in there, right?

19 A. I mention his boat in my report, yes.

20 Q. Did you opine in your report whether Powell's
21 boat could have floated on the Gila?

22 A. No, I did not.

23 Q. Could it have?

24 A. I have no idea.

25 Q. Do you know what kinds of boats could have been

1 used on the Gila at any time from 1850 to 1912?

2 A. What types of boats could have been used?

3 Q. Uh-huh.

4 A. All of them?

5 Q. Yes. Or start with one, and we will ask about
6 another one.

7 A. I only have a general understanding of what
8 watercraft were like at the time. The purpose of my
9 report really was not to deal with -- primarily with
10 watercraft other than to the effect -- other than to the
11 extent that they related to some activity on the Gila
12 River.

13 Q. Okay. All the discussion of the steamboats in
14 your report, then, was related to the activity on the Gila
15 River of steamboats using the lower Gila River around
16 statehood?

17 A. I thought it was relevant to show what the nature
18 of steamboats were at the time because there had been one
19 on the lower Gila River.

20 Q. How much water do you recall a steamboat needed
21 to use the Gila?

22 A. I believe that the description of some of those
23 steamboats were a foot, possibly a little bit more than
24 that, of draft. Maybe 2 feet. I don't remember exactly.

25 Q. Now, in that context, you mentioned that you

1 thought that they had gone to Dome. Do you or can you, as
2 you stand here, point me to any historical document that
3 would say that? That was the limit of the steamboat's
4 travel?

5 A. The discussion in my report about the steamboat
6 going up the Yuma River does name a particular place where
7 ultimately the craft was abandoned and, I believe, washed
8 into a sandbar and partially covered by the movement of
9 the river. And I think it does identify that place. I
10 don't think it -- I may be remembering wrong, but I don't
11 recall specifically whether other locations were mentioned
12 other than the fact that it left from Yuma going upstream.

13 Q. That was on the Colorado River where it crashed
14 and burned, wasn't it?

15 A. I'm not sure. I think the one on the Gila was
16 different one than the one that you are thinking of,
17 though.

18 Q. Are you referring to the occasion where -- the
19 accounts that you have in your report talks about a
20 steamboat coming out of the Gila and getting swept by the
21 water it ran into coming down the Colorado and ending up
22 somewhere down the Colorado tied to a tree and then the
23 tree fell in the water?

24 A. I believe that's -- I believe that's a
25 description. I don't recall precisely where the location

1 was.

2 Q. And the boat washed down farther and then it
3 washed up on shore and then, gosh, it was a flood and the
4 river moved so the boat was now six miles from the river
5 or some distance that doomed it?

6 A. I don't think I was that detailed in my report,
7 but I think you're talking about the same thing.

8 Q. Okay. My overdramatic description of it does
9 refresh your memory, though?

10 A. I think it's a bit of an exaggeration.

11 COMMISSIONER ECHEVERRIA: Never.

12 BY MR. HELM:

13 Q. Is it fair to say that your study of the lower
14 Gila -- if you let me use that phrase, from the confluence
15 of the Salt -- didn't include any determination if any
16 subset of that river could have been navigable in and of
17 itself?

18 A. I didn't address that question directly. I just
19 related what the historical parties said about certain
20 parts of the river at certain times in the past.

21 Q. So if steamboat running for seven -- seven years
22 up some distance of the Gila makes it navigable, you
23 wouldn't have any opinion on whether that portion should
24 be navigable on or not because parties acknowledged that
25 steamboat ran up the Colorado?

1 A. I related what the steamboat did in my report.

2 Q. Now, we talked about Defenders of Wildlife case
3 in your deposition because you had an opportunity as you
4 sat there to read it, correct?

5 A. I believe that's what you said a moment ago.

6 Q. If you have any doubt about it, I can read you
7 where you say that.

8 A. I'll take your word for it.

9 Q. In there, we talked about one of your opinions
10 being that railroads and roads running parallel to a river
11 would establish that the river was not navigable. And you
12 agreed that that wasn't in accordance with the description
13 of the Defenders case, fair enough?

14 A. I don't remember that. I don't believe I agreed
15 that the mere presence of railroads indicated navigability
16 or non-navigability. I said that when you looked in the
17 larger picture of the historical record, it's one element
18 to be considered as to whether there were alternative
19 means of transportation.

20 Q. Let me read you your quote. Page 114 of the
21 transcript.

22 "Question: That opinion that you
23 hold about roads and railroads confirming
24 non-navigability is not in accordance with
25 the Defenders opinion, is it?"

1 "Answer: The Defenders opinion?

2 "Question: The case that you just read.

3 "Answer: No, it's not."

4 Do you have any reason to believe that you
5 didn't make that statement in your deposition?

6 A. No. If you say it's there, I guess it's there.

7 Q. I'd like to show it to you if you don't --

8 A. No. I believe you. If it says it's there, it's
9 there.

10 Q. Let's talk about -- and I got to kind of run
11 through your second report. These were the questions I
12 had for you from before, but some will overlap, and
13 therefore we'll get through this a lot quicker. So let's
14 have at least a little chat about your thoughts on patents
15 and what they show, okay?

16 A. Okay.

17 Q. I believe it's your conclusion that a federal
18 land guy selling land would have put in the patent he gave
19 to that land an exception for the lands that were under a
20 navigable river. Is that fair?

21 A. No. What I said was that they didn't accept the
22 land from the patent that they issued. I didn't say
23 whether they would have or wouldn't have. I just said,
24 "This is what they did." They didn't do it.

25 Q. Okay. Now, assume that the law says that if

1 you're the federal government and you are in prestatehood
2 times deeding away a piece of ground, that deed does not
3 convey title to any land under a navigable river unless it
4 says it does.

5 A. I don't understand your question.

6 Q. Let me try it again. Assume that the law of the
7 United States, either in statute or Supreme Court case law
8 or lower court case law, says if an officer of the federal
9 government, the man working in the land office, deeds away
10 a piece of property owned by the federal government and
11 includes in the legal description a river that is not
12 navigable -- I'm sorry, a river that is navigable, that
13 does not convey any title to lands underlying that
14 navigable river, all right? Do you understand it now?

15 A. I believe that's a legal conclusion. I don't
16 think I can answer that.

17 Q. I just want you to assume that that's the law.

18 A. Okay.

19 Q. Okay. I don't want you to tell me whether it is
20 or not. I'm not asking you to tell me that. I'm telling
21 you to assume that's the law. If that was the law, back
22 when these 20 patents were issued that you talk about --

23 A. Actually, I think it's several hundred that I
24 reviewed.

25 Q. Several hundred. Why would an officer of the

1 federal government need to accept from that deed those
2 lands underlying the waters of a navigable water?

3 A. I'm only telling you what they did. I don't know
4 why they did it. I believe that they were following
5 whatever instructions they had at the time, which were the
6 different homestead laws. And then they had
7 administrative instructions about how to record -- accept
8 the paperwork and record the filing of the patent.

9 Q. But the point being that they would be doing a
10 somewhat needless act if it didn't convey title anyway?

11 A. I think it's purely speculative. I have no way
12 of being able to answer that question. I'm a historian.
13 I tell you what's there. I don't tell --

14 Q. You didn't get any advice from your counsel or
15 anybody else or read any cases or check any statutes that
16 told you what the law was on title to lands under rivers
17 in preparation for doing your report?

18 A. No. As a matter of fact, I didn't.

19 Q. So the assumptions and conclusions that you draw
20 as to what that patent tells us are your assumptions and
21 your conclusions?

22 A. No. They're what the patents say and the patent
23 files say. The documents say what they say, and I relate
24 that in my report.

25 Q. But how does that get you to non-navigability?

1 They don't say the river is not navigable.

2 A. It is a reflection on the part of individuals at
3 the time as to what they thought they were granting title
4 to. And to the extent that that has some bearing on title
5 to the beds of the river, to me, it seemed to be relevant
6 because it's property that's along the river.

7 Q. If I know I'm not going to -- that the law says
8 I'm not conveying that property to you, why do I need to
9 have to write it in a deed?

10 A. I don't know the answer to your question. I'm
11 just telling you what's in the patent files. And I have
12 reviewed several hundred of the applicant files, their
13 witnesses' supporting documents, court filings that are in
14 those papers, the actual deeds themselves, testimony by
15 claimants. I'm just telling you what is in those
16 documents.

17 Q. Was there any requirement in federal law or any
18 document that you reviewed that said, "Officer of the
19 federal government, you must, when conveying a patent from
20 the United States prior to statehood, except out the lands
21 that are under a navigable waterway"?

22 A. If there had been such a instruction, I would
23 have included it.

24 Q. In your report -- I can't remember all the
25 places, but one anyway being 70-71, you talk about violent

1 and erratic river. And I'm not sure whether it's -- it's
2 got to be first report that I'm talking about since I
3 didn't have that one when I prepared.

4 A. I don't think it's on my version of 70 and 71.

5 Q. On your original report?

6 A. If you say so.

7 Q. I do.

8 Okay. And I asked you about that language,
9 and you told me that that was a reference to the Gila
10 River in flood stage?

11 A. That's what one of the parties stated the river
12 was like.

13 Q. Okay. In flood stage?

14 A. Yes.

15 Q. Okay. Did you do any research to determine how
16 much on average of a year, let's say, from 1850 to 1912
17 the Gila River was in flood stage?

18 A. No.

19 Q. Now, all the patents that you discuss in both
20 your first and second report are discussions about patents
21 that were issued after diversions had taken place on the
22 Gila River?

23 A. That's correct. I believe that not all of them
24 were, there some issued before and some after.

25 Q. It grew and grew and grew as time went on, but

1 when you get to some of your later dated patents I think
2 we were up past -- 20 years past statehood.

3 A. Yes.

4 Q. Somewhere in that neighborhood?

5 A. Yes.

6 Q. I mean, that river is totally diverted, isn't it?

7 A. I don't know the exact diversion appropriation
8 filings or how much is diverted or not diverted at any
9 particular point in time.

10 Q. With respect to --

11 CHAIRMAN EISENHOWER: Mr. Helm?

12 BY MR. HELM:

13 Q. With respect to the patents that you reviewed
14 that were issued after statehood, if that -- federal
15 patents issued after statehood -- if that was a navigable
16 stream, the federal government wouldn't have had anything
17 to convey, would they?

18 A. I don't know whether they would or not. I just
19 related what was in the patent file and the application.

20 Q. Would you agree with me that the federal
21 government lost all title to the rivers under navigable
22 waterways on the day of statehood?

23 A. I think that's a legal conclusion. That's part
24 of what I think the commission is to diagnose here.

25 Q. Do you dispute that as being the law?

1 A. I can't answer your question, it's a legal
2 conclusion.

3 Q. All the contemporaneous observers that you talked
4 about did not view the Gila River in its ordinary and
5 natural condition, did they?

6 A. Meaning what?

7 Q. Ordinary and natural, prior to any diversions
8 taking place on the river done by man. "Man" being
9 western man?

10 A. I believe all the parties that I discuss, with
11 the possible exception of some of the Spanish explorers,
12 were -- and maybe some of the early military explorations
13 too -- I think they may have been here prior to Anglo
14 diversions, but I think the bulk of the parties that I
15 discuss were at around the time of the beginning of
16 diversions and as those diversions increased.

17 Q. There's nothing contained in your report that
18 would lead us to be able to figure out what the river
19 would have been like if those diversions hadn't been made,
20 is there?

21 A. There are descriptions by some of the Spanish
22 explorers that I mentioned in my report and some of the
23 military expeditions. The way they saw the river at
24 certain times without -- without Anglo-American
25 diversions, there may have been diversions by the various

1 tribes along the river.

2 Q. Those aren't normal and natural either, are they?

3 A. I guess that depends on your definition of
4 "normal and natural." They were there by virtue of human
5 activity, if that's what you mean.

6 Q. Exactly. I will -- I'll take that.

7 Now, in doing your work, did you look at the
8 USGS water maps prior to making any conclusions about
9 navigability?

10 A. I'm not sure which maps you mean.

11 Q. The United States Geological Survey water maps.

12 A. You mean today's maps?

13 Q. The ones that they -- they've been doing them
14 since -- I can tell you in about two seconds if you want
15 me to ask Lynn -- but well before statehood in Arizona.

16 A. The sources I cited are either discussed directly
17 in the text or there is approximately 75 or 100 pages of
18 appendices that list all the sources that I also looked at
19 and, if they are in those appendices, then I looked to
20 them.

21 Q. Let me refresh your recollection.

22 A. Okay.

23 Q. Page 139 of your deposition.

24 "Question: Did you look at any USGS
25 or other water maps in making your conclusion?"

1 "The water maps themselves?"

2 "Yes.

3 "Answer: No, I did not."

4 A. I think I was probably confused about what you're
5 asking. I'm not sure even know if you're asking about the
6 current USGS topo maps or if this is some other type of
7 map.

8 Q. Doctor, did you have a opportunity to review that
9 deposition?

10 A. Not since -- I read it shortly after it was
11 taken, but I haven't read it since then.

12 Q. Were you confused when you read it?

13 A. I don't remember.

14 Q. You had an opportunity to write, "I'm confused.
15 This question is confusing," when you reviewed it, if you
16 wanted to, didn't you?

17 A. Yes, I did.

18 Q. You didn't do that, did you?

19 A. As I said, I haven't read the deposition so I
20 don't know.

21 Q. You don't recall making any corrections to it?

22 A. Not that I recall.

23 Q. Do you accept the USGS water maps and Bureau of
24 Reclamation maps as authoritative?

25 A. Don't recall using the USGS water maps. In

1 general, I think the USGS records and Bureau of
2 Reclamation records are accurate for what they are set
3 forth -- attempting to do.

4 Q. Do you agree that if I could use the river for
5 some period of time, even in flood stage, it could be
6 navigable?

7 A. I think that's a legal conclusion. I can't
8 answer your question.

9 Q. You have no idea?

10 A. It would depend on what your standard is and what
11 you're trying to do and who's asking and why they're
12 asking and under what legal definition. In my view, it's
13 not very specific.

14 Q. Did you come across any accounts of anybody using
15 the river in any heightened stage of flow?

16 A. Meaning in a flood?

17 Q. Heightened stage of flow.

18 A. I don't remember precisely.

19 Q. We have a funny problem in Arizona defining
20 floods sometimes, because currently if there's water in
21 the Salt River, you'll find a lot of people who will say,
22 "That's a flood." So that's why I use the word heightened
23 state of flow.

24 A. I don't recall.

25 Q. There were a lot of ferries that were there, at

1 least under your view, because of floods?

2 A. Well, not because of floods, but because they are
3 needed for getting across water in the river. I don't
4 know about floods.

5 Q. If it was dry, you didn't need a ferry?

6 A. Correct.

7 Q. At the time that I took your deposition, do you
8 recall telling me that you were not aware that the Gila
9 River in modern times had been used for boating and float
10 trips and that sort of stuff?

11 A. Even to today, other than what testimony has been
12 presented here, I don't know anything about the modern use
13 of the river for boating.

14 Q. Do you recall telling me that the difficulty of
15 navigation doesn't disqualify a river from becoming
16 navigable?

17 A. I don't recall that precise statement. If I said
18 it in my deposition, then it's in my deposition.

19 Q. I will tell you it is at page 155. You don't
20 disagree with that?

21 A. I don't disagree that it's there.

22 Q. For example, the Colorado is a navigable river,
23 at least if you thought about Mr. Powell, he had a little
24 difficulty getting through there?

25 A. Correct.

1 Q. Now, in your report, you characterized boat trips
2 as novelty items, fair?

3 A. Yes, I have.

4 Q. I think you used the word "novelty" at one point.

5 A. That would be fair.

6 Q. Now, just because it's a novelty, doesn't mean it
7 didn't happen, does it?

8 A. That's correct.

9 Q. It may be unusual, but if I got a boat from point
10 A to point B, I have navigated between point A and
11 point B, haven't I?

12 A. Yes, you have.

13 Q. If I did that on the Gila River, on whatever
14 stretch that would be, that would mean that I have
15 navigated the Gila River from point A to point B, fair?

16 A. That's correct.

17 Q. To the extent that boating took place on the Gila
18 River, what does that say about the susceptibility of the
19 Gila River to navigation?

20 A. I think that's a legal conclusion. I simply
21 pointed out that there were instances where parties had to
22 have boats on the river and at least under those
23 circumstances, it was susceptible for those parties,
24 either not successfully or successfully, depending on what
25 they did.

1 Q. To the extent that we went from point A to point
2 B, that would indicate the Gila River was susceptible to
3 navigation by a boat?

4 A. That's a legal conclusion. I can't answer that.

5 Q. Let me read you another quote from your
6 deposition, this occurs on page 163.

7 "Based on that case" -- I'm referring
8 to the Defenders case -- "are there certain
9 portions of your report that don't comply
10 with the standards set out in that case?

11 "Answer: You mean the descriptions
12 of the contemporaneous observers?

13 "Question: Well, for example, the idea
14 of having to have the use of the river be
15 of a commercial nature measured by the
16 nature of watercraft in use in 1912 or
17 thereabouts.

18 "Answer: Yes, that's correct."

19 You disagree with that statement now?

20 A. I'm not sure what your question is.

21 Q. I just -- you made that statement in your
22 deposition, do you disagree with it?

23 A. I don't remember what's in the Defenders case so
24 I don't know whether I currently disagree with it.

25 Q. You don't have any reason to believe that what

1 you said there should be changed at this point?

2 A. I don't remember what's in the case so I can't
3 give you an opinion on that.

4 Q. Do you have any opinion of the navigability of
5 the Gila River if man-made obstructions are removed?

6 A. No, I don't.

7 Q. Did you ever attempt to compare the Bureau of
8 Reclamation or USGS records of flow of against what the
9 surveyors indicated in their notes the river looked like?

10 A. My recollection is that, at least for some of
11 those surveys, they were done a long time before --
12 certainly before the Bureau, the Bureau didn't exist
13 before 1902. And I think some of the other surveys were
14 done quite a bit before any USGS records were done too.
15 So the short answer to your question is no, I didn't
16 compare them.

17 Q. And just one follow-up question on that. But
18 those records have been available for an extremely long
19 time, particularly to some of the surveys that you've
20 indicated were done in 1912 or thereafter?

21 A. Those records are largely engineering records,
22 and I don't feel that I'm qualified to use them.

23 Q. Okay. Now, Doctor, one question that might get
24 me along quite a ways. Do we have listed in the appendix
25 to your most recent report all of the documents that you

1 are relying on for the statements contained in that
2 report?

3 A. The appendices list, to the best of my
4 recollection, everything that I looked at. The documents
5 that I relied on I tried rather specifically to indicate
6 in the footnotes. So I didn't want to be put in the
7 position of putting words on the paper that weren't
8 documented by a particular document. So the footnotes
9 tell you which ones my report discusses and then the
10 appendices tell you which -- either in some cases there
11 are specific documents, such as titles of reports, and in
12 other cases, there are collections of documents, such as
13 files and archives, and that type of thing. The
14 appendices tell you what I looked at but not necessarily
15 what wound up in my report.

16 Q. In sum and substance, if we look at both, we got
17 everything. That's all I want to know. Do I have to look
18 anywhere else?

19 A. I think that's pretty accurate. I don't know
20 that I cited the photos that I put in the recent report,
21 but those are identified in the captions.

22 Q. On page 2 of your current report, you have a
23 little discussion about the equal footing doctrine.

24 A. Yes.

25 Q. Historically speaking, could the standard be

1 different for two states for determining what a navigable
2 river was?

3 A. I believe my understanding is that the -- one of
4 the controlling factors is the date of statehood, and I
5 think I indicated that in my report. It depends on when
6 the state came into the union.

7 Q. So if the state comes into the union, for
8 example, like Arizona -- and let me exaggerate a little
9 bit -- the original Queen Mary was in the river. We've
10 got to use the Queen Mary to test the navigability of our
11 rivers, whereas the state of Massachusetts, which was a
12 colony and tested its rivers with a canoe, gets to have
13 its rivers determined for navigability with the canoe?

14 A. I think that's a legal conclusion. I can't
15 answer that for you.

16 Q. That wouldn't be equal, would it?

17 A. It's equal to the extent that they are both
18 relying on the date of statehood of their respective
19 state.

20 Q. The methods to determine that equality wouldn't
21 be equal, would it?

22 A. That's beyond the scope of my training. The
23 equal footing doctrine, the way I understand it, is a
24 reference to the date of statehood and what the test is
25 beyond that is a legal determination.

1 Q. You have no idea whether the tests should be
2 equal for all states?

3 A. Beyond what I have explained now, no, I don't.

4 Q. And to the extent that there may be some language
5 contained in your report dealing with the equal footing,
6 as you stated here, you don't have an awful lot of
7 knowledge of that, you think that's a legal problem?

8 A. I believe I explained that question just a minute
9 ago.

10 Q. Tell me what happens -- first, let me back up.

11 You would agree with me that there are
12 watercourses throughout the United States -- one
13 particularly comes to mind in Alaska -- that were
14 determined to be navigable after that state became a
15 union -- came into the union?

16 A. I have a vague recollection that there was a
17 court case. I believe it was a U.S. appellate court case
18 that dealt with the lakes in Alaska, but I really don't
19 remember the specifics or the legal issues or anything
20 else about it.

21 Q. Well, assume that that's the case, okay? Because
22 I know it is, and so I'm comfortable giving you this
23 assumption. And assuming that, tell me what happens to
24 the lands that are determined to be -- are under a
25 navigable water that the determination is made after

1 statehood?

2 A. I have no idea.

3 Q. Do you know whether they go to the state or
4 whether the owner of the land that's got the deed for them
5 gets it?

6 A. I have no idea.

7 Q. Okay. You don't know whether those lands would
8 appear on a patent?

9 A. No, I don't.

10 Q. It would be unlikely, wouldn't it?

11 A. I have no idea.

12 Q. Wouldn't have been known to be navigable at the
13 date of statehood?

14 A. I haven't investigated that particular issue.

15 CHAIRMAN EISENHOWER: Mr. Helm, are you at a
16 convenient break point?

17 MR. HELM: Whenever you'd like.

18 CHAIRMAN EISENHOWER: I think we'll give our
19 court reporter a break for his fingers, so we'll take a
20 few minutes.

21 (A recess ensued.)

22 CHAIRMAN EISENHOWER: Okay. We're ready to
23 go back. Let us reconvene again.

24 And, John, if you will, would you wrap it up
25 in about 15, 20 minutes so that we -- we've got two

1 witnesses -- we have two other witnesses from out of town
2 that wish to speak and it's quarter to four already.

3 MR. HELM: I'll give it my best shot. I
4 understand where you're coming from, but I've got a record
5 that's got to go up to a court. And if I don't get it in,
6 it doesn't go up to the court. In all deepest respect for
7 you guys, I don't want to be here either. I would rather
8 go home and eat dinner. But I've got a job to do, and
9 I'll try -- I've eliminated half of it. I've already cut
10 an hour out of it. I have to -- and I'm still eliminating
11 because some of it I have covered, but I have to get
12 through his report.

13 CHAIRMAN EISENHOWER: I know. But some of
14 the questions seem like they've become repetitive.

15 MR. HELM: I'll try to avoid those as best I
16 can. I'm just not organized because I'd only had this
17 for -- I had to do it in the margins, not on nice little
18 legal sheets where I could --

19 CHAIRMAN EISENHOWER: If you would move it
20 along rather rapidly because we're --

21 (Dr. Littlefield is answering questions.)

22 BY MR. HELM:

23 Q. I take it that you would consider whether travel
24 was necessary to be navigable to be a legal question and
25 you would have no opinion on it?

1 A. That's correct.

2 Q. Same for what kind of watercraft we should use to
3 judge navigability?

4 A. Yes, that's correct.

5 Q. Are you sure? On page 56, you state that the
6 USGS didn't start mapping until 1912. Are you sure of
7 that?

8 A. Page 56 of what? The current one?

9 Q. Your second report.

10 A. Are you talking about the middle paragraph in
11 that report under subheading A?

12 Q. I'm talking about -- yes, the thing starts "The
13 U.S. Geological Survey ..."

14 A. To the best of my knowledge, they did not
15 undertake any topographic surveys of the Gila River region
16 prior to 1912.

17 Q. Okay.

18 A. There were some early quadrangles that were done,
19 but those were post-1912. If there were earlier ones, I'm
20 not aware of them.

21 Q. That's just with respect to topographic mapping,
22 not any other kind of mapping, i.e., water mapping?

23 A. Yes, it's with regard to the topographic maps of
24 scale 1:24,000 and 1:100,000.

25 Q. Now, at page 57 of your report, you talk about

1 comparing various survey plats to indicate that the
2 channel had moved around a lot.

3 A. Yes.

4 Q. How does channel movement affect the ability to
5 navigate?

6 A. It's one of the elements that I would look at on
7 the assumption that if you don't have a reliable channel
8 to bring a boat up, then it's not -- probably not going to
9 be navigable. And I think Dr. Schumm talked about that
10 and several of the other parties as well.

11 Q. Assuming all things equal in terms of depth,
12 width -- I mean, the channel moves a mile to the West, but
13 it's reasonably dimensional -- reasonably to the one
14 before, how would that impair navigability? The first guy
15 down there would be able to look up and say, "Hey, we're a
16 mile to west," but his boat would still be going, wouldn't
17 it?

18 A. Right. And I put the information in because I
19 thought it was what contemporaneous observers -- what they
20 were saying about the nature of the channel, and I wanted
21 to include as many observations about the river as
22 possible. I thought it had some relevance to the issue of
23 navigability.

24 Q. But it's not an opinion that you're expressing on
25 the inability to navigate just because the channel moves?

1 A. No, it's part of this larger picture that I keep
2 bringing you back to, that you need to look at the overall
3 impact of the historical record.

4 Q. Would you agree with me that once I know the
5 corners of a township, for example, I don't need to survey
6 any more of that township to write legal descriptions for
7 sections?

8 A. I don't think so, no. As I already testified,
9 I'm not a surveyor. But I think the more detail you could
10 provide about subdivisions, the fractional portions of a
11 section, the better your legal descriptions are going to
12 be.

13 Q. Doctor, please, listen to my question. Would you
14 agree with me that once I know the exposure points of a
15 township that has been surveyed, that I can write the
16 legal descriptions for the sections within that township
17 without having to presurvey them?

18 A. I think you could make an estimation of it. It
19 seems reasonable to me.

20 Q. One mile east, one mile south, one mile west,
21 one mile north, right?

22 A. Right.

23 Q. All from a point located at such and such with a
24 degree and a thing and by putting in an appropriate enough
25 person who is familiar with that lingo can do it?

1 A. Well, the townships are 36 sections, not
2 one mile --

3 Q. I was just using that as an example.

4 A. -- just use six miles each way.

5 Q. Sure. I don't mean that to be --

6 A. Yeah.

7 Q. What you have to survey for is to locate where
8 that legal description is, right?

9 A. And the other purpose of the survey was to
10 identify the characteristics of the land through which the
11 survey was being done.

12 Q. That may be a purpose of those surveys, but I'm
13 just talking generally about surveys.

14 A. Yes.

15 Q. And so in terms of patents, particularly patents
16 in the early west, once I had -- what do we call it, the
17 cadastral survey?

18 A. Cadastral.

19 Q. The one that does the townships. Once I had
20 that, if I was so inclined, I could have been started off
21 merrily selling sections of land, couldn't I?

22 A. I don't know how to answer that question. You
23 can provide a description of the land involved.

24 Q. And then we could find where it was later, right?

25 A. Yes.

1 Q. Now, at page 64, you state, "However, the patents
2 which appear on these exhibits are representative of
3 settlement patterns throughout the Gila River Basin below
4 the Salt River." And my question is, I'd like to know how
5 you know that?

6 A. I looked at -- had obtained all the original
7 patents for lands in sections through which the river
8 flowed from the Salt River down to the Colorado River. I
9 obtained all of those patents. I also obtained all of the
10 patent files that relate to those patents, they come from
11 two different sources. Patents come from BLM in Phoenix
12 and the patent files you get at the National Archives.

13 What I mean by settlement patterns, as I
14 explained in my direct testimony, was that I knew from the
15 sheer length of the river I was not going to able to
16 discuss every single patent along the entire river. And I
17 wanted to get a good sampling where there were relatively
18 large numbers of patents so I would be able to say
19 something a little bit more concrete about those samples.
20 But I did look at all the patents and all of the patent
21 files and nothing conflicts with anything I presented in
22 my report.

23 Q. Did you do a statistical analysis of these
24 patents that you used as they relate to all of the patents
25 to determine whether that is -- what you're stating and

1 what you reviewed was statistically significant?

2 A. I didn't do a statistical analysis, but I don't
3 think you needed to.

4 Q. That's good enough. I just asked if you did --

5 A. I'd like to answer your question, if I might.

6 Q. The question was did you do it, and the answer is
7 yes or no.

8 A. I think it needs clarification, if you don't
9 mind.

10 Q. Well, you've got a fellow over here who will be
11 very happy to --

12 MR. MCGINNIS: We've been here for
13 four hours. I think you can indulge him and let him
14 answer the question.

15 CHAIRMAN EISENHOWER: Go ahead.

16 DR. LITTLEFIELD: I think if you look at
17 the -- what are known as the master title plats and the
18 historical indices, which identify how the U.S. government
19 disposed of the public domain or otherwise encumbered it,
20 you could count up without using a statistical analysis
21 which townships had more homestead patents in them in
22 certain times than others, and that's what I did.

23 BY MR. HELM:

24 Q. And so how many did you look at as compared to
25 how many there were?

1 A. I don't know exactly. I looked at several
2 hundred of them total. I don't remember the exact number.

3 Q. So did you look at all of them or just several
4 hundred?

5 A. I looked at all of the ones that were in the
6 sections that either the river flowed through directly or
7 that was immediately adjacent to.

8 Q. Okay. So you didn't look at all of them?

9 A. All of them with that qualification. If the
10 river went through it or was near it.

11 Q. Did you state that in your testimony earlier?

12 A. I believe it's in my report.

13 Q. On page 65 of your report you state, "The acreage
14 is significant because if the Gila River had been
15 considered navigable, federal officials presumably would
16 not have granted title to any land through which the river
17 flowed." Whose presumption are we talking about there?

18 A. Well, I have looked at other rivers for navigable
19 purposes. And some of those rivers have, in fact, been
20 navigable by pretty much any reasonable standard. And
21 titles to the bed were -- to patents that were immediately
22 adjacent to the river did not convey title to the river.

23 Q. Doctor, I asked you whose presumption that was.
24 We really are going to be here till 12 o'clock tonight if
25 you won't answer my question, okay? Whose presumption was

1 it you're referring to?

2 A. I'm assuming that if the land granting office had
3 known it was navigable and understood the applications of
4 that with respect to state title, they wouldn't have
5 granted title.

6 Q. And that's your assumption?

7 A. Yes.

8 Q. Do you have any document that backs up that
9 assumption?

10 A. Other than my experience in -- on other rivers in
11 the west, no, I don't have one right here.

12 Q. Is it your testimony that the federal government
13 has never issued a land patent that didn't include a legal
14 description that covered navigable lands?

15 A. I don't know the answer to that.

16 Q. You'll probably tell me this is a legal question
17 and you don't have an answer, but I got to ask it anyway
18 so we can at least get on the record that you don't have
19 any opinion.

20 What is the effect of general law of the
21 United States on a issued patent?

22 A. That's a legal question, and I can't answer it.

23 Q. Okay. Have you ever heard of the concept that
24 incorporated in the documents that a government issues are
25 its laws?

1 A. No, I haven't.

2 Q. Now, Doctor, you talk about patents -- and I'm
3 just looking here. I'm not sure, but I think this is the
4 latest date, 1952, right?

5 A. I don't remotely recall.

6 Q. Woods-Harrelson patent file?

7 A. If you say so. I don't recall.

8 Q. Page 70 of your report?

9 A. Who is the party that you're talking about?

10 Q. Woods-Harrelson patent file, the last paragraph
11 on the page.

12 A. Yes, I see that.

13 Q. Okay. That's dated 1952, correct?

14 A. Correct.

15 Q. I take it by that, that you would find it
16 historically appropriate to look at a span of time, when
17 deciding what was navigable, of 40 years at least on each
18 side of the date of statehood?

19 A. What I should do is explain that because this was
20 a particular exhibit that I had on those blow-up maps, and
21 I was discussing some of the other patents that were much
22 earlier in that township, I thought I had an obligation to
23 discuss all of them, or at least to consider them in what
24 I wrote so that I wasn't leaving something out.

25 Q. Well, on page 69, you talk about patents in 1931,

1 don't you?

2 A. Yes, that's correct.

3 Q. All I'm trying to find out is, is it appropriate
4 to look at things that happened 40 years after statehood
5 to determine whether a river is navigable at statehood?

6 A. I think it's appropriate to provide you with them
7 and --

8 Q. And let the commission make the --

9 A. Decision, correct.

10 Q. It's appropriate evidence?

11 A. Yes.

12 Q. I take it that you would admit that you are not
13 an expert in either Arizona groundwater law or Arizona
14 surface law?

15 A. That's correct. I'm not an expert in either one.

16 Q. Now, you talk about Hefley's file, page 77 of
17 your report?

18 A. I'm sorry, page 77, but I didn't hear the part?

19 Q. Hefley, I believe, is the fellow's name. I could
20 be mispronouncing.

21 This is in regard to the appropriation of
22 water from the Gila River?

23 A. Yes.

24 Q. And if I've got this right, June 11th, 1946 is
25 when we're talking about?

1 A. That's that date that an examiner from the
2 Department of Interior's grazing service submitted a
3 report about the patent.

4 Q. That's roughly when he's seeking the patent in
5 terms of the year 1946?

6 A. He declared his intent to seek the patent in
7 1945.

8 Q. Fair enough.

9 In 1945, Mr. Hefley could not, under the
10 laws of the State of Arizona, as far as you know -- or do
11 you know if Mr. Hefley, under the laws of the State of
12 Arizona, could have appropriated water from the Gila River
13 in 1945?

14 A. I don't know the answer to that question.

15 Q. If he could not have, then would this discussion
16 have any significance in terms of whether the Gila River
17 was navigable?

18 A. Yes. It would to the extent that it reflects
19 what the parties thought they were doing. Even if
20 Mr. Hefley was mistaken, it still reflects what he thought
21 or wanted to do and what he considered to be the situation
22 involving the parcel he was interested in.

23 Q. But you wouldn't have expected to see him be able
24 to have irrigation rights of the Gila River if you
25 couldn't get one, would you?

1 A. I don't know anything about what it took to get a
2 right in 1946.

3 CHAIRMAN EISENHOWER: Mr. Helm, are you
4 prepared to put your other two witnesses on right now?

5 MR. HELM: I can if you want.

6 CHAIRMAN EISENHOWER: I would like to do
7 that right now, please.

8 MR. HELM: Sure. I need to get their
9 thing, and we need to get hooked up.

10 CHAIRMAN EISENHOWER: I'd be happy to --

11 MR. HELM: I'm not done so I don't know what
12 we're going to do.

13 MR. MCGINNIS: Are you cutting him off?
14 Because we have some other people I don't think we have
15 any cross and some redirect, I think, on Littlefield.

16 CHAIRMAN EISENHOWER: Well, what want I to
17 do is get those two people on so that part is done. And
18 if we have to bring Mr. Helm back, we'll bring him back.
19 But you know, I think --

20 MR. HELM: It might help because I'll be
21 able to eliminate some questions here, quite frankly,
22 because like I said, I had to write these in the margins
23 because of the time frame and so I --

24 CHAIRMAN EISENHOWER: You think your two
25 witnesses will alleviate some of your questions?

1 MR. HELM: I don't know that alleviate -- it
2 might eliminate them.

3 CHAIRMAN EISENHOWER: Eliminate them, fine.

4 MR. MCGINNIS: I guess I don't see the logic
5 of stopping him now and then starting back later.

6 CHAIRMAN EISENHOWER: How long are you going
7 to go?

8 MR. MCGINNIS: You told him 20 minutes, 15
9 minutes.

10 CHAIRMAN EISENHOWER: Yeah, I know, that's
11 what I mean.

12 MR. HELM: How long am I going to go?
13 That's his report as you can see from going up here,
14 that's page 78, so I've gone through 78 pages of his
15 report. His report is 136 pages long, so more than
16 halfway through it, and I've done that in half an hour.

17 CHAIRMAN EISENHOWER: Let's expedite it,
18 please.

19 MR. HELM: I'm trying.

20 CHAIRMAN EISENHOWER: Please.

21 MR. HELM: We need to set up for a second,
22 hook up the computer and get that all --

23 CHAIRMAN EISENHOWER: No, go ahead and get
24 yours done so -- I want to finish -- we're going to finish
25 this up tonight.

1 MR. HELM: I can stay here as long as you
2 want.

3 CHAIRMAN EISENHOWER: Well, we're not going
4 to stay here as long as you want, I guarantee. Because we
5 want evidence for our purposes; you know, you have another
6 reason and I understand that reason. But we're trying to
7 bring evidence before this commission so that we can make
8 a qualified judgment. And I would like you to expedite
9 your questioning and -- so we can move on to your two
10 witness. And we have some -- a couple of other witnesses
11 behind that.

12 MR. HELM: I understand that, Mr. Chairman.
13 But the problem that I'm faced with is that what you do
14 here today -- what you do can effect the Gila River for
15 time immemorial. And we have to have a fair opportunity
16 to cross-examine. That's guaranteed by the Constitution
17 of the United States, it's part the due process clause.
18 I'm hurrying just as fast as I can. Like I say, when I
19 took his deposition, it took two, three days -- I don't
20 remember. It wasn't --

21 CHAIRMAN EISENHOWER: We're not taking a
22 deposition in court here.

23 MR. HELM: I understand that. But we're
24 taking testimony and if we just have the witnesses state
25 everything without a fair chance to test their statements,

1 then you're going to get --

2 CHAIRMAN EISENHOWER: You're getting that
3 chance.

4 MR. HELM: And that's all I'm saying. I'm
5 doing it just as fast as I can.

6 MR. MCGINNIS: I think Mr. Helm maybe just
7 made the point I was going to stand up and say, and that
8 is, he did have two and a half days or three days or
9 whatever in the deposition. The transcript is in the
10 record, it's already been admitted. I think he's covered
11 a lot of the ground in the transcript again, from what my
12 recollection of the reading the transcript. So he's got
13 two and a half days, plus the four hours we've spent part
14 of the time with Dr. Littlefield reading aloud from the
15 patent files. So we're getting close to limit here. This
16 is my opinion and it's our position.

17 MR. HESTAND: With the commission's
18 permission --

19 MR. HELM: Do you think this was in the
20 deposition, this report he filed the day before the
21 hearing?

22 MR. MCGINNIS: Well, John, one of your
23 witnesses hasn't filed a report at all yet. That's what
24 the rules provide for.

25 MR. HELM: That's no problem.

1 MR. HESTAND: John Hestand on behalf of Gila
2 River Indian community.

3 Due process, constitutional rights do not
4 guarantee somebody the right to ramble for as long as they
5 want. It is the standard in court that judges will tell
6 people they have 45 minutes. Major cases that we're
7 involved with, the adjudication of the general --
8 adjudication of the water rights of the State of Arizona,
9 they tell you have 45 minutes only to cross-exam this
10 witness. There is no guarantee of 14 hours. Thank you.

11 MS. HERR-CARDILLO: Mr. Chairman, if I could
12 just let you know, the witness that we have from out of
13 town has a flight back to Maryland that is leaving at 7:00
14 so he is not at liberty to stay past probably 5:30.

15 MR. HELM: It will be expedited quicker if I
16 let him do it because I can then eliminate a bunch of
17 these questions. I have just, in this little space, got
18 rid of two more pages just by being able to see. But it's
19 difficult to ask and read at the same time.

20 CHAIRMAN EISENHOWER: So if your two expert
21 witnesses will eliminate a lot of questions, why don't we
22 do that then?

23 MR. HELM: Well, I think that's a request
24 for the Center for Law in the Public Interest. It will
25 move me long because I can go read these and say, "I've

1 already covered this," and go on to the next page.

2 MR. MCGINNIS: Dr. Littlefield also has a
3 flight out this evening. He's been on the stand since 11
4 o'clock this morning. So I understand his problem.

5 If you want to give Mr. Helm some time while
6 the other person testifies and come back, a specific
7 eliminate of time, I don't have a problem with that. But
8 if we come back and go on all night, we're going object to
9 that.

10 MR. HELM: I'm not going to go on all night.

11 MR. MCGINNIS: You've already gone on all
12 day.

13 COMMISSIONER ECHEVERRIA: Let's let the guy
14 from Center for Law in the Public Interest speak.

15 MR. HELM: I think it will end up
16 expediting things.

17 CHAIRMAN EISENHOWER: All right.

18 EXECUTIVE DIRECTOR MEHNERT: Is this the
19 same case or is this the Verde case they're talking about?

20 CHAIRMAN EISENHOWER: He has a flight out
21 tonight, correct?

22 MR. MCGINNIS: Yes.

23 CHAIRMAN EISENHOWER: We're getting into
24 flights here, and I'm sorry. How long are you going to
25 take?

1 MR. HELM: I am not responsible for
2 questions I'm asked, but I, myself, will take 20 minutes
3 at the most.

4 MR. MCGINNIS: But he's going to talk about
5 the Verde, correct?

6 CHAIRMAN EISENHOWER: You're going to talk
7 about the Verde, correct?

8 MR. HELM: Yes.

9 CHAIRMAN EISENHOWER: We may not get to the
10 Verde, that's what I warned the other participants about
11 earlier today is that we wanted to finish the Gila today.
12 And if we have to reconvene the Verde in January, that's
13 what we will do. So I hope you understand that. But I --
14 what I want to do is get the Gila out of the way. And
15 believe me, this is nothing against you. I would love to
16 see you and hear your presentation, but we've got -- we're
17 in the midst of a river right now.

18 MR. HELM: I used to do arbitration. I
19 understand. It's all right.

20 CHAIRMAN EISENHOWER: Okay. If we can
21 expedite the two witnesses that Mr. Helm has, then fine,
22 let's go ahead and do that.

23 (An off-the-record discussion ensued.)

24 MR. HELM: John Helm for Maricopa County
25 again. Our first is Dr. D.C. Jackson. Dr. Jackson is a

1 professor of history at Lafayette College. He has a Ph.D.
2 from the University of Pennsylvania, a master's degree
3 from the University of Pennsylvania, and an engineering
4 degree from Swarthmore College. He's been a fellow with
5 the Hayden museum and library at the Dibner Institute for
6 the History of Science and Technology at the Massachusetts
7 Institute of Technology, the Philadelphia Center for Early
8 American Study at the University of Pennsylvania, and
9 predoctoral fellow at the National Museum of American
10 History for the Smithsonian Institution. So he's an
11 unusual -- a bear in one sense that he's got an
12 engineering background --

13 COMMISSION COUNSEL JENNINGS: Mr. Chairman,
14 let him testify as to his credentials. There's no reason
15 to have this advocacy on -- if we have any interest in
16 what his credentials are, we can ask him those questions.

17 MR. HELM: Could I note for the record that
18 -- Curtis, you have acted all day as an advocate instead
19 of as a representative of the commission, and to a certain
20 degree, some of us wonder how impartial you really are.
21 I'll let him do his own credentials.

22 COMMISSION COUNSEL JENNINGS: You have been
23 very rude, not only to me but to the commission and to all
24 of the other witnesses here, Mr. Helm, today.

25 DR. JACKSON: Thank you for the opportunity

1 to come and speak to you today.

2 CHAIRMAN EISENHOWER: No problem.

3 DR. JACKSON: We're just waiting to get this
4 set up. Could somebody just sit there and actually click
5 that, because I would like to -- I actually would like to
6 speak from over here so I can also see.

7 (An off-the-record discussion ensued.)

8 DR. JACKSON: While they're setting that up,
9 my background is I got a bachelor of science degree in
10 engineering from Swarthmore College in 1975. Actually
11 worked for the National Park Service for many years, then
12 I went back to graduate school, in history -- or the
13 degree is officially in American civilization.

14 I've been teaching at Lafayette College
15 since 1989. My specialty is the history of dams, the
16 history of water in the west, and the way that I came to
17 Arizona was actually through an interest in the dam
18 engineer who designed the Cave Creek Dam, and he was the
19 subject of my book, John S Eastwood -- or "Building the
20 Ultimately Dam: John S. Eastwood and the Control of Water
21 in the [American] West."

22 Recently I've done work on the St. Francis
23 Dam disaster with Norris Hundley, a very well-known
24 historian and Professor Emeritus at UCLA. And I have a
25 book coming out next year with Dave Billington, a

1 professor of engineering at Princeton University, on big
2 federal dams of the New Deal era.

3 But what I am here to talk to you about
4 today is -- see if we can get that first slide -- the
5 lower Gila River and navigability. If we can click on the
6 first slide.

7 We're dealing with issue of the equal
8 footing doctrine and the lower Gila River. And for my
9 purposes, I'm not here to talk about the middle reach
10 around Florence or the upper reaches in the Safford
11 Valley, this is from the confluence of the Gila and the
12 Salt River down to Yuma. That is what I'm here to talk
13 about.

14 And the question before us is, is the lower
15 Gila River navigable in the context of the equal footing
16 doctrine? And yes, I believe it is navigable. And the
17 question is -- what I would like this presentation to be
18 about is how have I come to this conclusion? Next.

19 Okay. The procedure I have followed is this
20 to determine navigability. First of all, the issue is
21 determine the standard of navigability to be applied to
22 the equal footing doctrine. I'm not interested in some
23 abstract notion of what navigability might be or might not
24 be. I'm interested in the standard of navigability to be
25 applied to equal footing doctrine. Now I want to review

1 historical data relative to navigability on the lower
2 Gila. For most of that -- or much of the work there was
3 done in the report from the Arizona State Land
4 Department -- I think this is one that Mr. Gilpin and
5 Mr. Fuller were involved with, that's a major source of
6 that -- review that historical data, add to it, consider,
7 and then assess how that historical data relates to the
8 appropriate standard of navigability and then make a
9 determination. Next.

10 Okay. What is the standard to be used?
11 Must battleships and aircraft carriers be able to navigate
12 year round? No.

13 Must large-scale commercial barges apply the
14 waters year round? No.

15 Must it meet the standards of navigability
16 applied to the -- by the U.S. Supreme Court in the Daniel
17 Ball decision? Yes.

18 Okay. Just a quick review. We've heard a
19 fair amount about this over the last two days. I think
20 this is the first time that I have actually gone up on the
21 slide what this might be. I realize the commission is
22 probably well aware of this definition, but I would like
23 to just reinforce it.

24 This comes from that 1870 ruling. Those
25 rivers must be regarded as public navigable rivers in law

1 which are navigable in fact. And they are navigable in
2 fact -- next -- when they are used or are susceptible of
3 being used in their ordinary condition as highways for
4 commerce over which trade and travel are or may be
5 conducted in the customary modes of trade and travel on
6 water. And I would say with this highlight, that
7 highlight is not in the original definition, I just
8 highlighted it here so that you could see it. I put that
9 in there.

10 The key here, though, is that when they are
11 used or are susceptible of being used in their ordinary
12 condition as highways for commerce -- not highways of
13 commerce, which oftentimes I see that phrase used --
14 highways for commerce over which trade and travel are
15 used. Next slide.

16 Okay. The Daniel Ball decision was not
17 originally issued in the context of the equal footing
18 doctrine. It came up in another context. I usually think
19 of it as the commerce clause context. However, it became
20 the standard and it was used in this very important case,
21 U.S. versus Holt Bank, which is an equal footing doctrine
22 case, relates to Mud Lake, which is in Minnesota, and the
23 issue of whether that was to be a state land under -- you
24 know, controlled by Minnesota under this doctrine. And in
25 this ruling, which is by the U.S. Supreme Court in 1926,

1 it states that navigability does not depend on the
2 particular mode in which such use is or may be had nor on
3 an absence of occasional difficulties in navigation.
4 Navigation does not need to be continuous either through a
5 stretch of river or over time. The Daniel Ball definition
6 is also expanded in this case to refer to natural and
7 ordinary condition. And I think you will see that this is
8 the case in which that phrase -- which I've heard a lot
9 about today -- comes into being in the specific context of
10 the equal footing doctrine. It also -- this case also
11 refers to a channel for useful commerce. Now the question
12 is what is useful commerce?

13 Okay. Final court case that I'm going to
14 use -- which I used all of these in making my
15 determination because this is how -- what is the standard?
16 How am I to define? That's what I'm opining about. So I
17 go to another U.S. Supreme Court case on the equal footing
18 doctrine. To my knowledge, this is the most recent case
19 that the Supreme Court has actually ruled on. This is
20 1971 and this clarifies the definition of useful commerce.
21 This case relates to navigation of the Great Salt Lake.
22 Is the Great Salt Lake -- near Salt Lake City -- is it
23 navigable or not? And in this case, what was ruled was
24 commerce does not need to be commercial in terms of
25 formalized public transportation between far-flung cities,

1 ports, or harbors.

2 In fact, what this case relates to or what
3 it hinges on is there are islands in the Great Salt Lake.
4 They are not large islands, they are not prominent, but
5 the Supreme Court -- and they are special masters --
6 discerned and ruled that there was ferrying of sheeps to
7 islands in the Great Salt Lake that took place as part of
8 local farming and agricultural operations, and they
9 determined that this was sufficient to demonstrate
10 navigability. And it was also seen that the furtherance
11 of local farming operations on the shores of the Great
12 Salt Lake was sufficient to meet the standard of useful
13 commerce. And I wanted to -- here is specific language
14 from the case.

15 Okay. Here specifically that the U.S.
16 Supreme Court stated that "The hauling was apparently done
17 by owners of the livestock, not by a carrier for the
18 purpose of making money." Hence, it is suggesting that
19 this was not the use of the lake as a navigable highway in
20 the customary sense of the word. That is to say the
21 business of the boats was ranching and not carrying
22 water-born freight. "We" -- this being the court --
23 "think that is an irrelevant detail."

24 The lake was used as a highway and that is
25 the gist of the federal test. And this is not commercial.

1 And furthermore, it is suggested that the carriage was
2 also limited in the sense of serving only the few people
3 who performed ranching operations along the shores of the
4 lake. But that, again, does not detract from the basic
5 finding that the lake served as a highway, and it is that
6 feature that distinguishes between navigability and
7 non-navigability.

8 This is the standard that I'm looking to in
9 now looking -- evaluating the lower Gila. And I would say
10 also, here, for the case here, that's specific to this
11 commission and Arizona, the Defenders of Wildlife versus
12 Hull, we have the Court of Appeals of Arizona case that
13 affirms that the Daniel Ball standard of navigability is
14 necessary for adjudicating the equal footing doctrine.
15 And this case also affirms that navigable in fact is
16 navigable in law.

17 Now, I'm just going to run through this
18 issue of the natural and ordinary condition of the lower
19 Gila. In this period, 1846, is when Anglo-Americans first
20 had a presence in the region through 1912, statehood.
21 Originally my colleague Win Hjalmarson who was going to be
22 speaking in a very significant way about these conditions
23 as flow, looking at it from a hydrologist's point of view.
24 So I'm not going to go into a lot -- he was originally
25 going to go first. So I'm not going to get into details

1 here, but I want to just give a snapshot over this and
2 maybe it will be a prelude to what he's going to talk
3 about.

4 During the latter 19th century, enormous
5 quantities of water were diverted from the Salt and Gila
6 Rivers, perhaps for irrigation. I think we all know --
7 this is something that I have been aware of, actually, in
8 research that I have done on Roosevelt Dam, on other dams
9 in the region, my knowledge of what was the Salt River
10 Valley Water Users Association, which then becomes SRP.

11 In the early 20th century, construction of
12 the Roosevelt Dam commenced on the upper Salt River. And
13 for my purposes, the Salt River is just as important as
14 the upper Gila in terms of the lower Gila. Once the
15 confluence is met -- I realize in the context of your
16 determination, you deal with Gila and you deal with
17 Salt -- but when it comes to the lower Gila, the Salt
18 River is just absolutely essential, and also the Verde.
19 They are a tributary to what I am addressing here. And
20 the construction of Roosevelt Dam starts in that period,
21 1905, 1906. It's officially not completed until March of
22 1911 when Teddy Roosevelt comes. However, water storage
23 starts by 1909. And in fact, this becomes evident because
24 the town of Roosevelt, which was in the reservoir take
25 area -- during construction, they had to move it because

1 waters were coming up. So storage begins to take place by
2 1909 on a very significant tributary.

3 And here we have Win in his report -- the
4 natural and ordinary flow of the river was tremendous, but
5 the actual flow was significantly diminished by
6 irrigation, diversion, and storage. And my opinion is
7 that any application of the Daniel Ball standard must
8 address the natural and ordinary flow.

9 Okay. Let's look at some of these ways in
10 which some evidence -- okay. You have the Kearney
11 expedition in 1946. It describes the lower Gila River as
12 about a hundred yards wide and flowing along a sandy
13 bottom. And that is taken from the -- that material from
14 the Arizona State Land Department report.

15 We also have the diversions of the Salt and
16 Gila commenced by the 1860s -- certainly swirling ditch
17 was underway by the late 1860s, enormous amount of water
18 taken out in the 1880s. The predecessor dam for the
19 Granite Reef was called the Arizona Dam, was completed in
20 the mid-1880s. And they only built Granite Reef because
21 it washes out in the floods of 1905. And as with these
22 diversions, however, as reported in a 1923 USGS water
23 supply paper -- this is one that Dr. Schumm referred to
24 this morning -- or it's in -- I don't think he referred to
25 it, but it's in his report -- a rancher in 1889 described

1 the river between Buckeye and the Gillespie Dam site as
2 having a well-defined channel with hard, sloping banks
3 lined with cottonwood and bushes.

4 Okay. I will leave to you -- to Win to
5 really fill in many, many of the -- much of the detail on
6 what the ordinary and natural condition would be. But
7 that's just to set it up. It was very different than what
8 it is today.

9 Okay. What I'm going to do is run through
10 evidence that provides of historical navigation of the
11 lower Gila River in this period. One of the first ones, a
12 very famous one, is the Cooke or the Mormon Battalion
13 journey that takes place very early January 1847 from the
14 Gila Bend vicinity to Yuma. Members of the battalion
15 fashioned a boat out of two wagons. We don't know exactly
16 the dimensions of these wagons, but these were not wagons
17 that were designed for river travel. This journey
18 suffered difficulties with low water -- I think that has
19 been well recorded -- but it reached Yuma in several days
20 and successfully navigated the lower Gila River. Cooke
21 himself, who was interested in getting to California to
22 fight in the Mexican War, did not consider it successful.
23 But for our purposes, it was successfully navigated. Even
24 though cargo had to be taken out, they got there.

25 Okay. In that same period, around 1849 --

1 this is journey that is documented in several books, it
2 has sort of varying details -- but this is the one that's
3 the Mrs. Howard slash Pancoast journey. This is the one
4 where supposedly the first Anglo-American child was born
5 in transit. Sometimes it's referred to as a boy,
6 sometimes a girl. I guess it's named "Gila" so I don't
7 know if you can really tell by the name.

8 What's important here, though, is that
9 Pancoast, who writes a book describing this even though he
10 did not actually go on the journey, he was aware of it and
11 it's recorded in there. This is the kind of evidence
12 that, in and of itself is not, I would say, absolutely
13 determinative. There are some books that were written
14 later. But it speaks to the kind of issue that this is
15 where we get evidence that people are certainly thinking
16 about navigation on the lower Gila. We have the Cooke
17 battalion where it's being done in the context of getting
18 to California in 1849. It fits into that structure.
19 Let's go to the next.

20 This is the first newspaper article I'm
21 going to make reference to. This is one that published in
22 the New York Tribune in February of 1850. It's a letter
23 anonymously sent from a place called "Camp Salvation" to
24 the New York Tribune, which by its date, February 1850, I
25 think it can be fair to assume that it refers to the year

1 before when the '49ers are going down the river. And it
2 indicates use of the Gila River by westward travelers.
3 And it was reported that travelers reaching the Colorado
4 River had made use of boats on the Gila River to lighten
5 loads pulled by wagon teams.

6 Now there is discussion -- I know that your
7 commission has heard -- or evidence on how to use
8 newspaper articles. I think we should always be careful
9 as historians to sort of evaluate and assess them. I find
10 this to be persuasive in the sense of providing evidence
11 that in the context of the fact that we know the Mormon
12 battalion had made use of the river -- and there is other
13 discussion of the Howard/Pancoast journey going down the
14 river -- that this seems plausible. This is going to be
15 part of the mosaic. This is going to be one of these that
16 we use to assemble a sense of, "Did navigation take
17 place?" Go to next one.

18 Okay. The next newspaper article to make
19 reference to here is one that appears in February of 1881.
20 This is a river trip by Cotton and Bingham that goes from
21 Phoenix to -- or announces that they're going from Phoenix
22 to Yuma, scheduled to leave the next day, and it indicates
23 that the journey is to be made in an 18-foot long skiff.
24 There are no subsequent reports on this impending trip, on
25 whether it occurred or not. But it certainly brings to

1 mind that travel was considered and that there was a boat.
2 It gives you information that this was something in the
3 realm of possibility and the newspaper reported that.

4 Next one we have, this is the famous Buckey
5 O'Neill. I guess this is the "Yuma or Bust" journey. And
6 this is reported in at least -- or two issues of the
7 Phoenix Gazette. And he makes a journey down the Gila
8 from Phoenix -- or from the Salt and then to the Gila in
9 November/December 1881. The reports indicate at the time
10 that the boat had to be pushed by men wading in water --
11 and I quote here -- "up to their knees," and the newspaper
12 indicated that the voyage, while scheduled to reach Yuma,
13 may have concluded in Gila Bend. There is some debate in
14 some of the accounts of whether they actually made it to
15 Yuma, but it seems quite certain they made it to Gila
16 Bend. And even though they might have had to push the
17 boat, water up to their knees indicates there's water up
18 to their knees and that's not an insignificant amount of
19 water.

20 I got ahead of myself. The O'Neill voyage
21 with crew members wading up to their knees may have
22 encountered difficulties in the journey to Gila Bend. But
23 as stipulated by the U.S. Supreme Court in U.S. versus
24 Holt Bank, navigability does not depend on the particular
25 mode in which such use is made or may be had nor on an

1 absence of occasional difficulties in navigation.

2 Okay. Next one that takes place. This is,
3 I think, a linchpin in story, one that gives me confidence
4 in terms of newspapers. It's report in two different
5 newspapers about a journey that Amos Adams and J.W. Evans
6 -- in one of the reports it's published G.W. -- they
7 journeyed down the full length of the Gila River to Yuma
8 in boat that's 3 and a half by 18 feet of the flat bottom
9 type. And it is described, actually, in three separate
10 newspaper articles. And actually this is the one I
11 really -- when I wrote the one that I developed with the
12 slide here, I realized I would like to read to you
13 specifically -- this is a letter that they sent --
14 actually, in the journey, they come down, they stop off in
15 Phoenix after making it to what to them was by far the
16 most arduous part of the journey, coming through the Box
17 Canyon from the Rialto reaches near -- I think it's
18 Evans -- maybe it Adams, Evans or Adams -- from Morenci.
19 He's taking a vacation. They get to Phoenix and that's
20 when they talk to the newspapers and then after they leave
21 and they get down to Gila Bend, they send a letter back,
22 and in fact, here I have almost the quote. The reach from
23 Phoenix to Gila Bend is described by Adams: "We found
24 nothing usual on our journey down the Salt and Gila Rivers
25 except that ducks were plentiful." And in fact, I want to

1 read, actually, the whole transcript, it's just one
2 paragraph, here it is. It's called "Venturesome Voyagers"
3 is the title here. Wait, no, that's not the report that
4 they were going to head off.

5 Okay. Here is the letter and it's dated
6 February 23rd, from Gila Bend. "Editor Herald in terms of
7 my promise to write, I wish to say that we found nothing
8 usual on our journey down the Salt and Gila Rivers except
9 that ducks were plentiful and that Evans ate so much of
10 them that he quacks now instead of talks." Little human
11 interest. "That, of course, is strange. In fact,
12 phenomenal, as we will all testify who know him.

13 "On entering or passing through the range of
14 mountains that the river cuts, called the Estrella or Gila
15 Bend, we got into a mineral zone, judging from the looks
16 of the country rocks, which is a granite formation, and
17 believe that in them there is a good field for a
18 prospector. We have arrived at the Wolfley Dam and" --
19 Now, the Wolfley Dam is the original dam that was built
20 that was to provide water for Gila Bend. This is the one
21 that washes out. In fact, we're going to come back to it
22 in a second here, but it washes out very soon after it's
23 built, it's completed in 1893, and it's always in
24 disrepair. And they are starting to set out to build what
25 is sometimes called the second Wolfley Dam, usually it's

1 oftentimes called the Peoria Dam, because the investors
2 were from Peoria, and there's actually a second dam that's
3 there, that -- it also washes out and then eventually
4 though that site is what is developed by the Gillespie Dam
5 starting in 1919.

6 Okay. So he says, "We have arrived at the
7 Wolfley Dam and find about 600 feet washed away and no
8 sign of anyone repairing it. But below, we saw that a
9 number of men and teams were at work on another dam, the
10 work being pushed by Toomey and George. We found plenty
11 of bees and a cave of honey. Oh, we are sweet. Flipjacks
12 and honey. We are at the Southern Pacific pumping station
13 four miles from Gila Bend. We're passing through a fine
14 country which has adapted to agricultural purposes and are
15 surprised at the evidence of thrift and enterprise to be
16 seen as we sail along of the ranchers that have settled
17 along the river. Yours, Amos Adams."

18 So they see ranchers, it's there, it's
19 evident. I think this is pretty clear. They made this
20 journey. I'm looking at this -- I read this, they made
21 this journey. They also, then, later when they make it to
22 Yuma, he gets back, he writes -- in this case it's -- I
23 think it's still Amos. Let me make sure. In another
24 letter it's either Adams or Evans. This is the one where
25 the reference is made, "Oh, I would never make that

1 journey again," but this is because of going through the
2 Box Canyon on the upper portion of the river. This has
3 nothing to do with the lower Gila River. There is nothing
4 in there to indicate that they didn't have a fine journey
5 from the confluence of the Salt and the Gila down to Yuma,
6 and they make reports on it. And I think this journey
7 took place. This journey indicates that the river is
8 susceptible for navigation, in fact, along its full length
9 in 1895. Okay, go to the next slide.

10 Okay. That's -- I have should have gone
11 through that.

12 Okay. Here's one final newspaper article.
13 Navigability of the lower Gila River is further
14 substantiated by a report of Jack Shibley, says he set out
15 on a voyage from Phoenix to Gila Bend. It's reported on
16 April 3rd, 1905, and his boat apparently capsized once,
17 but it made it to Gila Bend. That would be in the year of
18 the great floods.

19 Now what I want to do here is switch to a
20 different kind of evidence. We've looked at newspaper
21 articles. And I think, in reading some of the testimony
22 of some previous hearings, Dennis Gilpin has made a point
23 that sometimes the most effective and convincing evidence
24 is that which doesn't come from newspaper articles but
25 comes from a source that's not really specifically talking

1 about, let's say, navigation, but you learn about it. You
2 learn about it in some way. That's not the focus, but you
3 learn about it a very direct way of how it takes place.

4 What I would like to look at now, and this
5 is a case -- or it comes from a transcript from testimony
6 of a case before the General Land Office -- or at the
7 United States Land Office in Phoenix in March of 1911.
8 And this is the case here, the Enterprise Land and Water
9 and Gila River Water Company versus Frank Heresford and
10 James Bent Irrigation Company. And anyone who sort of
11 studies the history of the Gillespie Dam realizes after
12 those two dams fail, I'm sure the lawyers in this room
13 will be shocked to learn, an enormous of litigation
14 ensued. And this is one of the many cases that this --
15 that sort of come out of that. It's relatively light. Go
16 to the next slide.

17 Okay. In this, Streit testified -- now, I
18 must have been -- when I wrote this -- testified under
19 oath. I assumed it was under oath, but then I got here
20 today and I realized that hearings sometimes take place
21 not under oath. It certainly has taken place at a formal
22 hearing. There is a court reporter present. There is
23 taken directly from -- this information is taken directly
24 from the court reporter's transcript of what transpired.
25 So when I say under oath, I probably should have scratched

1 that out. So with that caveat.

2 And he states that he is county surveyor.
3 And I also realized, when I was looking at this yesterday,
4 he definitely testifies that he is the county surveyor.
5 He actually testifies this in 1911. I can't be absolutely
6 certain he was the county surveyor in 1893. However, his
7 testimony relates to his work as a surveyor in 1893. And
8 it was surveyed in locations -- and I use that quote that
9 he talks about -- "were made near the Wolfley Dam site,"
10 which is the future site of Gillespie Dam. And in this
11 we're going to see -- and I'm going to give you a verbatim
12 of how I transcribed it here -- detail, "Streitz describes
13 using 'Dougherty's skiff' to cross the river as part of
14 his work." Dougherty is indicated in other parts of this
15 transcript as a local rancher and farmer near where
16 Streitz and his men camped. Go to next slide.

17 Okay. So this is taken directly from that
18 testimony that he provides, and here we have the question:

19 "Were you there before the Gila Dam
20 was built.

21 "Answer, George Streitz: Oh, yes, we
22 made two surveys."

23 That should be question. "Two
24 surveys, whereabouts was the channel
25 of the Gila River, that is the water

1 channel, when you first saw it?"

2 And I think this also is significant. What
3 this is about is the effect of the construction of Wolfley
4 dam on the location of the channel that was used, which is
5 what these parties were interested -- they're not
6 interested in, per se, navigating, but they are interested
7 in where the channel is. Go to the next one.

8 Streitz goes, "On the extreme east
9 bank, almost opposite the Hualpai Butte.

10 "Question: How close was it to what
11 is now known as the headgates of the"
12 damsite of the Gila Water Company.

13 Word problem there, but I transposed them
14 some. But the headgates of the Gila Water Company dam.

15 "Answer:" By Streitz, "as near as I
16 can recollect, the location was below
17 where we landed, back and forth, with
18 our outfits to get across. I will explain
19 a little if you will permit me." Continue.

20 "Go ahead.

21 "Streitz: We passed back and forth to
22 get from our camp, which was on the west
23 side of the river near Dougherty's, and
24 walked down to the river and made turns
25 in getting across the river in Dougherty's,

1 and one man had to make the return, and
2 that's how I got these locations noted."

3 Next slide.

4 Okay. What's important here is -- okay,
5 this is not about navigation. This is about water rights,
6 water issues, where -- how this is going to be. But we
7 learned Streit uses the Gila River as a highway for
8 commerce in a simple and direct way. They use this and --
9 just as importantly, the testimony indicates that
10 Dougherty had a skiff as part of his farm, ranch
11 equipment. And this would be those same kind of people
12 that Amos and Evans saw when they took their journey down
13 the Gila River and they saw those farmers and those
14 ranchers get along. Okay. That's really important. This
15 is evidence; here we have that a rancher along the Gila
16 River has a skiff. And then a surveyor makes use of it.

17 Okay. Recall the Supreme Court ruling in
18 Utah versus U.S., quote: It is suggested that the
19 carriage was also limited on the Great Salt Lake in the
20 sense of serving only the few people who performed
21 ranching operations along the shores of the Great Salt
22 Lake. But that does not detract from the basic finding
23 that the lake served as a highway, and it is that feature
24 which distinguishes between navigability and
25 non-navigability. So what we have -- doesn't have to be

1 extensive use. Doesn't have to be -- but you use the
2 river as a highway for commerce.

3 Okay. Boating along the Gila River by
4 Dougherty was apparently a part of his activity as a farm
5 or ranch. This is directly analogous to the use of the
6 Great Salt Lake by local Utah farmers to ferry to the
7 island as a part of the business of being a sheep rancher.
8 Next.

9 Okay. Here's the conclusion. Evidence is
10 clear that the lower Gila River was susceptible for use as
11 a highway for commerce in period 1846 to 1912. We have
12 enough of that -- certainly the Amos evidence indicates
13 that. Natural and ordinary conditions of flow were
14 dramatically altered by river diversion and storage prior
15 to 1912. Nevertheless, navigation of the river and
16 portions thereof was undertaken by a range of travellers
17 in that period. Next.

18 The natural and ordinary conditions and use
19 along the lower Gila River provides clear evidence of the
20 Daniel Ball standard of navigability was met. And thus,
21 in my opinion, the lower Gila River is navigable in the
22 context of the equal footing doctrine and should be
23 recognized as such. And that concludes my testimony.

24 CHAIRMAN EISENHOWER: Any questions?

25 Is there anybody in the audience that has

1 any questions for Dr. Jackson?

2 (Dr. Jackson is answering questions.)

3 BY MR. MCGINNIS:

4 Q. Mark McGinnis on behalf of Salt River Project.

5 Dr. Jackson, couple quick questions. It's true, isn't it,
6 that you have not submitted a report to the commission on
7 this issue, have you?

8 A. I have provided the material to the lawyers. I
9 don't know whether it has been provided to the commission
10 or not. I provided this PowerPoint in last few days.

11 Q. Other than the PowerPoint presentation --

12 A. That is correct.

13 Q. -- you have not done anything else that's
14 submitted to the commission?

15 A. I did have a deposition in the Gillespie Dam case
16 which, I presume, might have been, I have no knowledge of
17 that. But, no -- other than that, no.

18 Q. And you're not a lawyer.

19 A. That is correct.

20 Q. Not admitted to the bar in Arizona?

21 A. No, sir.

22 MR. MCGINNIS: That's all the questions I
23 have.

24 (Dr. Jackson is answering questions.)

25

1 BY MR. SPARKS:

2 Q. Dr. Gillespie, I'm Joe Sparks on behalf of the
3 San Carlos Apache tribe, the Tonto Apache tribe -- the
4 Tonto Apache tribe, Yavapai Apache Nation -- Tucson.

5 By the way, that's Walpai not Halpai.

6 A. I apologize.

7 Q. And Gila is a Spanish word, and when it ends in
8 A, it's female.

9 In any event, do you have any information in
10 your testimony that would refer to a time period other
11 than the period from 1893 to 1895?

12 A. 1893 to 1895?

13 Q. Yes.

14 A. I have had there, I think, that we talk going
15 back to 1846.

16 Q. Was there anything up there that referred to
17 document other than -- or a report other than 1893 through
18 1895?

19 A. I believe there was.

20 Q. Which one was it?

21 A. Maybe I don't understand the question. Say that
22 again.

23 Q. Which document do you refer to in your PowerPoint
24 that is referring to the period other than 19- --

25 A. So you want to know about those ones talking

1 about --

2 Q. Let me just finish the question.

3 A. Certainly.

4 Q. -- 1893 through 1895?

5 A. Do I have anything other than that?

6 Q. Yes. On your PowerPoint, did you do anything
7 other than that?

8 A. No. I apologize, it has been 2 days. I'm just
9 not sure I understand what the question was. Just repeat
10 it one more time and I will be as clear as I possibly can
11 be.

12 Q. Do you refer in your testimony before the
13 commission specifically to any reports other than those
14 between 1893 and 1895?

15 A. I make reference in my -- the report to material
16 that is documented in the Gila River Navigability Study
17 for the Arizona State Land Department that makes
18 references to reports from the period 1846/47 through
19 1905.

20 Q. But other than referring to the report -- which
21 you didn't write?

22 A. That's correct.

23 Q. -- you don't refer to any reports for the
24 commission to look at?

25 A. Not that I'm aware of. I'm trying to understand

1 your question.

2 Q. The other question I want to ask you is what
3 period during the year did these reports refer to?

4 A. Which reports?

5 Q. Any of the reports that you referred to.

6 A. In the one -- I'm not exactly sure in terms of
7 the Streitzy testimony what part of that -- it's 1893, but
8 I don't know the specific time of the year.

9 Q. Well, were there any other periods except
10 November through April of a calendar year?

11 A. Not that I'm aware.

12 Q. Okay. Are you aware of the flows of Gila River
13 at that time?

14 A. Specifically -- I'm aware in a general sense
15 because I've read Win's report and I have read that -- I
16 do not have specific information now on that at this
17 point, but Win could provide evidence or --

18 Q. So the answer is no?

19 A. That would be correct.

20 Q. Okay. We could get through this faster if you
21 just say yes or no if it calls for that answer, okay?

22 A. I will try.

23 Q. Okay. That wasn't a yes?

24 A. No, it wasn't.

25 Q. Okay. Now, are you familiar with any reports

1 that refer to navigating the Gila River from May through
2 October of any year during which you testified?

3 A. Not specifically, no.

4 Q. Okay, thank you.

5 By the way, when Buckey was pushing the
6 boat, do you consider walking part of navigation?

7 A. Well, you know, most --

8 Q. Yes or no?

9 A. Yes. If they are pushing a boat. And boats,
10 oftentimes, need to be propelled and walking is one way
11 the propel a boat.

12 Q. You could propel a scooter the same way, right?

13 A. Presumably.

14 MR. SPARKS: Thank you.

15 CHAIRMAN EISENHOWER: Are there any other
16 questions for Dr. Jackson?

17 Hearing none, thank you, Dr. Jackson.

18 DR. JACKSON: Thank you.

19 MR. HELM: Our next witness is Hjalmar
20 Hjalmarson. He goes by the name of "Win" for the rest of
21 us and will answer to that to the commission. He's a
22 consulting hydrologist. He's a P.E. and a long-time
23 employee of the United States Geological Service. I'll
24 let him fill you in a little more on his qualifications.

25 CHAIRMAN EISENHOWER: Thank you.

1 (An off-the-record discussion ensued.)

2 MR. HJALMARSON: Okay. I'm Win Hjalmarson.
3 A true Arizona native. And a long list of -- Kenilworth
4 grammar school. As far as I can tell, I'm the only person
5 that I've listened to here that has actually measured the
6 Gila River. I measured it at Gillespie Dam, Painted Rock
7 dam, down at Dome. I think that I'm the only person that
8 has been stuck in Gila River back in the 1960s, and the
9 sand is very soft in places. And so I have been there and
10 done that in a way.

11 I'm a -- I have worked in Arizona with the
12 USGS from 1964 to 1993. And I was the service water
13 specialist for 12 years -- the last 12 years. So I do
14 have some experience with it. I'm also a registered
15 engineer in the state. So I'll be talking about the
16 navigability along the natural channel from the confluence
17 with the Salt to the mouth.

18 This supplements a report that I wrote in
19 2002. And on these slides in the lower right-hand corner
20 in blue, you will see a page number and that references
21 the talk to the report.

22 And I was hired to answer the question:
23 "Was the lower Gila River susceptible to navigation in its
24 natural and ordinary condition at statehood using the
25 federal standard?" And this is the standard. I think we

1 have gone over that plenty. The outline for this talk
2 is -- well, I'll present a couple of important terms, and
3 then I'm going to give some background hydrology to show
4 some photographs of water and how beautiful this state is,
5 and then I'll get into the report itself, which is the
6 hydrology, the hydraulics and morphology, and the
7 navigability. Important hydrology terms -- this is
8 standard stuff -- just, cubic foot is about seven and a
9 half gallons. What I really want to present here is,
10 "What is CFS?"

11 Okay. Here we have cubic foot moving down a
12 river, and in one second, it passes the arrow. So we have
13 1 cubic foot per second is a CFS. And this is what
14 50 cubic feet per second or CFS looks like. This is up in
15 Camp Verde. I took this photo a couple of years ago.
16 This is what 250 CFS looks like. This is at the Salt
17 River crossing above Roosevelt Dam. And a CFS is about
18 448.73 gallons per minute or GPM, and there's the acre
19 foot equivalent.

20 "Q is the rate of flow of water or the
21 discharge of a canal, stream, or river," so it -- Q is
22 discharge. Okay. And runoff is that part of
23 precipitation which naturally appears in surface streams,
24 and emphasis on naturally. It's the same as streamflow,
25 except it's unaffected by and anthropogenic case effects

1 or the works of man and so forth.

2 Here is an example, a little cartoon, that
3 shows direct runoff and base flow. And the direct runoff
4 is shown by the blue arrows on the surface here, so you
5 have precip or snow melt that comes off, goes down the
6 river, once it's in the river it's direct runoff, then you
7 have the water that infiltrates into the ground, slowly
8 makes its way to the river or stream, and that's the base
9 flow. That's very important in terms of navigability in
10 the lower Gila because during the dry periods, which
11 are -- can be rather long, you need water in the river to
12 navigate on.

13 Okay. There's two basic kinds of streams in
14 relation to groundwater. One is a gain stream where water
15 is coming out of the ground into the stream and
16 conversely, you have a losing stream where water leaves
17 the stream into the ground. Under natural conditions,
18 there was a lot of gaining going on, and recently, because
19 of the water use lowering water levels, we've got a lot of
20 losing streams.

21 Here is the watershed of the study area.
22 This is the Gila River watershed. It goes all over into
23 New Mexico. I haven't shown the part of it in Mexico, but
24 it's down here. The Santa Cruz and part of the San Pedro.
25 You have the Verde, the Salt, the upper Gila, the South

1 American Pedro, the Santa Cruz, the upper part.

2 Okay. And here's watershed. This is the
3 study reach, a 188-mile long reach of river from the
4 confluence of the Salt on down to the Colorado River.
5 It's very large. It's 43,500 square miles at the upper
6 end and 58,200 to the lower end and half the size of the
7 state of Arizona, and it includes a major watershed.

8 Okay. Geologically it's cut into old
9 terrace material, so generally it's in a degrading
10 condition.

11 This is the lower part, this is the area of
12 the rear that we're talking about, and it is basically the
13 drainage area down there. The precipitation in this area
14 is very low, it's three, four inches down in the Yuma area
15 and up -- Phoenix, it's about seven inches. The few
16 scattered mountains in here, it might be a little more.
17 You do get some mountain front recharge into the ground
18 that in the old days would make its way to the river. And
19 you do get some surface runoff in that area, not very
20 much.

21 Here's a USGS map, perennial flow stream map
22 for Arizona. It's produced by the Arizona Game and Fish
23 and the USGS back in 1978, and it shows the flow is
24 perennial prior to diversion and impoundment or decline of
25 groundwater levels in our study reach of the Gila River.

1 Roosevelt Dam site in 1905 on the Salt River.

2 This is where ASU is, right down there where
3 those fields are, in 1905, and the Salt River is just to
4 the left. So this is where all the diverted water was
5 going, into agricultural use. Okay.

6 This is a rock diversion dam. This is on
7 the ditch that I have a water use right, it goes back to
8 1867, that there were other diversions prior to that by
9 the military at Camp Verde. But anyway, there was many of
10 these types of diversions since about, roughly, 1860.
11 Here's a couple of more. And then here's the Gillespie
12 Dam. Okay.

13 Many thousands of stock tanks. I think
14 there's over 18,000 in the state that have applied for
15 permitting through AEWR, and there's probably, but anyway,
16 there were a lot of stock tanks that started back in the
17 old days. And also damming of springs and so forth for
18 other uses. Okay.

19 Here we have the area of large dams.
20 Roosevelt Dam just before statehood. I think it started
21 impounding water in roughly 1909 and got serious about it
22 in 1911.

23 Here is the three dams on the Salt plus
24 Coolidge Dam, the two on the Verde. Painted Rock and
25 Gillespie and the one up at Lake Pleasant there --

1 McMacon, is it? This just shows things are changing, very
2 deep wells, et cetera, et cetera.

3 Here is some recreation -- just a couple of
4 people in audience that can relate to that, I know. But
5 here is recreation on the Salt, the Gila, and the Verde,
6 all above the large dams. And a little commercial
7 operation in Camp Verde.

8 Here's a quick look at some of the USGS
9 gauging stations, and we'll be looking at dry-weather
10 flow, but of course, all the flow we're looking at here is
11 effected by diversions.

12 The upper Gila. Okay, let's just go through
13 them pretty fast. Middle Gila. Blue River. San Pedro.
14 Tonto. Salt, Roosevelt. Salt Prisapeal in the canyon
15 there -- Salt River Canyon. Verde, that's 23 CFS. Camp
16 Verde. And here we are down near the Tangle Creek gauge
17 right about Horseshoe. Okay.

18 Okay. We'll take a closer look at the
19 hydrology now.

20 We have a large number of alluvial basins.
21 They are significant in assessing navigation. Plus all
22 along the Mogollon Rim here, we have got a massive
23 sandstone aquifer that underlies basically all of the
24 little Colorado River basin and then it's exposed along
25 the rim and water from it recharges and goes down through

1 into the limestone below and a lot of it makes its way
2 into the Gila River watershed. And just to orient you
3 here, this thing goes all the way to Silver City, New
4 Mexico. It's a big watershed and it drains some beautiful
5 high country with a lot of snow.

6 And speaking of snow, here's the NRCS snow
7 sites up here along the rim and around Baldy and around
8 San Francisco Mountains. So this is where we get a large
9 snow pack and then a lot of spring runoff. Back in the
10 old days it would make its way right down through the Gila
11 and on into the Colorado. Okay.

12 Here's a little cartoon that kind of shows
13 what's going on along the Mogollon Rim. You got your
14 precip and then you got your huge Coconino aquifer, you
15 hear it called sea -- sandstone, red wall limestone --
16 excuse me, limestone, red wall limestone and so forth.
17 And water basically just seeps all the way down. It moves
18 rather slowly and so forth. Okay.

19 Let's just take a quick look at Fossil
20 Spring. This is 43 cubic feet per second. It has been
21 flowing that as long we know. Just about as steady as --
22 just 43 all the time. Okay.

23 Here is a quick look at Horton Creek. It
24 drains the Coconino sandstone. And Cibecue Creek, it
25 originates in the limestone.

1 Now let's take a look at these alluvial
2 basins. You know they would be Little Chino Valley, Big
3 Chino Valley, the Verde Valley, and so forth, Safford
4 Valley, all the different valleys. And as you come down
5 the major rivers, the Salt, the Verde and the Gila River,
6 the river passes through these alluvial basins surrounded
7 by mountains and so forth, and the groundwater also moves
8 from one to the other. So everything is interconnected.

9 And you can look at a little water budget
10 here for a representative basin where you have a recharge
11 and evapotranspiration, groundwater coming in, groundwater
12 coming out. Maybe perennial stream flow losses to the
13 aquifer or vice versa. And then your perennial flow out.
14 Okay. And in the early development, there were wells
15 developed along these streams. There were many
16 diversions, many dams. The result is the groundwater
17 level started to drop and gaining streams became losing
18 streams. So during spring runoff, these basins were
19 filled, and during dry periods, the water drained away
20 back into the river. It was kind of like a savings
21 account. You had plenty, you put it in the bank and when
22 you needed it, it would come out.

23 A couple of rather poor quality photos of
24 these alluvial basins, but just to show you, there's some
25 differences in them. Here's one up in the Gila, lava

1 farming. A couple more. Here you've got a little spring
2 runoff and water flowing out into some farm land. So the
3 Gila River was supplied by many springs in the upper
4 watershed, and many of them originated up in the Mogollon
5 Rim. Also -- next slide -- and many springs that
6 originated in the alluvial basins all over the place.

7 Okay. Now, this is important. Because of
8 this huge amount of groundwater stored in these basins and
9 then slowly released during summer period, the flow
10 probably did not change much along the study area because
11 of this massive supply of water. It was millions and
12 millions of acres of water in storage then. And before
13 the water levels were lowered, it drained out into the
14 river. Okay.

15 So in predevelopment, you had alluvial
16 basins or at least hydrogeologic areas that some -- people
17 them. Typically, we're hydraulically connected to
18 streams, predominantly through soils and also through
19 basin fill. And just to emphasis this a little bit, this
20 is just to show that a gaining stream where you have
21 groundwater coming into the stream -- okay, next slide --
22 and development such as wells in the valleys -- or this
23 could also represent a diversion dam or whatever, but
24 development changed everything and the stream -- water
25 from the streams went out into the ground. I'm kind of

1 describing the subflow issue here too. Go ahead.

2 So in predevelopment, we have a lot of
3 runoff going into the lower Gila River. Verde, 25 to
4 30 inches a year up in here, lots of snow pack and so
5 forth. Also, you have a large number of very steady
6 flowing springs up here, the one that drains Big Chino and
7 Mormon Pocket and Fossil Creek and the one down at the
8 start of the Salt right below where the Black and White
9 River come together. There is a huge spring in there
10 that's -- they are all very steady. Okay.

11 So now we get into the report. The
12 hydrology, hydraulics, and the navigability. And go
13 through in it steps because the subsequent steps are
14 dependent on, let's say, the hydrology. Okay. So my goal
15 is to estimate the amount and temporal distribution of the
16 natural flow in the Gila River for this study reach. And
17 to do this, I'm focusing on the main, the median, and the
18 base flow. And I'll show you how I use those later.

19 Okay. Two primary sources of information
20 for the hydrology are these two reports produced by the
21 USGS. This is predevelopment hydrology on the Gila River
22 Indian Reservation, so this is basically right above where
23 the confluence with the Salt. And then here's a like one
24 in the Salt River right near its mouth.

25 Let's go to next one.

1 So in these two publications is an
2 exhaustive analysis of more than a hundred years of stream
3 flow data at several sites, and basically, all the stream
4 flow data available that pertained to the estimate of the
5 natural runoff at these two points.

6 I also used triggering data and long-term
7 precipitation data and estimates of the effects of
8 development. As far as I'm concerned, this is best
9 technical data available for this analysis.

10 This is just an example of how you might
11 use -- or how precipitation data was used. You kind of
12 look at any climate -- or any trends and so forth and then
13 make adjustments if up. What they were doing was focusing
14 on the hundred-year period before 1870. Okay.

15 An example of dendrochronology, I did work
16 with the University of Arizona people so you have
17 tree-ring width here versus time. And they did some
18 comparison with it to make sure they were on the right
19 track and it wasn't some kind of climate trend of
20 something eating them up.

21 Now the base flow came from the report by
22 Freethey and Anderson, and this is what defined the water
23 budgets for all the alluvial basins in the basin and range
24 physiographic problems. So you take those water budgets
25 and add them all up and you come up with a base flow down

1 through the study reach. That's my worn and tattered copy
2 of it -- or the cover for it. Okay.

3 So there they are, the three reports that
4 were the basis for the hydrology of what I did. Okay.
5 And that's the hundred-year period before 1870 is what
6 they said it applied to, and I'll let you read that.

7 So basically what they determined was that
8 the Indians along the Salt had been there for a long time.
9 The Indians along the Gila weren't using a significant
10 amount of water to -- the amount wasn't significant for
11 their analysis. And I guess there was some uncertainty
12 with it, and so they assumed that the Indians were not
13 using any water. So these produced a long-term mean,
14 median, and base flow.

15 The evaluations took into account a heavily
16 vegetated area -- or heavily vegetated riparian areas in
17 both of the reservations, but in particular, the Gila
18 reservation. And they extracted, from this estimate,
19 250,000 acre foot per year that was lost to ET. Okay.
20 And here are the estimates. At the confluence of the
21 Salt, the mean 2,330; the median, 17,500; and the base,
22 290. This is before development.

23 And down at the mouth, I kept the mean and
24 the median the same because the losses to ET seemed to be
25 balanced by the inflow from that rather arid area, but

1 there was definitely a loss in the base flow. Instead of
2 290 down to 170. Okay.

3 So here is the estimates of the mean and the
4 median, and then for my own edification, I did three quick
5 checks using USGS hydrologic unit maps on these first two
6 methods down here in the bottom in green. And USGS has
7 published runoff for hydrologic units for the entire
8 country, so that was real easy information to get ahold of
9 and I used it. What you have to do is make estimates of
10 transmission losses as the flow crosses these different
11 alluvial valleys.

12 And I used two different methods to estimate
13 that, so that's why I have two different numbers there.
14 The last check is Corps of Engineers report 1952, I think,
15 on the lower Colorado River. And they had a number of
16 1,800. And I'm not sure if that's a clean number in
17 regard to predevelopment, there might be some losses to
18 development in there. I'm not sure. But anyway, there is
19 the number. In any event, there's pretty good general
20 agreement. Okay.

21 Now, a good way to explain this data in
22 terms of the issue -- and that is navigation, could it
23 have occurred -- is the flow duration curve. Did -- "a
24 cumulative frequency curve that shows the percent of time
25 specified discharges were equaled or exceeded during a

1 given period." And let's look at a big view of it. Next.

2 And there's a flow duration curve and this
3 is -- you can think of this as reconstructed flow. This
4 is what it was back in the old days. And here is where
5 the median point plots 50 percent of the time. We have
6 the 1700. Base flows down here. There's two base flow
7 points, the upper and lower reach. And then you draw a
8 line here that corresponds to the mean. And you fit the
9 curve through this information -- let's go to next slide,
10 and I will show you how -- you hold the curve on this
11 point and the two points down here for the basins. And
12 then the area of this curve here has to equal the area
13 here. So you just graphically fit it through -- or I use
14 a computer and knocked it out -- but in reality these
15 curves are smooth. This has little break points in it,
16 but just kind of think of it as a nice smooth curve.

17 So this shows that the river was perennial,
18 and it shows the distribution of flow throughout the year.
19 90 percent of the time it was at least this base flow
20 amount of either 179 near the mouth or 290. Up here, it's
21 at least 1700 and whatever at the median, and the mean
22 here plotted roughly at 37 percent, so 30 percent of
23 the -- 7 percent of the time the flow was at least 25, 30.
24 And that just shows -- I already showed that -- this
25 technique has been used by engineers -- I guess you would

1 say only old engineers might use it now, but I'm one of
2 them, and it's very good technique for doing something
3 like this.

4 Okay. Now we have the hydrology defined.
5 Next step is to define the natural hydrologic and
6 morphologic characteristics. In other words, let's take a
7 look at the shape of that channel, the size of it and the
8 shape of it, and the velocity. It's a deformable alluvial
9 channel, like the Mississippi and like many, many other
10 channels in the United States and in the world. So the
11 size and the shape formed by the sediments and the flow of
12 the river.

13 Here are the two primary publications I used
14 for this. The first one is by Osterkamp.
15 Sediment-Morphology Relations for alluvial channels. In
16 particular, cornel flow alluvial channels, i.e., base
17 level streams mostly, not piedmont streams.

18 I used that method to determine the width
19 and then the second method, by Burkham, I used to
20 determine the depth and the velocity. And here's a couple
21 of tattered pages of those publications, but I have them
22 here if anybody wants to see them.

23 I also used standard methods -- standard
24 hydrology methods. This is an old hydraulic geometry
25 publication by the USGS. Let's go to next one. Here's a

1 Corps or Engineers publication that uses it. Here is a
2 example of where it's used in the Mississippi River basin.
3 Here is a study in Australia. So it's a well-proven
4 method and it's used all over the world.

5 There is just a sketch of what -- I want to
6 make sure that everybody understands what we're looking
7 at, a base flow level here, a median flow level here, and
8 a mean annual flow level up here. Okay.

9 And here is the sketch of the width; the
10 maximum depth, which is little D ; the mean depth, D ; and
11 the areas with times mean depth.

12 Okay. Now this is a hydraulic geometry
13 relation, that's what it's known as. It's also known as a
14 power function. But this is what these relations looked
15 like. And this is -- width is equal to mean annual flow Q
16 which is -- you can think of it as a discharge -- with
17 this coefficient A and exponent B which are related to the
18 sediment characteristics of the channel. So all of this
19 is a mathematical relationship that's been derived
20 empirically but it has a strong hydraulic geomorphic basis
21 to it.

22 And I went out and collected sediment
23 samples all along the river. Kicked dirt. Okay. Did
24 many particle size distributions. This is the particle
25 size in millimeters versus the cumulative percent of the

1 particles finer than the indicated size, so this is kind
2 of like a flow duration curve, but it's a little
3 different, same idea.

4 Also used all the available soil survey
5 reports which covered the entire reach. And in those are
6 particle size analyses of the sediments and the
7 description of the sediments along the river. Okay.

8 Here's a couple of examples of the power
9 function just to show the difference you get when you have
10 a sand bed with silt banks. This is the relation for the
11 Gila River. And if you had just a gravel channel, then
12 this is the relation. Okay.

13 From the range of sediment I found in the
14 Gila, I came up with five different relations for the bed
15 material shown there, all way from median silt clay on up
16 to gravel. And I computed a width for each one of those
17 and took the average and came out 300 feet, all using
18 methods by -- the method by -- as defined by Osterkamp.
19 Okay.

20 So Manning's equation was next used by a
21 parabolic twist that matches the hydraulic geometry
22 technique was incorporated by Burkham, which I followed,
23 and from that, I computed the shape of the channel and the
24 depth and velocity.

25 And there's what this channel looks like.

1 It's actually much wider than indicated here. You got to
2 pay special attention to scale, zero, 100, 200, 300 feet,
3 and the depth incriminates here are 1 foot. So it's a
4 pretty wide channel. I'm talking about the main channel.
5 Now, beyond -- up above here 5 or 6 foot, it will start to
6 spread, that's where your floodplains will start,
7 somewhere up there. I don't care about that for this
8 analysis.

9 CHAIRMAN EISENHOWER: Reconvene.

10 MR. HJALMARSON: The mean annual flow of
11 2,330. We have -- the width is 300, that's an average
12 like I showed you. Mean depth 3.1, and mean velocity of
13 2.5. The estimated maximum depth is 4.8. The -- and here
14 is a width duration curve for these computations, and it
15 just shows the percent of the time that the width on the
16 upper part or the lower part was greater than the amount
17 indicated over here, like the width of 300, it's -- come
18 down here and it's 30 something percent. And for a width
19 200, you could come over and down, and roughly 80 percent
20 of time, it was at least 200 and so forth. Okay. And for
21 the median, it's about 270 feet, so 50 percent of the time
22 it was greater than that.

23 And here's the velocity duration for the
24 same type of thing. Really you don't have to look at this
25 in detail. What it really shows is that the velocity is

1 quite mild and amateurs can put boats on that river most
2 of the time. Okay. And here is the depth velocity
3 relation at a velocity, say, of 2 for the upper, the depth
4 would be a little over 2 feet, and so forth. So it just
5 gives you a feel for what was out there. Okay.

6 Now back to the flow duration curve. This
7 shows the base flow here, it shows the width on the upper
8 part of the reach, the mean depth, and the velocity, and
9 the median, the same thing. And at the mean. So it just
10 gives you an idea of what's there and showing the
11 discharge too. Okay.

12 The same relation now showing the maximum
13 depth. Now, the maximum depth represents the depth of the
14 center of the channel and quite a large part of it. Okay.

15 Now, this is kind of geomorphology -- you
16 might call it geomorphology hocus pocus or whatever if you
17 are not familiar with this method, so this is a check of
18 what I did. Okay. Let's to go next one.

19 Now, using the land surveys that we've heard
20 so much today, I went in and examined the surveys, and I
21 found 122 surveyed widths for the period 1867 to 1992, and
22 of course, all of this is in the study reach. This is a
23 listing of those widths, and I have arranged them in
24 increasing order. So the smallest one I found was 104 and
25 it goes on up to almost a half mile wide.

1 Keep in mind that these surveys were made
2 during times when diversions were taking place and the
3 stock tanks were being built and so forth and so on.
4 Water was being extracted over the entire watershed.
5 Okay. But there was no major dams.

6 Now here's a plot of those widths. This is
7 a width duration curve for the surveyed widths, percent of
8 time versus the channel width in feet. Okay. Let's go to
9 the next one. And here is a sample. This is the Gila
10 River near Gila Bend, nice, narrow, kind of gently
11 meandering river with some straight stretches in here.
12 Here's a survey depth. This is in 1871 -- excuse me, this
13 is a survey ditch. And there is the road to old Fort
14 Yuma. So the surveyors surveyed these widths along the
15 section lines. They didn't record the angles very well,
16 the angle of incidence of the river at the section line,
17 but they did it, north, south, east, west, all along the
18 river.

19 So the widths I just showed you, the 132
20 widths, represent this width relative to the channel
21 crossing a section line. The width I computed using the
22 hydraulic geometry, was this width which is perpendicular
23 to the floor. And what we don't know is this angle theta,
24 but we do know this relationship is a trigometric function
25 of the surveyed width, is equal to the width times the

1 cosecant theta. Okay. So just to rehash here, this is
2 the power function that was used to determine this width.

3 Now, the power function relation is this red
4 dashed line, the surveyed ones are this. Now, how do we
5 relate this? We don't know theta, but we have a relation
6 to work with. Okay.

7 That's just a summary of what I've said.
8 Okay.

9 So the channel was meandering. It was going
10 in a generally western direction but also south. And it
11 looked like the angle theta could be anything from zero to
12 almost 90 degrees. So therefore, an equal likelihood of
13 the angle theta was assumed. This is how you express this
14 mathematically in a probability function. And the
15 integral that I used for this analysis was one degree. So
16 B would be one degree more than A over the range from zero
17 to 90 degrees. Okay. And this is just a mathematical
18 representation of that. So we have this computed
19 relation, now let's see if we can make it equivalent to
20 the surveyed widths.

21 Here is the computed relation. I broke it
22 into 10 equal increments of percent of time excluding the
23 upper end here because this is the area where overbank
24 flow could be occurring. And mathematically, this is
25 expressed here. Here's the width and we have 10 points.

1 N equals 1 to 10. And we're going to assume the angle
2 could be anything from zero to 90 in one-degree
3 increments, so we're going to have 90 pages for each one
4 of these 10 points or a total of 900 estimates of the
5 surveyed widths. Okay. And here is the result, this
6 pink-dashed line versus the surveyed widths. These are
7 done completely independent, and that's an excellent check
8 of the hydrology -- hydraulic geometry methodology.

9 When you consider that the hydraulic
10 geometry produces a long-term average and the surveyed
11 widths are a relatively short period of time and when
12 water was being extracted from the river, this is
13 especially good agreement. Okay.

14 So in this hydraulic geometry method, I have
15 basically made the assumption that the Gila River was a
16 single meandering channel, let's see if it was. This just
17 demonstrates the problem -- and I think Dr. Schumm covered
18 this a little bit today, but let's -- there's a balance
19 here. You've got sediment size versus sediment load
20 versus water discharge versus slope of channel, and all
21 those have to stay in balance, and if something changes,
22 then the scale moves and the dial goes either towards
23 aggradation or degradation. So the thing is in a state of
24 imbalance when you change something. Okay.

25 I'll let you read that. So the morphology

1 is self-formed. There's few hard rock controls, and the
2 channel is formed of material that was basically
3 transported by the river itself and deposited by the river
4 and its tributaries. So I'm going to use four relations
5 that show associations of the different variables that
6 people have developed and that are generally used by
7 morphologists and engineers doing this kind of stuff.

8 The first one is the Leopold-Wolman
9 Association developed back in '57. Let's just go directly
10 to the relation. It shows a relation between bankfull
11 discharge or mean annual flow and channel slope. The mean
12 annual flow from the Gila is right here, 2,330, and the
13 range of slope is shown here, so this little line here
14 represents the Gila River. On the lower part the line,
15 this line here, rivers are meandering, and above that line
16 they're braided, so it's meandering.

17 Okay. Here is the Parker Association, a
18 little more recent. Let's go right to the relation. This
19 is the width-depth ratio shown here -- actually, it's the
20 inverse of it, it's the depth-width ratio, really. And
21 then the slope divided by the foot number -- the foot
22 number is a measure of the velocity and the state of the
23 flow. The Gila plots right in this area and you use this
24 curve like this, you come down parallel to these
25 relations, so you have a point here, you come down, and

1 you run into meandering. Okay.

2 Third method, the Bledsoe and Watson
3 Association. And let's go right to it. This one shows
4 sediment -- the median sediment diameter. The Gila was in
5 this range here. And then the slope times the square root
6 of the discharge, the mean annual discharge and that plots
7 in this range here, and this circle basically encompasses
8 the entire lower Gila and it's in the meandering zone as
9 opposed to say braiding, which of course it is now.

10 Okay. And here is the Schumm-Khan
11 Association. Let's go right to it. This is a very simple
12 relation, but it shows -- what you do is you get the slope
13 of your river, and the slope is within this range about 5
14 to 6 feet per mile in the upper part and about 3 foot per
15 mile in the lower part near Yuma, maybe down right near
16 the Colorado closer to 2, so right in this range here, you
17 have the Gila and you just simply go up to this relation
18 right here and see what you got. It's right on the lower
19 end of the meandering. It's definitely not up here in the
20 braided. And it also suggests that the sinuosity was low.
21 Okay.

22 So this is just a generality about the
23 pattern is a function of the stream power, the gradient,
24 and sediment load. And like I say, it suggests the low
25 sinuosity so there's not a whole lot of meandering here.

1 A real high sinuosity would indicate the thing was going
2 around like that. It's really going -- really meandering
3 around. There's not much to it. And as far as I'm
4 concerned, that's what it's got, that's what we have down
5 there. I've examined the plots of the river and most of
6 them look very similar to this, got straight stretches
7 with just slight meanders.

8 Now, another thing that was in the federal
9 surveys was notations of a lot of cottonwood and brush and
10 mesquite along the banks of the river. And of course,
11 this -- you have to have a stable river to get vegetation
12 established. And then once it's established, it in turn
13 stabilizes it. And then once it's stabilized, then you
14 get processes like donoring, the fine sediments go into
15 the banks and the thing becomes more and more stable. And
16 then once in a while a big flood comes along and tears it
17 all out and Mother Nature starts all over again.

18 By the way, we had several notations this
19 morning of very large willow and cottonwood, 10 inch right
20 at the water's edge, 6 inch and 8 inch, I remember this
21 morning. Okay.

22 Let's see, wait a minute.

23 Can you go back? Well, the significance of
24 that -- significance in regard to navigability is the
25 channel was meandering, and such a channel is relatively

1 stable as opposed to say braided, so it's easier to
2 navigate on. And the method I used is super power
3 function and the use. Okay.

4 So let's look at navigability under natural
5 conditions. Now we're using the hydrology and we're using
6 the hydraulics and morphology that I have shown. Was the
7 Gila River navigable? Okay. I used three independent
8 federal methods. The first is a Bureau of Outdoor
9 Recreation. There is a very simple method that basically
10 says that if you have a minimum depth of 1 foot and a
11 minimum depth of 6 foot, for recreational craft you can
12 use it. We have a minimum depth of about a foot and a
13 half during the low base flow and on up well above 1 foot,
14 and the width is generally more than 150 feet. So easily,
15 easily pass that test. Okay.

16 Here's the second test. And this is Bureau
17 of Outdoor Recreation. And here's the gradient in feet
18 per mile versus discharge. This is where the base flow
19 plots the median and mean. They all are in class 1, which
20 means even old guys like me might be able to navigate it
21 easily -- and it's easy. And it shows, as you increase
22 discharge, of course, it can become more and more
23 difficult and at high flows it could become treacherous,
24 but not much of the time.

25 Third method is more of an engineering

1 application produced by the USGS by one the best
2 geomorphologist engineers that I am aware of, Walter
3 Langbein, "Hydraulics of River Channels as Related to
4 Navigability." Okay.

5 And I'm just going to show you, this is a
6 full-blown engineering analysis where forced diagrams were
7 used, and this is a vessel going upstream. And of course,
8 for this assessment of navigability, all we need to do is
9 have the vessel go downstream. This method takes one
10 unnecessary step, but interesting. Let's take a look at
11 what it does. It uses the hydraulic geometry attributes,
12 although I've already computed those, so I was drawn to
13 it. And this shows the relation between hydraulic
14 geometry of a vessel versus a river, and these
15 characteristics are combined. Okay.

16 If tractive force of a moving vessel is
17 used, $T(s)$ -- this is thrust divided by weight -- and this
18 really becomes a dimensional number. It's kind of a
19 unit thrust thing where this is the thrust that just
20 starts the vessel to move, so it's at an equilibrium
21 point. So it doesn't matter what kind of vessel we're
22 talking about.

23 This is just another equation showing
24 tractive force. Tractive force is a function of the drag,
25 draft, squat, size, weight, and speed of the vessel and

1 the slope, velocity, depth, and specific weight of the
2 water in the river. Okay.

3 Here's a table from that report, and I am
4 showing the Gila River where it fell. You've got the
5 Mississippi River evaluated up here. Right above the Gila
6 is the Red River and below is the Missouri, Green,
7 Yellowstone, and so forth, and it falls right in here with
8 this tractive force.

9 And here is a plot of it, this is velocity
10 in feet per second. You will probably see some
11 similarities in velocity in what I have already shown you.
12 This is where it plots here with channel depth over here.
13 And here it is with the Mississippi way up here, and it
14 shows -- this clearly shows that it's navigable, upstream
15 and downstream. Okay.

16 So studies based on published information,
17 standard engineering methods, systematic three-step
18 method. They are going through the hydrology, the
19 hydraulics, morphology, which is basically the shape,
20 roughness, slope of the channel, and we looked at the
21 navigability.

22 Okay. For all alluvial channels like the
23 natural Gila River, the Mississippi, you name it, big
24 floods can suddenly disrupt the channel. Over time, the
25 channel will gradually recover or heal as smaller flows

1 reworks the mobile bed and so forth. Now if you take away
2 the flow, like what happened to the Gila, it's not going
3 to heal. So in 1891 you have a big flood, all the flow is
4 diverted, and river just sits there all torn up. It's not
5 going to heal itself. When you start putting dams in, it
6 gets worse and worse. So it's completely different than
7 it was. Okay.

8 So the evidence suggests this following
9 natural channel, it's a low gradient, as Dr. Schumm showed
10 this morning, higher gradient ones can be braided. This
11 is quite low. "Well-defined alluvial channel slightly
12 entrenched in well-defined floodplains covered with brush
13 and trees. Valleys are broad with high terraces.
14 Slightly meandering channel with some riffles and pools."

15 In terms of modern boats, or old ones there
16 too, canoes, drift boat, rowboat up there, almost all the
17 time you could put one on. Depending on your skill, you
18 make the call, but you could take it up here if the higher
19 flow.

20 Power boats on there at about 70 percent of
21 the time, that's where the depth could be greater than
22 3 feet. Okay. This is how the base flow might look in
23 the cross section and there's a raft and some boats,
24 canoe, and so forth. 12, 14 foot, easy. Okay. And then
25 power boats for median flow, catamaran, that kind of

1 stuff. Okay.

2 This is just a review of what I showed
3 earlier. This shows width, depth, and velocity for
4 distribution of flow for the various flows.

5 My opinion, "the Gila River, from the
6 confluence with the Salt ... to the mouth at the Colorado
7 River was susceptible to navigation at the time of
8 statehood ... in its ordinary and natural condition using
9 the federal standard."

10 That's it.

11 CHAIRMAN EISENHOWER: Any questions?

12 COMMISSIONER HENNESS: No.

13 COMMISSIONER ECHEVERRIA: No.

14 CHAIRMAN EISENHOWER: Mr. Hjalmarson?

15 MR. HJALMARSON: Yes.

16 CHAIRMAN EISENHOWER: We have some questions
17 for you.

18 MR. HJALMARSON: Okay.

19 (Mr. Hjalmarson is answering questions.)

20 BY COMMISSION COUNSEL JENNINGS:

21 Q. Mr. Hjalmarson, I understand you consider, for
22 purposes of your report, the ordinary and natural
23 condition to be without any diversions and without any
24 groundwater pumping?

25 A. That's true.

1 Q. In other words, a completely virgin country that
2 man has never set foot on?

3 A. Yes.

4 Q. Well, then, I'm curious, why do you limit your
5 period of time to pre-1970? Why don't you go back to 2000
6 years ago or, say, 300 AD?

7 A. Very good question, however, I'm locked into the
8 hydrology methodology that I chose to use, and that's what
9 they state in their reports. However, you can take a
10 small leap of faith and say, "All right, that's the way it
11 is."

12 But here is the caveat to that, is they
13 looked at climate trends and so forth and said. "All
14 right, we're safe in projecting back that far." Now, it's
15 possible that we had a different climate not too long ago.
16 And so with that in mind, you know I'm looking at a virgin
17 situation, like you say, but we have got to be realistic.
18 We know the climate is changing and so it varies from time
19 to time.

20 Q. How much effect on the flow does groundwater
21 pumping at the present rate we're pumping have on your
22 figures? Or can you give an estimate? That's a tough one
23 to answer with precision.

24 A. Well, one way to answer that is the more that is
25 withdrawn and the more lowering of groundwater levels you

1 have the harder it would be to bring the river back to
2 where it was. If you did away with all the dams and
3 everything and tried to put it back in place like was
4 talked about earlier today, then it would become more
5 difficult. But the bulk of the change has already
6 occurred and additional pumping isn't going to change it
7 much more.

8 Q. But the pumping that has already occurred over
9 the last, let's say, hundred years has made a significant
10 difference in it?

11 A. Yes. Basically what it did is it changed the
12 streams from gaining to losing, using the cartoons and so
13 forth that I have shown. That's basically what's
14 happened.

15 COMMISSION COUNSEL JENNINGS: Thank you.

16 CHAIRMAN EISENHOWER: Is there anybody else
17 in the audience that would like to question
18 Mr. Hjalmarson?

19 MR. MCGINNIS: Yes.

20 (Mr. Hjalmarson is answering questions.)

21 BY MR. MCGINNIS:

22 Q. I'm Mark McGinnis on behalf of Salt River
23 Project. I guess to start off with -- and I apologize if
24 I butcher your name. I'll probably say it about 10
25 different ways.

1 A. Call me Gus.

2 Q. Gus? How about doctor, that will work?

3 To start off with, Doctor, I would like you

4 to tell me --

5 A. I'm not a doctor.

6 Q. You're not. I thought you were. Okay.

7 A. I'm a P.E.

8 Q. You're a P.E.

9 Okay. Gus -- it's getting late -- can you
10 tell me what actual data from pre-1912 you used in doing
11 your analysis?

12 A. Pre-1912, what I relied on, on the hydrology, is
13 the analysis done by my USGS colleagues on those three
14 reports. They used all the stream flow data available.
15 Some of it -- I think Verde Bartlett goes back to the late
16 1800s, and there's two other stations that go back what
17 were -- where you have well over a hundred-year period of
18 record and goes well before statehood. And I think Gila
19 Dome goes back before statehood and a few others.

20 Q. When you say "Gila Dome," what are you referring
21 to? I mean, I know where Gila Dome is, but what data?

22 A. USGS gauge there called Gila River near Dome.

23 Q. So other than flow data, is there any actual data
24 that you used in your analysis that was from prior to --
25 1912 or earlier?

1 A. Yes. I didn't cover it in my talk, it's in my
2 report. One example is the use of the U.S. Geological
3 Survey topo maps and a few of those go back to 1903 and
4 '04 and I did examine those.

5 Q. Anything before 1900 in terms of those maps?

6 A. Not that I can remember.

7 Q. Is there any other data before 1912, other than
8 what we have talked about, that went into your analysis,
9 in your work here, actual data -- field data? Not that
10 you collected, but the data -- I'm not suggesting that you
11 went back before 1900 and collected data. Could be
12 secondary sources.

13 A. No. Nothing comes to mind. I'm not -- I looked
14 at a lot of publications, but I can't recall.

15 Q. It's true, isn't it, that your work in this
16 matter has been to deal with susceptibility of navigation,
17 and you haven't spent any time determining whether things
18 were actually navigated or not. Is that right?

19 A. That's right. I approached it from a hydrology
20 engineering standpoint, and as I discussed here, it was
21 based on the hydrology and the morphology and the
22 hydraulics, all of which I'm well-versed in. I did the
23 assessment independent of historic accounts.

24 Q. In the slide show presentation or PowerPoint
25 presentation you showed this evening, you had two slides

1 that were back-to-back. One was, what does 50 CFS look
2 like? The other one was, what does 250 CFS look like? Do
3 you remember that?

4 A. Yes.

5 Q. Okay. One of those, I think, was on the Verde
6 and the other one was on the Salt?

7 A. Right.

8 Q. It's true, isn't it, that 50 CFS, for example,
9 would look different depending on the -- on a different
10 river?

11 A. Exactly. And they would definitely look a little
12 different on the lower Gila. The lower Gila was a
13 smoother channel, less gradient, so it would have a more
14 tranquil-looking water surface, and so forth. But my
15 reason for showing those was -- is to give the audience a
16 feel for "What does 50 CFS look like?" A lot of people
17 have no idea. So that was the purpose of it, as to kind
18 of -- let's get all of us -- all of us get on the same
19 page here, so roughly speaking.

20 Q. So 50 CFS in a channel that was 10 feet wide
21 would be pretty deep, wouldn't it?

22 A. Yeah. Well, or moving awful fast.

23 Q. 50 CFS in a channel that was mile wide would be
24 substantially less deep, wouldn't it?

25 A. Yes.

1 Q. One of the slides you showed in your presentation
2 dealt with the base flow and things that, I think, looked
3 like pans or something, if you remember. It says,
4 "Because of the large amount of stored groundwater that
5 supplied the base flow, the base flow may not have varied
6 greatly from one year to the next." Do you recall that?

7 A. Yes.

8 Q. It's true that you don't know how the base flow
9 varied, it's your assumption or your opinion that it may
10 not have varied?

11 A. There is a basis for that. Unfortunately,
12 there's not too many alluvial basins left in Arizona that
13 haven't been pumped dry or diverted significantly and so
14 forth. There are a couple you can look at to -- or let's
15 say portions of the basins that have been gauged with
16 streamform gauges, but one of them you can look at rather
17 cleanly is the Big Chino Valley. And to give you a feel
18 for how stable that flow is, or how steady it is, I can
19 give you a guess right now, it's about 23 plus or minus 2
20 CFS. And I can do that during dry weather year in and
21 year out since we've been gauging it since 1960.

22 Q. But you don't have any data for before 1964 or
23 certainly before 1912, even for the Big Chino flow, do
24 you?

25 A. No. But what I'm telling you how a basin like

1 that behaves where you have a large amount of storage that
2 hasn't been withdrawn. You get the same thing from Wet
3 Beaver Creek in the Verde Valley, where there hasn't been
4 much water use in its watershed and so forth, and you get
5 a very similar-looking flow duration curve. The flow
6 duration curve comes down and then just flattens off. And
7 it's interesting, even during the drought years, basins
8 like that, it stays -- it stays steady. Well, it drops a
9 small amount, but it doesn't go dry. It doesn't even come
10 close.

11 Fossil Creek is another one. It's flowing
12 43 CFS now. As far as we know, it was flowing 43 CFS a
13 thousand years ago. I don't know. But it sure hasn't
14 changed since we've looked at it.

15 Q. But you really don't know what it looked like a
16 thousand years ago?

17 A. No. But I know what it was a hundred years ago,
18 just about what it is now.

19 Q. You didn't do any work in this case to determine
20 the amount of water diverted by the Hohokam Indians, for
21 example, or the Pima Indians back in the time before the
22 arrival of the white man, did you?

23 A. No. Basically what I did was read the two
24 reports that I showed you, the pink and the gray one. And
25 in there, they discuss on one the Salt River reservation,

1 and the other one, the Gila River Indian Reservation. And
2 I gave you a summary of what they concluded, and I went
3 with that. I did some research on it. I took a look at
4 it and -- let's put it this way, if somebody could give me
5 when irrigation occurred and how extensive it was, whether
6 they had all the woodland riparian vegetation there, like
7 the studies assumed that I used either, et cetera, et
8 cetera, then with that kind of information, I might be
9 able to give some kind of estimate. But I couldn't find
10 anything reliable and my colleagues, when they produced
11 those reports, they said they couldn't either.

12 Q. So if you learned that the Hohokam, for example,
13 or the Pima Indians later on had irrigated 5,000 acres
14 before 1900, would that change your opinion that shows up
15 in this report?

16 A. 5,000 acres? I would have to know some more
17 detail. 5,000 acres, probably not.

18 Q. What about 10,000 acres?

19 A. Everything has a limit. Once you start
20 increasing the magnitude of the possibility like where
21 you're headed, then I have to have more -- I would have to
22 have more information, just like I explained. One of the
23 keys on this is, the USGS, when they did this, assumed a
24 very large riparian area, from which 200 and 15,000-acre
25 foot of water a year was lost to vapor. And that's

1 equivalent to a lot of farm land. So if you had Indians
2 out there gathering wood and all that, and removing that
3 riparian area and farming, then there is a tradeoff that's
4 occurring. And you have to -- so you have to know what
5 they were doing in order to assess that.

6 Q. You talk some in your presentation today about
7 mean flow, median flow, and base flow.

8 A. Yes.

9 Q. I was just wondering if you could explain to me
10 the difference between mean and median flows, for purposes
11 of making sure we're clear on the record what it is?

12 A. Well, the mean is the average annual flow. The
13 median is that which 50 percent of the time the flow is
14 greater than that and 50 percent of the time it's less
15 than that.

16 Q. You would agree with me that a river that has
17 periodic large floods, that the mean can be skewed upward
18 because of those occasional floods?

19 A. Well, what happens is like I showed on the flow
20 duration curve, yes, the curve goes up and it steepens as
21 the discharge increases, yes.

22 Q. Now, it's true, isn't it, that your analysis that
23 you did for this report assumes a smooth parabolic channel
24 for the Gila River?

25 A. That's the representative channel that falls out

1 in the computation, yes.

2 Q. You would agree with me, wouldn't you, that the
3 entire flow of -- the entire stretch of the Gila River is
4 not a smooth parabolic channel?

5 A. Sure. Absolutely.

6 Q. You agree with me it's not or you say it is?

7 A. It's not. But I would say that that smooth
8 parabolic does represent the steady state conditions down
9 the entire reach.

10 Q. But for purposes of somebody who is going to
11 float a boat down the river, the difference between a
12 smooth parabolic channel and a channel that maybe had
13 sandbars and snags and different formations might make a
14 difference, wouldn't it?

15 A. Definitely.

16 Q. And for purposes of this report, I think you said
17 that you assumed that the natural Gila River was a single
18 meandering channel. Is that right?

19 A. Yes. In the -- here is how this works. When you
20 apply the hydraulic geometry method, that, in effect, is
21 what you're assuming. And then when you go through it,
22 then you check to see if that assumption is correct. And
23 I used the four independent methods of showing that, and
24 they all showed that "By golly, that's the kind of channel
25 that that river wanted to be under its natural

1 conditions." That's what that means.

2 Q. But you would agree, wouldn't you, that at least
3 at certain times, the Gila River -- and certain portions
4 of the river there's at least some amount of braiding in
5 the river, wouldn't you?

6 A. There could easily be braiding and that's a
7 typical occurrence of nearly all alluvial channels,
8 including the Mississippi.

9 Q. And the braiding would be -- could be at least an
10 impediment to floating a boat?

11 A. It's possible that it would make navigability a
12 little more difficult. Yes, it's possible.

13 Q. Because it spreads the flow out at different
14 channels. Is that right? Or can?

15 A. It goes into different channels, i.e., the
16 braiding. It is possible for it to be easier, because it
17 might be rather than deep and narrow. So, you know, it
18 depends. When you're thinking navigability, you've got --
19 at least the way I think about it -- I separate it from
20 navigation.

21 Navigability is just a susceptibility to it.
22 So when you start getting specific, you know, like, is
23 grading more difficult, well, you have to -- at that
24 point, you start thinking of watercraft and all that, now
25 you're, to me, into navigation.

1 Q. Okay. That's was the next question I wanted to
2 ask you. Do you have a copy of your report with you?

3 A. I was looking to what happened to my notebook. I
4 have a blue notebook someplace.

5 Q. Not the power, the actual report part of it.

6 A. Yes.

7 (An off-the-record discussion ensued.)

8 BY MR. MCGINNIS:

9 Q. Specifically I think what we were just talking
10 about shows up on page 6 of your report. This is your --
11 the one that's dated October 25th, 2002. Page 6, last
12 bullet point. Is that the point that you were just
13 making?

14 A. Yes. The mathematical assessment is that, yes.

15 Q. It says -- well, I guess the one I'm looking at
16 says, "Navigability was independent of undesirable
17 conditions ..." Are we talking about the same paragraph?

18 A. Yes.

19 Q. Okay. Could you explain to me once again how --
20 what the difference you believe is between navigability
21 and navigation or susceptibility to navigation?

22 A. Well, for example, the third navigability test I
23 showed you, the USGS method, that's really independent of
24 watercraft. It just shows how this river performs in
25 regard to the force required to move a vessel, and it can

1 be any vessel. It's kind of a unit thrust presentation.

2 So from that standpoint, it doesn't matter.

3 Q. You would agree with me, though, in the final
4 analysis, when you come down to determining whether
5 something is navigable or not, it really does come down to
6 whether -- at least depends upon whether a subject to
7 navigation can be navigated?

8 A. Well, I've shown you the watercraft that would
9 navigate -- could navigate on it. I've showed you small
10 watercraft most of the time and power boats, 70 -- 60, 70
11 percent of the time, whatever. Depending on your skill at
12 the high flow end.

13 Q. I'm not trying to be difficult. I'm just trying
14 to figure out whether you have an opinion that I haven't
15 figured out yet about -- something about navigability, it
16 doesn't have to do with a boat.

17 A. Okay. Go ahead.

18 Q. Does navigability have to do with floating a
19 boat?

20 A. A barge, some kind of floating vessel, yeah. The
21 watercraft.

22 Q. On page 8 of your report, under section 1.1,
23 looking specifically at the first paragraph under section
24 1.1, third sentence, you say, "There are other factors of
25 an economic and commercial nature that may be less

1 obvious." And I think that relates to navigability, but
2 you can read the whole thing. My question is, what are
3 the other factors of an economic and commercial nature
4 that relate to navigability that may be less obvious?

5 A. Well, I didn't include those, but it has to do
6 with running a business, of transporting beaver hides, or
7 whatever, and the nature of that type of endeavor. And
8 I'm not looking at that at all.

9 Q. Okay. So your testimony today is that there are
10 factors in addition to those you've looked at that affect
11 whether something is navigable or not?

12 A. No. No. I'm saying that it's susceptible to
13 navigation.

14 Q. Just -- I'm not trying to quarrel with you, but
15 that sentence -- the first sentence of that paragraph
16 says, "The ability to navigate on a river encompasses many
17 factors such as the amount of flow in the river channel,
18 the width and depth of flow in the channel, the type of
19 vessel and the purpose of the [vessel]."

20 A. Yes.

21 Q. Then the second sentence after that says there
22 are other factors other than the minimum depth of water,
23 which is the sentence I skipped.

24 A. Well -- and it's non-hydraulic factors that I
25 didn't consider.

1 Q. Okay.

2 A. That gets into the economics and all kind of
3 stuff.

4 Q. So there are factors in the navigability analysis
5 that are non-hydraulic that you didn't consider in this
6 report?

7 A. Yes.

8 Q. Okay. I'm skipping because that was -- in fact,
9 it's late, I'm flipping through here.

10 COMMISSIONER ECHEVERRIA: Is it?

11 MR. MCGINNIS: You didn't notice? I think
12 we've all become a little numb here at this point.

13 BY MR. MCGINNIS:

14 Q. It's true that your -- the flow data that you
15 used, the flow information that you used for the Salt
16 River reservation and the Gila River reservation, you took
17 those two, which were from different rivers, and added
18 them together to get a sum, right?

19 A. Yes.

20 Q. And you didn't consider evapotranspiration below
21 those two points, did you?

22 A. Yes.

23 Q. How did you consider that?

24 A. Well, I described in the talk. I looked at the
25 runoff from the inner reading area, which was rather

1 small, and -- but it appeared to approximately offset
2 losses to ET along the river for the median and average
3 flow, so I made the assumption that just keep it the same.

4 Q. So you assumed that the two of them cancelled
5 each other out?

6 A. Right. On base flow, it was definitely a loss.

7 Q. You would agree with me, wouldn't you, Doctor,
8 that there are certain portions of the year or portions of
9 particular time of year where even you would agree that it
10 would be difficult to navigate the Gila River under your
11 ordinary and natural conditions?

12 A. Part of that would depend on skill and what the
13 function of the navigation was, but generally speaking,
14 yeah, during very high flows, that would be difficult for
15 almost any skill -- any skilled person.

16 Q. It would also be true during very low flows,
17 wouldn't it?

18 A. No. Not -- my analysis indicated that you could
19 put a small boat on that just about all the time.

20 Q. On page 16 of your report, third paragraph
21 down -- I'll let you look at it. Feel free to read the
22 whole paragraph. I want to talk about the third sentence
23 that says, "In terms of using a vessel on the Gila River,
24 the lower flows such as the base runoff, may limit
25 navigability for at least part of a typical year."

1 A. Yes, for -- depending on boat, it could do it.
2 On the size of the boat and so forth.

3 Q. You talked some about the Bureau of Outdoor
4 Recreation method of determining navigability in your
5 presentation earlier?

6 A. Which page?

7 Q. In your report, page 24.

8 A. Okay.

9 Q. I think on page 24 and 25 you talk about that.
10 It's my understanding that you classify the Gila River as
11 a Class I, very easy?

12 A. We're up to the mean -- yes, up to the mean
13 discharge as shown on figure 4.1.

14 Q. And there can be obstacles like sandbars and
15 riffles even in a Class I, isn't there?

16 A. Sure.

17 Q. You talk some about going in the upstream
18 direction instead of -- in addition to the downstream
19 direction in the presentation.

20 A. That was kind of just for fun. I'm just doing
21 that for a point of interest. You don't need that for
22 this assessment. But I thought I would share that.

23 Q. You've been here for the last -- what seems like
24 a week, but it has only been two days of hearings, right?

25 A. Right.

1 Q. And you haven't heard anybody have any testimony
2 in the last two days about anybody ever actually going
3 upstream traveling, have you? On the Gila?

4 A. Well, no, I haven't heard one way or the other,
5 really.

6 Q. Just making sure I hadn't missed anything in
7 terms of what was going on.

8 A. They had some motorboats, you know, around the
9 turn of the century, as far as I know. But you have to
10 paddle a canoe up on the side. I've done some paddling on
11 the Colorado River, and you have to hang in close to the
12 banks to do it, all that kind of stuff.

13 Q. So I have couple of questions about the Langbein
14 method of determining navigability, which is on page 27 in
15 your report, just to make sure I understand the numbers,
16 because sometimes I have a hard time with that. I think
17 you say that the Gila River below the Salt River to the
18 mouth has a coefficient or whatever you call it of .001?

19 A. Yes.

20 Q. And also on the same page, right before that
21 table, you say, "Within the range from .002 to .001,
22 navigation is usually limited to ferry or shortrun
23 operations"?

24 A. Yes.

25 Q. And the Gila River is in that range, right?

1 A. Yes. And keep in mind, though, that this
2 assessment in navigability in the USGS report, this is a
3 pretty large craft, and in terms of downstream navigation,
4 it shows that it would be a piece of cake.

5 Q. I'm going to show you a different document.

6 Have you seen this document before, Doctor?

7 A. I guess I wrote it, yeah.

8 Q. Could you please tell us what it is?

9 A. Let's see.

10 Well, these are what I call my notes when I
11 was putting together my assessment.

12 Q. The notes that you did on your own in preparing
13 this report, the report for this case?

14 A. Yeah. It's kind of like -- yeah, roughing it out
15 and -- yes.

16 Q. On the second page -- first page says
17 "Confidential Notes" at the top, right?

18 A. Yes.

19 Q. Those notes aren't confidential at this point,
20 are they?

21 A. Not anymore.

22 Q. At some point they were, but not for a couple of
23 years now, right?

24 A. Right. And that's just the way of identifying
25 that, "Hey, this is personal stuff, and it's part of the

1 reporting procedure."

2 Q. Okay. On the second page of this document, is
3 that your handwriting there on the lower right? Second
4 page.

5 A. Number two?

6 Q. No, just the second page.

7 A. Yes.

8 Q. And the date is July 2001, is that about when you
9 did this?

10 A. I guess so.

11 Q. That's before, I assume, the October 2002 report
12 that was a done?

13 A. Yes. Well, yeah. Before it became final, yes.

14 Q. There's substantial differences between this
15 draft -- this document and the report, wouldn't you say?

16 A. Yes. Definitely.

17 Q. For example, in the very first sentence of this
18 document you say, "My limited research on the history of
19 navigability of the Gila River suggests it was not used on
20 a regular basis for any kind of water transportation of
21 bulk commodities such as furs or covered wagons or
22 people."

23 A. Yeah, but I'm not a historian.

24 Q. And this sentence didn't end up in your report,
25 did it?

1 A. No, it certainly didn't because I'm not qualified
2 to really do that. This is just rough reporting for me to
3 document what I observed at the time. Simple as that.

4 Q. Okay. I understand.

5 A. I do remember learning about Buckey O'Neill when
6 I was in grammar school, and I thought it would have been
7 fun to have gone down there with Buckey.

8 Q. There's a very nice statue of him in Courthouse
9 Square in Prescott.

10 A. I know.

11 CHAIRMAN EISENHOWER: It's really not.

12 MR. MCGINNIS: It's not him?

13 CHAIRMAN EISENHOWER: The statue is the
14 Arizona Rangers that went on the first cavalry to the
15 Spanish-American war. And everybody proclaimed it to be
16 Buckey, but it really wasn't. It was just symbolic of the
17 Rangers.

18 MR. MCGINNIS: I'm glad I stayed tonight
19 because I've learned something new.

20 CHAIRMAN EISENHOWER: A little levity at
21 this hour of the night.

22 BY MR. MCGINNIS:

23 Q. I want to look at what I think is page 35 of this
24 document.

25 A. They are handwritten down at the bottom?

1 Q. Yeah.

2 A. Okay.

3 Q. Okay. Under Topography.

4 A. Yes.

5 Q. Can you explain to me what -- you can take your
6 time to read it -- explain to me what this is talking
7 about?

8 A. I took USGS maps and from them -- this is seven
9 and a half minute topo -- from them, I just cut
10 cross-sections on them and did some very crude
11 computations of width, depth, and velocity. Considering
12 the scale of the maps and so forth, it's, you know, like
13 hydrologists -- I can -- if you show me 160 acres of
14 alfalfa, I can just real quickly tell you how much water
15 it would use in a year, whether it's here or in the Verde
16 Valley or up in Utah or whatever. So this is kind of that
17 type of thing. Kind of zeroing in on what's there.

18 Q. The third sentence of that topography paragraph
19 says, "Two of the sites were selected because there were
20 braided channels that represented a worst-case condition
21 for navigability."

22 A. That's right. Downstream of Gillespie Dam about
23 5 miles there is a reach there that was shown braided on
24 the topographic map, but keep in mind, the map was
25 produced after all these diversions and everything and

1 after the big floods.

2 Q. The very next sentence, though, you wrote -- as
3 of July 2001 you wrote, "It is unknown if the braided
4 conditions were representative of natural conditions."

5 A. That's right. I didn't know at that time.
6 That's right.

7 Q. And just to save some time, the next couple of
8 paragraphs also talk braiding, don't they? If you want to
9 go through them, we can. I'm not trying to trick you or
10 anything.

11 A. Let's see, that's on 36?

12 Q. Look at the bottom of 35, next to the last
13 paragraph, second sentence says, "Following very large
14 floods the channel may have become destabilized and
15 reaches may have developed multiple channels of braids."

16 A. That can happen after large floods, yes. And
17 then it heals and tries to go back to what it wants to be.

18 Q. Next paragraph, first sentence says, "There may
19 have been channel braiding in places along the Gila River
20 as suggested by the oldest available USGS topographic
21 maps."

22 A. That's true.

23 Q. Next sentence, "There was also at least one
24 historic account of multiple channels." Is that right?
25 Next sentence after the one I just read.

1 A. Yes.

2 Q. At the time this document was produced, or at
3 least completed in the form it is, had anybody reviewed it
4 other than you?

5 A. No.

6 Q. I'm assuming your report has been reviewed --
7 your final report has been reviewed by people other than
8 you. Is that right? I'm not asking names. I'm just
9 wondering if anybody else has read it before it is
10 finalized.

11 A. Yeah, there's somebody that read it, but it
12 didn't go through a real rigorous review that I can
13 recall. Yes, it was read by a couple of people.

14 Q. And I think that you said in your presentation
15 earlier that you used Manning's equation as part of this
16 analysis?

17 A. Yes. The hydraulic geometry method is quite
18 precise for the estimation of width, but it's not as good
19 for depth and velocity. And I felt that by taking the
20 width and then the known parabolic shape of the channel
21 that's tied to the methodology, I decided to use Burkham's
22 method, which I felt was more accurate. It would have
23 been a lot easier to do it the other way.

24 Q. Manning's equation has several assumptions and
25 simplifications, I think you say in this document, right?

1 Again, I'm not trying to trick you.

2 Page 44, very top. You talk about the assumptions and
3 simplifications of Manning's equation.

4 A. Page 40?

5 Q. 44.

6 A. 44. These are standard assumptions. And I'm
7 looking at it with a rather refined point of view. I have
8 published books on how to estimate Manning and so forth.
9 And so I'm, yeah, I am making notes that remind myself of
10 the limitations.

11 Q. And there are limitations in not only Manning's
12 equation but also in the general methodology you used,
13 aren't there?

14 A. Sure.

15 Q. On page 45 of this document, you said -- it would
16 be under the heading there -- "Obviously, a large number
17 of historic measurements of channel characteristics,
18 especially channel width and depth for dry-weather flows,
19 would be important information for assessment of
20 navigability." Do you see that?

21 A. Yes.

22 Q. And you didn't have that -- those historic
23 measurements, did you?

24 A. I didn't have anything that, you know, that was
25 furnished to me or whatever. And I did make the decision

1 basically not to use it. Now, I did incorporate some
2 historic observations that are produced in the final --
3 that are shown in the final report. But that's really not
4 very critical information in regard to what I did.

5 (An off-the-record discussion ensued.)

6 BY MR. MCGINNIS:

7 Q. The last couple of questions I have on this
8 document, page 66, the Results.

9 A. Okay.

10 Q. You agree with me, Doctor, wouldn't you, that the
11 substantial portion of the information on this results
12 page doesn't appear in the final report, does it? You're
13 welcome to compare pair, if you want.

14 A. Yeah, definitely some of it doesn't appear in
15 there, yes.

16 Q. For example, the second paragraph talks about
17 "Navigability of the Gila River below Gillespie Damsite
18 was limited by areas with multiple (braided) channels
19 because flow was divided among two or more channels."

20 A. Right.

21 Q. And I don't think that's in report, is it?

22 A. No. And all that happens there is -- I don't
23 mean you can't apply it, but it means that to use that
24 type of channel shape would be much less precise if it
25 was, say, a braided condition; then you have to look at it

1 from a braided standpoint.

2 Q. The next sentence says, "Computations showed the
3 flow depths of the split flow was less than 1 foot in all
4 of the split channels about one month in a typical year."

5 A. It did appear that way in that one spot. But
6 like I say, that was -- that was in 19- -- Well, it was
7 well after the 1891 flood and the 1905 flood, I believe.

8 Q. And as far as you know, that sentence doesn't
9 appear in your report, does it?

10 A. No, because it's a clearly natural condition, so.

11 Q. The next sentence says, "Low flow navigation
12 would be unlikely in these areas of split flow about one
13 month or perhaps 5 or 6 weeks of a typical year."

14 A. Yes. Given the water -- given the unnatural
15 channel, yes.

16 Q. That doesn't appear in your report either?

17 A. No. Because that's the unnatural channel.

18 Q. So was this report -- or this document prepared
19 to deal with the unnatural channel? This document we're
20 talking about that says "Confidential Notes," which you're
21 calling the unnatural channel?

22 A. No. I'm staying with the natural, but I was
23 using the oldest available information, putting it in one
24 document, and then taking -- sitting back and taking an
25 assessment of it and realizing, "Hey, this isn't -- we've

1 had major floods and so forth, and what I'm looking at
2 here isn't even close to natural."

3 Q. Next sentence says, "Navigability during high
4 flows, as with all natural rivers, was also limited,"
5 right? Is that right?

6 A. Yeah. That's true with every river.

7 Q. And that's not in your final report either, is
8 it?

9 A. I have shown a range, I believe, there. But that
10 almost goes without saying, doesn't it? You're going to
11 get a major flood on the Mississippi or the Gila.

12 Q. I don't know if this says major flood. It says
13 "navigability during high flows." I don't mean to quibble
14 with you, but you know what you meant.

15 A. It's big time flow, yeah.

16 Q. Next sentence says, "The analysis, using the rule
17 of thumb technique, suggests navigability would be
18 difficult during about 2 weeks of high flow." Is that
19 right?

20 A. That was, yes, that's kind of what it looked
21 like, then I realized that that's -- was a lot of judgment
22 in that related to skill of the person in the craft and
23 the type of craft and that kind of stuff, so I took it
24 out. That's more of a navigation thing as opposed to
25 navigability.

1 Q. Next paragraph -- and I'm trying to begin --
2 short-circuit this so we can finish some time before
3 sunup -- next paragraph basically says that the channel
4 changes resulting from flooding also affects navigability?

5 A. Yes.

6 Q. That's right.

7 A. Yes.

8 Q. So your conclusion, the bottom of the result
9 section of this document, is as with most periods --
10 excuse me, "As with most rivers, navigability would have
11 been restricted during both high and very low flow
12 periods." Is that right?

13 A. Yeah, it would be more difficult, yes.

14 Q. And I'm assuming because you say "would have
15 been," you're not talking about July of 2001, you're
16 talking about some previous time. Is that right?

17 A. Yes.

18 Q. You testified -- or at least were retained by
19 Mr. Helm's firm or his client in the Gillespie Dam case.
20 Is that right?

21 A. Yes.

22 Q. And you were deposed in that case in January of
23 2003. Is that right?

24 A. Okay.

25 Q. Well, you have the document in front of you?

1 A. Yes.

2 Q. It says "January 16, 2003"?

3 A. Okay.

4 Q. And this, as far as you know -- you have seen a
5 copy of this transcript before. Is that right?

6 A. Yes.

7 Q. You don't have any reason to think anything in
8 here is not what you actually said, do you?

9 A. I'm not aware of it.

10 Q. Okay. Rather than reading back questions and
11 answers to you and spending our time, I think I'm going to
12 just submit this as a document as an exhibit to the
13 commission.

14 MR. MCGINNIS: And that will conclude my
15 questioning.

16 COMMISSIONER ECHEVERRIA: Does anyone else
17 have any questions?

18 John?

19 (Mr. Hjalmarson is answering questions.)

20 BY MR. HESTAND:

21 Q. May it please the commission, I am exceedingly
22 aware of the fact that every question I ask keeps me from
23 getting home to my wife and child. And in light of
24 self-interest says I will attempt to move things along.

25 Just as a preliminary thing, sir, am I

1 correct that you have presented no evidence on and
2 rendered no opinion about the navigability of the Gila
3 River upstream from the confluence of the Salt River?

4 A. That's true.

5 Q. Does your report list all sources of data or
6 information that you used in preparing that report, your
7 testimony -- your testimony today and the conclusions that
8 you drew?

9 A. To the best of my knowledge.

10 Q. Okay. Does your report list all specific data
11 that you used in the computations of the various formula
12 and making all of the conclusion that you drew either in
13 the report or the testimony that you have given today?

14 A. Yes. The references I used have the formulas and
15 so forth that may not be in the report, but you have to go
16 to reference to see how it was done.

17 Q. Okay. Perhaps I was unclear because the question
18 I was asking is, does your report contain all of the data
19 that was used? I'm not interested in the formulas. I'm
20 interested in data that was plugged into the formulas from
21 which you drew your conclusions. Does your report include
22 all data that you used in making those computations and
23 drawing your conclusions?

24 A. There's some sediment analyses that's not in the
25 report that I used, but I ended up using five different

1 sediment characteristics which encompassed a broad range,
2 and that sediment is covered in the NRCS -- the soil
3 survey reports, so that would match that.

4 Q. Okay.

5 A. But the actual field samples and analyses, no,
6 all of that is not included in that report, no.

7 Q. Okay. The reason I'm going through this is that
8 under scientific analysis for any scientific conclusion of
9 any validity has to be capable of repetition, correct?

10 A. Yes.

11 Q. If the data that you used is not contained in
12 your report, then that makes it impossible for any other
13 independent engineer to verify the correctness or
14 incorrectness of your conclusions. Is that correct?

15 A. That's correct. However, like I just said, the
16 sediment information would be in the NRCS reports. And
17 using similar approach that I used, you might logically
18 come up with the use of an average of, say, channel width
19 based on the wide range of sediment that's out there. So
20 in that sense, the information -- the information is there
21 for anybody to check it.

22 Q. Okay. And is it my understanding, then, that
23 based upon your report, a person would be able to go to
24 the source data that you used, figure out the way you used
25 that data, and then -- and which data you used, and then

1 apply it to the computations?

2 A. Yes.

3 Q. Okay. And if somebody -- if that information is
4 not available, and it cannot be done, then am I correct
5 that that casts severe doubt on the correctness of your
6 computations if they cannot be duplicated?

7 A. Well, as I can simply -- if they had trouble with
8 that, they can give me a call and I can provide them with
9 information or whatever they might --

10 Q. Sir, your testimony is today. Your testimony is
11 not going to be on the phone with somebody else two weeks
12 from now.

13 My question is, based on the report that you
14 have provided to the commission, and the testimony you
15 provided today, is it all the information necessary for
16 someone to verify your results clearly and readily
17 available for that individual to use?

18 MR. HELM: Pardon me, Mr. Chairman, but if I
19 was in court I'd say, "Argumentative." I don't see -- you
20 had the privilege of yelling at me for yelling at people,
21 and I would like you to stop yelling at my witness. Fair
22 enough?

23 MR. HESTAND: Very good. I'll lower my
24 tone.

25 BY MR. HESTAND:

1 Q. The question still stands.

2 A. The answer basically still stands, yes, you can
3 duplicate it. Now, keep in mind -- I want to put a caveat
4 on it -- there's -- when you go into the hydrology and
5 take a look at that, you're going to have -- there's a lot
6 of references to USGS data in there. Okay. So you will
7 have to -- you might have to go into that if you want to
8 check their methodology.

9 Q. Okay. Then the MRCS reports list ranges of data,
10 not specifically values?

11 A. That's right.

12 Q. Did you use the high, low, or some other value in
13 making your computation?

14 A. As I showed in computation, I took five different
15 particle size medians from the gravel all the way to the
16 silt clay. I computed the width using that, that full
17 range, because my field inspection, of which I showed the
18 photos in the report, showed a wide range. And part of
19 that's due to maybe coarse material coming in from
20 tributaries or whatever, but it was a hodgepodge -- it's a
21 hodgepodge out there and of course the lower end, it's a
22 man-made channel. And based on what I saw, I just
23 computed it five different ways covering this wide range
24 that's NRCS or what my photos show and take the average
25 and make it -- let's make it easy. I didn't -- you're

1 faced with a decision of not to overcompute what's going
2 on here, and it's safer to work with averages because
3 we're taking a general look at this thing. The long-term
4 studies state environment, that's what's going on.

5 Q. Am I correct that with any computation the
6 acronym GIGO is applicable?

7 A. The what?

8 Q. The acronym GIGO -- garbage in, garbage out?

9 A. Oh, okay.

10 Q. Does your report -- and I'll try to keep my
11 volume down -- does your report list all of the
12 calculations that you made with regard to your
13 computations and conclusions, does it show every
14 calculation you went through?

15 A. No.

16 Q. Okay. Does it show the steps that you went
17 through?

18 A. Just a summary.

19 Q. Just a summary?

20 A. But it gives the report that I used.

21 Q. Okay. So that if someone else were to take the
22 data and the results -- the data and the process and come
23 up with a different result, there's no way to check back
24 against your work. Is that correct?

25 A. No. No. You can check it.

1 Q. Do boats float on average?

2 A. Do boats float on average?

3 Q. Uh-huh.

4 A. Whose average?

5 Q. That's my question. If you have a stream that is
6 1 inch and a stream that is flowing at a hundred yards,
7 would your boat float on 50 yards? Does it float on the
8 average?

9 A. 50 yards of depth, width, or -- what are you
10 talking about?

11 Q. Does the average tell you any information at all
12 about whether or not on any particular day the boat will
13 float?

14 A. In the assessment of navigability, the average
15 channel shape and morphology and velocity and so forth
16 tells you a lot about the navigability, yes.

17 Q. Does Mother Nature know that she is supposed to
18 be a certain average on a certain date?

19 A. According to the computations, Mother Nature,
20 i.e., whatever is making the river -- the Gila River what
21 it is, it wants to be a channel like I described.

22 Q. Uh-huh.

23 A. It wants to be kind of a mildly sinuous
24 meandering channel, that's what everything shows. And on
25 the average, that's kind of the shape you're going to get,

1 on the outside in beds, one side of the channel would be
2 deeper, and when it meanders the other way, then the
3 outside of that bed will be deeper, et cetera, et cetera,
4 so there's variation in there.

5 Q. Does your report list all calibration efforts you
6 made with regard to your computations and your
7 conclusions?

8 A. I don't think I really calibrated as such. I did
9 some comparison, but I didn't do any recomputation as
10 such, no.

11 Q. Now, one specific example, you used the sketch of
12 a river channel as the parabolic curve and you have a
13 formula, a power function formula to determine about
14 self-forming rivers, and your formula is W equals small A
15 large Q to the power of small B ?

16 A. Uh-huh.

17 Q. Now, am I correct that in that formula, that
18 formula is it worthless if A and B are not calibrated?

19 A. You have to go into the Osterkamp publication to
20 get it.

21 Q. And am I correct that you did not calibrate?

22 A. No. You plug in the values and out come the
23 coefficient and exponent.

24 Q. So you're saying that you didn't need to
25 calibrate?

1 A. Uh-huh.

2 Q. And is -- you're testifying under oath?

3 CHAIRMAN EISENHOWER: No.

4 MR. HESTAND: Oh, darn it.

5 (An off-the-record discussion ensued.)

6 BY MR. HESTAND:

7 Q. However, as a registered engineer, it is your
8 testimony that in the formula W equals A -- small A ,
9 capital Q , B , that based upon your professional
10 qualifications, A and B do not need to be calibrated?

11 A. Well, there's a fitting process in the
12 computation, if that's what you are getting at. And there
13 are multiple computations involved in it. And I guess in
14 the -- in a very loose sense, you can call that a
15 calibration, but it's not. As you compute several
16 situations and then you look for the crossing of the
17 variables, and that's the point of the final computation.
18 I believe that's what I did. It's been quite a while.

19 Q. Just a moment, I'll follow up.

20 A. Let me ask -- I need to clarify something before
21 we go further. Can I ask him a question?

22 Q. Me?

23 A. Yeah.

24 CHAIRMAN EISENHOWER: It's unusual.

25 MR. HESTAND: I don't care. Depends on how

1 the commission feels about it.

2 CHAIRMAN EISENHOWER: If you want to make a
3 clarifying statement?

4 MR. HJALMARSON: Yes. I want you to clarify
5 what you mean by "calibration."

6 BY MR. HESTAND:

7 Q. Calibration is taking independent data and
8 using -- plugging it into the formula to confirm whether
9 or not you were coming to the proper results in a formula,
10 computer model, something of that nature?

11 A. I don't recall doing it in that fashion, no.

12 Q. Okay. Did Osterkamp do calibration for the Gila
13 River in his general treatise?

14 A. No. I discussed the application of this method
15 for the lower Gila with Osterkamp and discussed -- I know
16 Waite quite well, and I discussed what I intended to do,
17 and he said, "Hey, I've got just the set of formulas for
18 you." And he mailed me that publication because there are
19 several different formulas out there that you can use.
20 However, you get in a lot of trouble with some of them
21 because a lot of them are, say, for bid models. This is a
22 base level stream with perennial flow. And Waite has done
23 a lot of work on those, and he sent me his publication and
24 thought it was good idea.

25 Q. Okay. Now, I apologize if you've answered this

1 one, but to be honest, I don't think you have ever
2 directly answered yes or no. Does the formula -- and this
3 is based upon your qualifications as a professional
4 engineer -- does the formula W equals small A , Q to the
5 power of small B require calibration?

6 A. Not in the sense I use calibration as I explained
7 to you, no.

8 Q. I'm not asking in the sense you used it, I'm
9 asking in the sense that professional engineers will use
10 it. Would other professional engineers expect it to be
11 calibrated?

12 A. Again, I'm having trouble with what you mean by
13 "calibrated." Do you mean do you go out and make a
14 measurement with the current meter to test it or what?
15 What are you talking about?

16 Q. You take sources of data, you run them through,
17 you use --

18 A. What sources of data?

19 Q. Sir, you're the engineer.

20 A. Sir, you're the one that's giving me some kind of
21 hypothetical example. What data? Give me some data.

22 Q. Tell you what, I think the point has been made so
23 we're going to move on.

24 CHAIRMAN EISENHOWER: I do too.

25 BY MR. HESTAND:

1 Q. Now, the report that you in part relied upon,
2 "Predevelopment of the Gila River Indian Reservation," was
3 Burt Thomsen one the two authors of that report?

4 A. Yes.

5 Q. Okay. And am I correct that his determination of
6 predevelopment vegetation was based on aerial photographs
7 from the 1930s?

8 A. I can't answer that. I had -- Burt was -- I
9 employed Burt for a very short time when I initially
10 started this and basically discussed what I was doing and
11 so forth. And I don't recall specifically how he did
12 that. You will have to -- I would recommend that you --
13 he was the author of both of the reports, and then he had
14 junior authors Jim Eychaner and Porcello with him on each
15 one. I would suggest that you go to those reports.

16 Q. Okay. So if the reports indicate that his
17 conclusions are based on aerial photography in the 1930s
18 then that's what it was. Is that correct?

19 A. Whatever he used. I think very highly of his
20 skills and I was -- after discussing it with it I was
21 ready to go and -- but like I showed you, I did three
22 independent checks on it just to satisfy myself.

23 Q. Okay. Are you aware of the fact that during the
24 1890s and the early 1900s that approximately 100,000 acres
25 of mesquite died because of a loss of groundwater and that

1 during the starving years, the Pima Indians were required
2 to harvest that mesquite as firewood in order to feed
3 their families? Are you aware of that fact?

4 A. I'm aware that the mesquite died there and other
5 places.

6 Well, I don't know whether I should answer
7 that with a personal account or not. But during World
8 War II, when my father was in -- overseas in Iceland for
9 seven years, we went to our cabin up in Mingus Mountain
10 with my mother and my brothers, and she hired a fellow,
11 his name was Ambrose Jackson, who was an Indian from the
12 Gila reservation, and he came up there to cut wood and
13 stuff for us. And the reason he came up there is that the
14 wood cutting operation down there was poot, so he was
15 anxious to get out of the heat and come on up.

16 Q. So am I correct, then, that an aerial photograph
17 from the 1930s would not show 100,000 acres of
18 phreatophytes that were cut down in the 1890s?

19 A. Well, again, you better go back to Burt Thomsen.
20 But let's just review this real quickly. I told you that
21 215,000 acre-foot per year was set aside in the
22 groundwater modeling that Eychaner and Thomsen did for
23 losses to along the mesquite and so forth. You do your
24 computations, you guys, and see how big an area that is.

25 Q. Well, mesquite will be considered smaller than

1 100,000 acres based on the fact that mesquite is
2 phreatophytes that drinks all the water it can use?

3 A. He describes his computation.

4 Q. Am I correct that Mr. Thomsen's report -- Strike
5 that.

6 If the commission will be patient with me
7 for just a second if I ask it properly -- ignoring leap
8 years --

9 A. What?

10 Q. In ignoring a leap year -- a normal 365-day
11 year -- in a normal 365-day year, is the median annual
12 flow divided by 365 the same as the median daily flow?

13 A. Median?

14 Q. Uh-huh.

15 A. No. It's not computed that way.

16 Q. Okay. And am I correct that Mr. Thomsen in his
17 report showed only the median annual flow, not the median
18 daily flow?

19 A. He showed the median flow which -- and there is
20 an implication that that's the distribution of daily flow
21 for the year, and -- or instantaneously you get the same
22 thing on percent greater than. It doesn't matter.

23 Q. No, sir. Are you telling me that there is no
24 difference between median daily flow and median annual
25 flow?

1 A. Not when you're looking at a long-term relation,
2 for the purposes of what I was doing, it's essentially the
3 same. You get -- any difference would be insignificant.

4 Q. Okay, thank you.

5 Now, you were asked about the assumption
6 that the Pima and Maricopa Indians had never irrigated.
7 If the historic record established that they irrigated in
8 excess of 35,000 acres, would that have an impact on your
9 analysis?

10 A. Again, if that's what they were doing, then we
11 would have to evaluate how much vegetation was there. So
12 I would have to have all the variables in order to make
13 that assessment.

14 Q. Okay. And back to my question, sir. Would it
15 make a difference in your results?

16 A. It could make a difference.

17 Q. Thank you.

18 A. Small difference.

19 Q. Now, here I'm really not trying to trap you. I'm
20 trying to get something clear.

21 A. I'm with you. I'm trying to help you here.

22 Q. Am I correct that you're testifying that the Gila
23 River below the confluence with the Salt was susceptible
24 to navigation every day even at times of low and high flow
25 based on the skills of the navigator? Is that what you're

1 saying?

2 A. There's a large part of the year where it was
3 susceptible to navigation. Now, it's a real low end. If
4 you notice the relations I produced, I leave the low end
5 out and the high end. I'm leaving a little room there.
6 But nearly all of the time you can put a small watercraft
7 on there, of course the high flows, then your skill comes
8 in. And I personally wouldn't want to be on there in a
9 major flood in anything, or any alluvial river in a major
10 flood.

11 Q. Sir, what I'm understanding is that your
12 theoretical computations --

13 A. Empirical.

14 Q. Empirical. Empirical computations say that the
15 Gila River below the confluence of the Salt was
16 susceptible to navigation most of the days on the year.
17 Is that correct?

18 A. Uh-huh.

19 Q. Why didn't anybody ever use a boat?

20 A. That wasn't my job to assess that. I've been
21 listening to testimony all day and so -- ask a historian.

22 Q. Is it possible that empirical -- if an empirical
23 computation is disputed by actual facts, does that
24 indicate that there might be a problem with the empirical
25 computation?

1 A. Yes, if it's done properly. Now, let's give it
2 an example here. A lot of the accounts of, quote, putting
3 boats on the river occurred after the diversions and
4 storage occurred. And I have been trying to be real clear
5 that this is roughly prior to 1860. Okay. So diversions
6 were rampant over the whole watershed. Sometime during
7 the '60s it was going on everywhere. Okay.

8 Now we hear a lot about the Phoenix area and
9 Swilling's Ditch and all that, but believe me, it was
10 going on up in the Safford Valley, Portales, New Mexico,
11 down in Mexico, up in the Verde, all over.

12 Q. Okay. Sir --

13 A. And that was affecting navigability.

14 Q. Okay. Prior to the first Euro-American arrival,
15 you've been listening to the testimony and you have heard
16 that there is not a single recorded instance of a Pima
17 Indian or a Hohokam Indian ever using a boat on the river.
18 If it were susceptible of navigation majority of the days
19 of the year, what is your explanation for the fact that no
20 Pima Indian prior to the arrival of the first white man
21 ever used a boat?

22 A. That is totally out of my area of expertise.

23 Q. Okay. So there is a possibility that facts and
24 empirical computations may be at loggerheads?

25 A. That's not for me to decide at this point.

1 Q. Thank you.

2 I really am hurrying, folks.

3 You talk about the survey of channels, about
4 the width of the channels, when were those surveys
5 conducted?

6 A. I talked about the survey?

7 Q. Yeah, there were surveys and you used those to
8 determine how wide the channels were?

9 A. Those are the GLO surveys that we've been talking
10 about all day.

11 Q. What are the dates?

12 A. There's a pile of them right here.

13 Q. What were the dates?

14 A. What was the date I say? 1867 to 1892, I believe
15 it was, the ones that I --

16 Q. So they were before the 1905 flood. Is that
17 correct?

18 A. Yes.

19 Q. And would the 1905 flood have changed the river?

20 A. Always. In 1891 it changed.

21 Q. So in actuality, relying on data on the width of
22 the river in 1880 provides you no real use when there has
23 been a '91 -- a flood in '91 and 1905. Is that correct?

24 A. Sir, you've apparently missed the point of what
25 I'm saying here. What I did was reconstructed what the

1 natural flow was, which occurred roughly 1860 to maybe
2 1760, and that's a period that was checked to where the
3 climate and so forth seemed to be pretty constant, and so
4 what I created was -- let's say I reconstructed the
5 natural flow.

6 (An off-the-record discussion ensued.)

7 BY MR. HESTAND:

8 Q. Winding up.

9 Did you compute your water flow based on
10 1912?

11 A. I used the natural water flow.

12 Q. The natural flow based on 1912?

13 A. No. I applied it to the statehood and in
14 conformance with the standard.

15 Q. Did you base it on 1912 channel conditions?

16 A. No.

17 MR. HESTAND: Okay. Thank you.

18 And I thank the commission for their
19 patience.

20 MR. HELM: I have four rebuttal questions.

21 (A recess ensued.)

22 CHAIRMAN EISENHOWER: Anybody have questions
23 for Mr. Hjalmarson.

24 MS. COPELAND: I do.

25 (Mr. Hjalmarson is answering questions.)

1 BY MS. COPELAND:

2 Q. Kirsten Copeland on behalf of Buckeye Irrigation
3 Company, Buckeye Water Conservation Drainage District. I
4 just have a few. Believe me, I want to get home too.

5 Win, as I understand it -- and please bear
6 with me because this is first time I've seen your
7 slideshow and there were a lot of slides and they went by
8 pretty fast, so I'm going to try and take a very broad
9 approach, and if I really screw it up, please tell me.
10 But otherwise we'll be here all night and I don't want to
11 do that.

12 So as I understand it, the point of your
13 study was to evaluate the nature of the morphology. In
14 other words, what the Gila channel would have looked like
15 predevelopment. Is that right?

16 A. That would be the hydrology and the hydraulics
17 and geomorphology --

18 Q. Okay --

19 A. -- reconstructing the natural conditions for
20 those -- for that.

21 Q. So that would be both the shape, meaning of the
22 channel, as well as what was flowing through it and how
23 much?

24 A. Yes.

25 Q. And in your report, you've at least loosely

1 defined predevelopment as being a pre-Anglo diversion. Is
2 that correct?

3 A. Yes. I used the date of 1860 or so and the
4 hundred-year period.

5 Q. So to create your model -- well, I should say the
6 model of the channel including the flow of the channel, as
7 I understand it, you did two things. You took estimates
8 of predevelopment mean channel flow -- I might have to
9 break it up -- so one of the things you took were
10 estimates generated by the USGS of predevelopment mean
11 channel flow. Is that correct?

12 A. Mean, median, and base.

13 Q. Okay. And you also, then, used a technique which
14 is based on sediment size distribution to model the
15 morphology, the shape, if you will, and the width -- the
16 width and depth and shape of the channel?

17 A. Yes. They're empirical relations that have
18 derived from studies of alluvial channels. And then you
19 customize them by inserting the sediment characteristics
20 of your particular alluvial channel.

21 Q. And on the sediment size distribution, as I
22 understand it, you utilized sediment that you had
23 collected yourself out of the Gila basin.

24 A. I used -- I collected sediment samples. I took
25 visual observations. I have been around sediment for a

1 long time so I can make a pretty good visual observation.
2 And I relied heavily on the NRCS soil surveys and the
3 rather general information that's in there. And I matched
4 what I saw and that was it.

5 Q. So the NRCS soil surveys provided you profiles,
6 if you will, against which to evaluate the samples that
7 you took. Is that correct?

8 A. Yeah. Well, my samples agreed with what they
9 published, yes.

10 Q. I'm sorry, were you finished?

11 A. And like I say, I came up with a wide range. So
12 I computed -- used the wide range and then used the
13 median. So if I wanted to get cagey, -- I'm just adding
14 this -- if I wanted to get cagey, I could have picked the
15 one that might benefit whatever outcome I wanted, but I
16 didn't. I just took the average and let's go.

17 Q. But the data set that you actually used to create
18 your channel profile was based on the soil samples -- or,
19 I should say, sediment samples that you yourself took down
20 in the Gila River basin?

21 A. I took my own and -- yes, made visual
22 observations and used NRCS.

23 Q. So how do the sediment that you collected rate --
24 relate to either pre-1912 profiles or any predevelopment
25 profiles?

1 A. Well, what's in channel now is pretty good
2 indicator of what has been there. It's just been
3 remobilized and redistributed. And that, by the way, is
4 another reason why I used this average approach. So keep
5 in mind, I'm reconstructing what was there about 1860
6 so --

7 Q. Nevertheless, the sediment that you collected,
8 you did not attempt to make any determination as far as
9 the time frame in which those sediments were laid down?

10 A. No. I don't think that would be worthwhile.

11 Q. And however those sediments were laid down, they
12 were not laid down under predevelopment conditions. Is
13 that correct?

14 A. Sure. They've been there for years.

15 Q. And as I understand it also, in order adequately
16 to -- well, maybe not even adequately -- but in order to
17 make any sort of a profile, if you will, of the channel,
18 you have to make certain assumptions as to what the
19 overall nature of that channel looks like. Is that
20 correct?

21 A. What do you mean by a "profile" of the channel?

22 Q. The shape of the channel. In other words -- in
23 fact, let me back up a little.

24 I believe that you stated that you assumed,
25 for purposes of your study, that the Gila was, in fact, a

1 single channel under predevelopment conditions?

2 A. I assumed that, and then I tested that assumption
3 with four different tests, yes.

4 Q. And then the conclusion -- you made that
5 assumption, but then the conclusion of your report also
6 was that the Gila was a single-channel stream, a
7 meandering single-channel stream. Isn't that correct?

8 A. Yes. Now it's not fully fair to say that I made
9 this assumption la-de-dah. I have a lot of experience. I
10 knew the slope of the channel, and I knew some
11 characteristics. And just sitting back and eyeballing it,
12 I had a pretty good feel that it was going to be a
13 meandering channel, so I went with that and then checked
14 it.

15 Q. So your study -- or I should say, perhaps, your
16 model, is that a better terminology?

17 A. Well, or method.

18 Q. Method. Your method required you to make some
19 kind of an assumption as to the nature of the channel, and
20 by "nature," I mean whether it was a single meandering
21 channel or the braided-type of morphology that we have
22 been talking about earlier today. Is that correct?

23 A. It was initially assumed and then verified. And
24 when the verification showed that that's what that channel
25 wanted to be in its natural state with variation as we

1 discussed, but that's what it wants to be. And that
2 finalized it.

3 Q. But nevertheless, your methodology assumed a
4 single channel, not a braided channel. And then the
5 outcome of your methodology also concluded that it was a
6 single-channel meandering stream?

7 A. Yes.

8 MS. COPELAND: I have no further questions.

9 CHAIRMAN EISENHOWER: Thank you.

10 Anybody else have some questions?

11 (Mr. Hjalmarson is answering questions.)

12 BY MR. SPARKS:

13 Q. I'm Joe Sparks. A little weary, are you?

14 A. No, I'm doing good. I've got a cup of cocoa
15 waiting for me at home.

16 Q. There you go. That's in Verde Valley where you
17 live?

18 A. Yes.

19 Q. What was that ditch you showed there?

20 A. I'm the Verde Ditch, I have 1867 water use
21 rights. Verde Ditch is one of the oldest -- well, and
22 then it was pre-fort ditch that went through the property,
23 and I live on the old fort farmland.

24 Q. So the old -- the lower ditch -- the old Verde
25 Ditch?

1 A. Yeah, I'm the upper one now, but there was the
2 old lower one. So you know the area.

3 Q. Oh, yeah.

4 Do you have any land that has ever been
5 flooded by that property -- river since you have been
6 there?

7 A. That would be embarrassing. I was a flood
8 specialist. I worked a lot with FEMA when FEMA was
9 formed, and if I got flooded, I'd probably have to move to
10 someplace.

11 Q. I'm not talking about you getting your feet wet,
12 I was just talking about whether any part of your land
13 ever got flooded.

14 A. I'm right on the edge of the -- I'm just outside
15 the hundred-year floodplain, but there's silt and sand
16 there and it's obviously deposited by the river.

17 Q. Another interesting side note was I heard you say
18 something about the base discharge from the Big Chino, at
19 what, .3 CFS, plus or minus two?

20 A. Plus or minus a couple, yeah. During the drought
21 here, it went down to about 19.

22 Q. I just wanted to understand some things about
23 your study which I haven't had a chance to study myself.
24 But my understanding of what you did in working with the
25 1870 -- the 1870 to 1670 (sic) period was you're trying to

1 look at things before major diversions occurred and
2 depleted the flows of the river. And I know that, looking
3 at your curriculum vitae, that most of your work has been
4 done in flood flows, correct? And most of the published
5 work that you have done is flood flow published --

6 A. A lot of the published stuff is. I served two
7 years with the National Academy of Science on alluvial fan
8 flooding situation and that included alluvial processes
9 and -- which apply to this and -- but, yes, generally
10 speaking, I have done a lot work with them.

11 Q. And when you worked with the Corps of Engineers,
12 you went to --

13 A. No, USGS.

14 Q. But didn't you go to some Corps of Engineers
15 studies and seminars on navigability?

16 A. No.

17 Q. No?

18 Is this the only navigability study that
19 you've done?

20 A. Yes.

21 Q. I was wondering, in terms of the baseline water
22 that you used, my understanding is you took the two
23 studies -- USGS studies, one on the Salt River Pima
24 reservation on the Salt River, one on the Pima reservation
25 on the Gila River, and you looked at the total amount of

1 water shown on the mean or average, the median, and the
2 base flow and then you moved that downriver to the
3 junction of the Gila River and the Salt and you reduced
4 that flow by 215,000 acre-feet per year for phreatophytes
5 evapotranspiration, right?

6 A. No. That was done in the groundwater modeling
7 and that came out of the wash, so to speak -- or out the
8 model. So the -- both reservations were modeled by the
9 USGS. And they had an inflow amount and an outflow
10 amount, and I took the outflow amounts and combined them.

11 Q. Then did you pick those two numbers up, set some
12 numbers, and move them down to the junction of the Gila
13 with Salt?

14 A. Yes.

15 Q. And you presumed that they were neither loss nor
16 gains between those two distances?

17 A. Yes. It wasn't a significant distance.

18 And it's a complicated area too, because the
19 groundwater from the Gila River goes over to the Salt. So
20 there's budgeting and everything and kind of had a
21 coalesce environment in a sense.

22 Q. I know more about this than I'm letting on here,
23 but I'm just trying to make a record here.

24 A. I know, I've been listening to you guys.

25 Q. So what I'm just trying to get is the basic -- a

1 basis here for the commission.

2 And that 1760 to 1870 period, I noticed in
3 curriculum vitae you studied the vegetative changes on
4 watersheds and the change in production of watersheds as a
5 result. You did that, didn't you?

6 A. I studied that for it's years on Sycamore Creek,
7 and I have been involved in that as part of my career in
8 service water hydrology.

9 Q. Have you found that the impact of grazing animals
10 on the watershed changed the runoff of the watershed?

11 A. There are studies on that that have confirmed
12 that. I believe some of them are up in Wet Beaver Creek
13 and around, yes.

14 Q. And the nature of that change is that it causes
15 the runoff to occur more rapidly. Isn't that correct?

16 A. That might depend on where you're at, and I'm not
17 prepared to really --

18 Q. On the Gila watershed, did you take a look during
19 the period of 1760 to -- 1670 to 17- -- excuse me, 1879 to
20 1770 and take a look at what the impact of the runoff and
21 the grazing animals would be?

22 A. No. Like I say, I reviewed the work that Thomsen
23 and others did and was satisfied with it and went with it.

24 Q. When you mentioned that the advent of up to
25 18,000 stock ponds, that might be a fairly conservative

1 estimate of that?

2 A. I tried to elaborate on that. Those are the
3 filings with ADWR, and I'm sure there's a lot more stock
4 tanks.

5 Q. Would you say that the 18,000 stock ponds had a
6 substantial impact on the amount of water making it to the
7 river?

8 A. When you look at those kind of numbers, it could
9 be a factor, yes, because a lot of those ponds were put on
10 strings and so forth.

11 Q. Now, I want to just go down to the methodology
12 that you used. And you concluded, based on the two
13 studies that your colleagues had done on the Salt River
14 Pima and the Gila reservation, that there was 290 cubic
15 feet per second of base flow in 1770, at least, at the
16 junction in the Gila River.

17 A. Hold on. There's a third colleague now. There's
18 Anderson and Freethey. Freethey and Anderson did the base
19 flow report.

20 Q. But they didn't -- did they do a base flow
21 estimation for the Gila below the junction of the Salt?

22 A. Yes. They did a base flow analysis for all of
23 the alluvial basins and the basin and range physiographic
24 province in Arizona.

25 Q. So its base flow estimate are the number that you

1 used in your study, 290 cubic feet per second was their
2 number for the Gila at the base -- the Gila after the Salt
3 joins it?

4 A. Yes, sir.

5 Q. And that period would have been from 18- --
6 whatever, a hundred years ending in 1870?

7 A. In their report, they didn't give a hundred-year
8 period. Thomsen did. And I just -- they just said it was
9 a predevelopment number, and based on their analyses of
10 stability in regard to climate and so forth, I figured
11 that what's good for the median is good for the base.

12 Q. Okay. Now the base flow is something that we
13 could count on all the time, right?

14 A. Well --

15 Q. If there is no -- if there are no other
16 diversions, the base flow is what's there in the river all
17 the time?

18 A. Yeah. And you don't -- I have taken a simplistic
19 definition of this. The base flow can be much greater,
20 say, during early spring runoff and it can change. The
21 base flow is there year-round and superimposed on it, so
22 to speak, on the side of that flow duration curve is the
23 direct runoff.

24 Q. Well, then, that wouldn't truly be the base flow
25 used in simplistic -- then you really weren't dealing with

1 base flow?

2 A. Well --

3 Q. The base flow -- the base flow that I'm talking
4 about and the one engineers typically use is the one where
5 it is not adjusted at all for contributions from the
6 surface. It simply is what yields up from the groundwater
7 to the flow on the river at all times, right?

8 A. That would be called the flow. If you called it
9 runoff, then using USGS, then it would be the natural --
10 the natural and --

11 Q. I'm only talking about base flow.

12 A. Okay. Well, the way I used it, it is the base
13 runoff.

14 Q. The base runoff. So it's supplemented by runoff?

15 A. It's the natural flow at -- 90 percent of the
16 time, it will be that amount or more and that is a
17 contribution from only groundwater.

18 Q. Okay. Let's get to this, then. When you took
19 your 22 surveys of the river, which showed from which you
20 derived your cross-sections, the width of the river.

21 A. 122.

22 Q. 122, I left off a hundred. Okay. You show
23 various widths from about 153 feet to almost 300 feet in
24 terms of the riverbed width over which you distributed
25 that --

1 A. That's the watered.

2 Q. Over which -- let me just finish this -- over
3 which you distributed the flow of the 290 cubic feet,
4 correct?

5 A. No.

6 Q. Okay. Then when you did those cross-sections,
7 what did you assume about the distribution of the
8 290 cubic feet per second of base flow?

9 A. I used the relation -- the width duration
10 relation I showed you, which is basically computed using
11 kind of a flow duration relation, and that width duration
12 relation is computed as a function of discharge, so it
13 covers a wide range of discharge.

14 Q. Okay. So what we have here is we don't have an
15 even distribution over your channel width as you
16 calculated it for this 290 cubic feet of base flow? It
17 isn't considered uniform across the cross-section -- your
18 perfect cross-section of your river.

19 A. I think you're mixing hydrology and geomorphology
20 and hydrology.

21 Q. I'm trying to, certainly.

22 A. Let's see. We have a width relation -- a width
23 duration relation that can cover -- that can correspond to
24 a discharge range of, say, a 130 or whatever on up to a
25 few thousand.

1 Q. But I'm isolating this to the base flow.

2 A. Just to the base flow?

3 Q. Yes, sir.

4 A. Okay. Now the distribution, then, of that base
5 flow across the channel would be a function of the channel
6 characteristics and it would not be uniform.

7 Q. But you assume, in your analysis, that it is
8 uniform, that it's a smooth curve --

9 A. Well, I assume a uniform -- or a shape that's
10 described by a parabola, but then the flow characteristics
11 across the channel, velocity and depth, of course, vary.

12 Q. And then, as you explained to the committee, when
13 something goes around a curve, the outside bank -- the
14 depth of water in the outside bank is going to be deeper
15 and the inside of the curve, it's going to be shallower to
16 nothing, right?

17 A. Yes.

18 Q. Okay. And then when you did your 122 surveys,
19 none of those surveys showed the depths of the channel,
20 did it -- did they?

21 A. I didn't use that. There were observations by
22 the surveyors that have been discussed some today. 12 to
23 15 feet, for example, in one spot. But I didn't use that
24 information, no.

25 Q. And when they did that, they didn't say to the

1 depth of water or to the depth of the stream, did they?

2 A. No. No. But what they did record, rather
3 precisely, was the width along those section lines.

4 Q. Along the section lines.

5 Now, there's two things that you told the
6 committee -- the commission that you didn't tell and that
7 was even though you had the length of the stream, the
8 width of the stream is a cross of, let's say, north-south
9 township line. You didn't have the degree of the river
10 angle, and so you calculated that using a formula that
11 ranged from zero to 90 percent and did a distribution,
12 right?

13 A. I assumed a uniform probability distribution.

14 Q. So that number, you didn't add that percentage.
15 And when you used the cross-sections, you also did not
16 have the depth at all under any circumstance from those
17 surveys, did you?

18 A. Not really. The ones I did have, and I threw
19 them in the report here in Appendix C, I showed that
20 they -- that is mostly just for an interest standpoint.

21 Q. Right. But for your purposes of your
22 calculation, you didn't have that at all, you derived that
23 number?

24 A. That's exactly right.

25 Q. And you used a numeric model to do that?

1 A. I used that equation I showed.

2 Q. I thought you used a model -- no computer model?

3 A. Well, Burkham's equation is rather complicated
4 and it behooves the computation to use a computer program
5 for that, which I have.

6 Q. So did you do a numeric model for this to derive
7 these depths?

8 A. In a sense you could call it a model, yes. I
9 programmed the computer and input the variables and
10 computed the result.

11 Q. And so by computing the these variables, you
12 derived them exclusively from geometry and these formulas,
13 correct?

14 A. Yes, and the sediments.

15 Q. And then when you used topographical surveys to
16 try and determine the depth and width of the stream bed,
17 wherever you have a topo, it was at a scale that was not
18 helpful for depth of the stream bed, was it?

19 A. You better believe it. It was a -- you used the
20 term a minute ago and is a swag.

21 Q. Okay. Well, I'm not going to get into what swag
22 means, particularly in northern California, so I'm going
23 to try to keep right here to geology and things like that.

24 Did you, at all, do any physical
25 cross-sections of any location at any one of your data

1 points along the river to check, say, in paleolithic
2 sense, the accuracy of your calculations for or your
3 estimations for where the stream bed was and the depth of
4 it at any one location?

5 A. All I did was use the surveyed sections from the
6 GLO.

7 Q. So the answer is no?

8 A. Yes.

9 Q. Now I want to go from -- so -- and so you didn't
10 use any program that I might recognize in your numeric
11 modeling for purposes of this evaluation? Any computer
12 model?

13 A. No. I have Minitab, which is a pretty
14 sophisticated set of software for engineering and
15 statistical computations, so if you're familiar with that,
16 then -- I loaded it all into that.

17 Q. But that's not really a computer model for
18 purposes of developing, it's just to do the calculations
19 quickly?

20 A. It's a number cruncher.

21 Q. Okay. And the -- what is the elevation above sea
22 level at the point where the Gila meets the Salt -- what's
23 the elevation above sea level of the riverbed there?

24 A. I don't know. It's a few hundred feet, but I
25 can't remember. I can tell you the slope of the channel.

1 Q. I heard you tell the slope, and I wondered what
2 the elevation where it meets the Colorado was?

3 A. I forget what it was.

4 Q. Okay. Now, I want to go from the base flow to
5 your median and your average flows. You're familiar with
6 the concept of the bank storage, aren't you?

7 A. Sure.

8 Q. And you're familiar with the concept of a wetting
9 front?

10 A. Yes.

11 Q. And when the base flow of a river, by
12 precipitation, starts elevating in the riverbed, would you
13 explain to the commission what the wetting front is?

14 A. Well, the wetting front is as the water level
15 rises, the water will go into the banks and wet the banks
16 and kind of moves as a quasi-saturated front.

17 Q. And as the level goes up, the banks take more and
18 more water, correct?

19 A. Yes. It goes out more and more laterally.

20 Q. Did you do any analysis of the transmissivity or
21 bank storage capacity of either or both banks of the Gila
22 from -- in your study -- in the length of your study?

23 A. It wasn't necessary. Out of the scope of what I
24 was doing.

25 Q. So you, in calculating the 170 cubic feet that

1 reached the Colorado River, just accepted the number in
2 the report that -- the reports that you used previously?

3 A. I used Freethey and Anderson for that, yes.

4 Q. Okay. For purposes of the Gila Valley, basically
5 everything that we see except a mountain sticking up out
6 of it or big rocks sticking up out of it with no known
7 foundation that we can see it's a giant alluvial fill
8 of -- over geological time, isn't it?

9 A. Yes, and I think geologists would look at that as
10 several valleys, but yes, there is a big -- well, it's
11 part of the base and the range as you cross a province so
12 you have these alluvial filled valleys all over the place.

13 Q. And one of the things you mentioned is that --
14 that troubled me is that the diversion started really
15 early from the Togad Indians. But I think you said
16 something that sort of hit a nerve for me in the upper
17 Gila Valley. You said they were -- the non-Indians were
18 diverting water earlier than 1860 in the upper Gila
19 Valley?

20 A. The diversions were starting in roughly the
21 1860s.

22 Q. Are you aware of the Gila Decree?

23 A. Yes, I am.

24 Q. Do you know what the earliest non-Indian
25 diversion is in that decree?

1 A. Not specifically, no.

2 Q. Okay, I will tell you it's 1872. So would there
3 be diversions earlier than that that you're aware of?

4 A. You'll have to -- okay, are you aware of the Gila
5 in the state of New Mexico?

6 Q. Certainly.

7 A. What's the earliest diversion there?

8 Q. Not that early.

9 A. Not that early? Okay. And I made a general
10 statement about -- I used roughly 1860. I also on Thomsen
11 and his reports, they used 1870. I didn't quibble about
12 it, but to keep myself covered in what I'm saying here,
13 I'm using roughly 1860 because I know -- I'm on an 1867 --
14 I have an 1867 waterway. And I recognize there was an
15 early -- so there were diversions in the area that early.

16 Q. Not only do I know your water right, I know where
17 you got it.

18 A. Okay.

19 Q. But that's for the Verde, not here.

20 A. Well, the Gila watershed -- I'm speaking -- let
21 me be general, I don't want to get too specific, but in
22 Gila watershed, I'm using roughly 1860.

23 Q. But I thought we were on the Gila from junction
24 of the Salt down?

25 A. Yeah. But the watershed flows into it and

1 diversion anywhere in the watershed will affect what's
2 going on in.

3 Q. So you weren't necessarily talking simply on the
4 Gila or the Blue or the San Francisco or the San Simon?

5 A. No, I'm talking the watershed.

6 Q. Do you remember as a USGS guide when there used
7 to be a gauge in the San Simon?

8 A. Yeah.

9 Q. And there isn't one now, is there?

10 A. You know, I retired in '93, and I quit paying
11 attention to them.

12 Q. You're one of the wise guys, and I mean that in a
13 complimentary sense.

14 A. I retired one week before the flood.

15 Q. Before what?

16 A. Before that big flood hit.

17 Q. Well, now there's no gauge there because there's
18 nothing that comes out of it. And I think maybe your
19 reference to the continued pumping within these basins
20 is --

21 A. It's destroyed it, in a sense. From a surface
22 water sense, it's destroyed it.

23 Q. Right. I guess what I had was then what you did
24 was you didn't have any actual data, you had the estimated
25 data of earlier works by your colleagues and those

1 estimates were based probably on regressive analysis of
2 and referred by a number of ways including tree rings, you
3 said?

4 A. Yes. That's what they say in the report.

5 Q. And in those -- in those -- and so for your
6 purposes -- I know you said this before -- that's the
7 entirety of the data that you used?

8 A. Those three reports were -- comprised the
9 hydrology, and then I used an independent check that I
10 described.

11 Q. Yes. Okay. Now, I guess the final question I
12 have -- since I'm probably the only guy in here that was
13 born and walking around at this time -- do you have an
14 opinion as to whether the Gila River at the junction of
15 the Salt and the Gila was navigable in 1912?

16 A. No -- okay, I think there was some pools and
17 stuff in there so you might be able to go around a little
18 pond, but no, not navigable in the context of what we're
19 talking about.

20 MR. SPARKS: Okay, thank you.

21 CHAIRMAN EISENHOWER: Is there any other
22 questions for Mr. Hjalmarson?

23 MR. HELM: Just a couple in rebuttal just to
24 clean up the record.

25 MR. HJALMARSON: I thought we were friends.

1 MR. HELM: We are.

2 MR. SPARKS: The only nasty stuff, I said.

3 MR. HELM: I don't have one question about
4 anything you said.

5 BY MR. HELM:

6 Q. But I do have a question. Everybody, you have
7 been hit by about -- I think Mark and Buckeye Irrigation
8 about the use of the word "assumption." And lawyers get
9 all excited about using that word "assumption," right?
10 But I sat here and listened to what you said, and didn't
11 you really say that you established a premise and then you
12 verified a premise, and then when I was in school, I
13 thought that's what they called the scientific method. Is
14 that what you're doing?

15 A. Yes, sir.

16 MR. SPARKS: Yeah, but they were still using
17 rock chisels to make marks on the wall.

18 MR. HELM: We made square wheels, but I mean
19 it was good.

20 BY MR. HELM:

21 Q. What you're talking about, you were following
22 basic scientific methodology to come up with a premise and
23 then check it?

24 A. Yes.

25 Q. Okay. Now somebody -- and I can't remember

1 who -- asked you about have you ever heard about any boats
2 going upstream on the Colorado and you sat here for
3 two days -- and haven't you heard the discussion about the
4 steamboat running up the Gila to Dome?

5 A. Yes, and I've actually read about it.

6 Q. So you have heard about steamboats going up the
7 Gila?

8 A. Yes, I have.

9 Q. Okay. Do you recall from the Gila litigation --
10 are phreatophytes a slow-growing plant?

11 A. No.

12 Q. Grow real fast, don't they?

13 A. They can grow. You give them water and sunshine
14 and hold on. It's like Iowa, you can hear the corn grow.

15 Q. Can a phreatophyte reestablish pretty quickly?

16 A. Yes.

17 Q. I believe with the attorney from the Buckeye
18 Irrigation District we got into non-hydraulic factors.
19 Now, there was a discussion and you indicated that one of
20 them was commerce, I think. Could you just give us a list
21 of the non-hydraulic factors that you were referring to at
22 that spot in your report, that she was questioning you
23 about -- just give us the whole list.

24 A. Wow. Well, it has been a while since I made the
25 computation, but it was a lot of stuff related to the

1 conducting of business. And there's a variety of
2 activities where you might want to ship products on a
3 river and barges or -- it's just, in general, that type of
4 activity. A barge with lumber or floating logs, et
5 cetera.

6 MR. HELM: I don't have any other questions
7 of this witness.

8 CHAIRMAN EISENHOWER: Are there any further
9 questions for Mr. Hjalmarson?

10 Hearing none, thank you very much for
11 participation, Mr. Hjalmarson.

12 MR. HJALMARSON: My pleasure.

13 CHAIRMAN EISENHOWER: Mr. Helm, seven years
14 ago I got a kidney transplant. My doctor told me, "Drink
15 lots of water." I brought three bottles, bought three
16 more. I might have brought a case if I had known we were
17 going this long, so please expedite us. And you know, I
18 might love you, but my wife is thinking other things right
19 now, so.

20 MR. SPARKS: I know his wife and you better
21 be careful.

22 MR. HELM: This won't take very long. What
23 I said was true, I've eliminated --

24 MS. DOYLE: Cheryl Doyle from the Arizona
25 State Land Department. And I just wanted to know if

1 Mr. Jon Colby could go to the top of the list, if that's a
2 possibility.

3 CHAIRMAN EISENHOWER: When does he need to
4 leave?

5 MR. COLBY: About 5:00.

6 CHAIRMAN EISENHOWER: Five minutes.

7 MR. COLBY: 5 o'clock this evening is when I
8 should have been out of here.

9 MS. DOYLE: He came here at 3 o'clock.

10 CHAIRMAN EISENHOWER: I think you missed
11 your bus.

12 MS. DOYLE: It will be really short.

13 CHAIRMAN EISENHOWER: Come forward
14 Mr. Crosby (sic).

15 MR. COLBY: My name is Jon Colby, and I'm
16 not a scientist or a lawyer. I'm involved in commerce.
17 We ship things down the river. We ship people down the
18 river. I'm the co-owner and managing partner of Cimarron
19 Adventures & River Company. We're a Scottsdale-based
20 river rafting to your tenure operator, and we've conducted
21 tours on the Salt and Verde and Gila rivers for 17 years.
22 And I promised the chairman in interest of expediency I
23 don't need to address the commerce today about the Gila.
24 But we have done commercial tours on the Gila,
25 specifically the section of the Gila River in what's now

1 called Gila Box National Riparian Conservation Area
2 outside the town of Safford, just downstream of Duncan,
3 Arizona, to just outside of Safford. And done private
4 boating in that area as well. And have done -- I've been
5 private boating on the section of Gila River downstream of
6 Coolidge Dam in the vicinity of Winkelman, Kearney,
7 Riverside area. We've done our tours in water as slow
8 as -- about a 170, 180 CFS up to about 3,000 cubic feet
9 per second. And we don't make -- haven't made heavy use
10 of the Gila River at all, but we have conducted tours in
11 that area and found it to be a pretty exceptional part of
12 our business.

13 CHAIRMAN EISENHOWER: Any questions?

14 COMMISSION COUNSEL JENNINGS: I would
15 like -- for Mr. Brashear, who is not here, he's very
16 interested in this part of it.

17 (Mr. Colby is answering questions.)

18 BY COMMISSION COUNSEL JENNINGS:

19 Q. How long are your tours on the Gila Box and down
20 from the Coolidge Dam area?

21 A. The area below Coolidge Dam, we didn't run
22 commercially. I've done that privately in my boat just
23 for the day. The trips in the box were two to three days.

24 Q. And I don't want to get any business secrets or
25 anything, but one of the questions is commerce on this.

1 Can you give us some idea of what the arrangements are,
2 for example, how much do you charge for a passenger and
3 what services do you provide to him on that to your?

4 A. Our Gila Box tours cost about \$250 a day with a
5 certain minimum number of people. We've got a minimum of
6 four people required for the to your, and that includes
7 transportation from the greater Phoenix area to the put in
8 at the river. All the food and kitchen equipment, all the
9 sanitary facilities, guides, rescue and safety equipment.
10 The specialized equipment that we use that meet regulatory
11 environmental regulations that are imposed on us by the
12 Bureau of Land Management and the transfer back from the
13 river to the greater Phoenix area.

14 Q. So although it's a little shorter, it's very
15 similar to the services provided on the Colorado River
16 from Lees Ferry down?

17 A. Yes, sir, very similar.

18 Q. There was some other question I had.

19 COMMISSIONER HENNESS: While you're thinking
20 of it, Mr. Chairman, I would like to ask a question.

21 CHAIRMAN EISENHOWER: Certainly.

22 COMMISSIONER HENNESS: Did I understand you
23 to say that you do commercial floats below the dam or you
24 just did it private?

25 MR. COLBY: Our company does not offer

1 commercial floats below the dam.

2 COMMISSIONER HENNESS: I figured that.

3 Thank you.

4 MR. COLBY: In fact, if I could follow up on
5 that, we had the opportunity to and we chose as a business
6 decision not to take advantage of that. At the time we
7 made that decision, there were other companies offering
8 that to your and for a number of reasons, we decided just
9 not to pursue it.

10 COMMISSIONER HENNESS: So there are firms
11 that you can hire to do that flow trip?

12 MR. COLBY: There have been in the past. I
13 don't know that there are right now, but that was the
14 case.

15 COMMISSIONER HENNESS: Thank you.

16 BY COMMISSION COUNSEL JENNINGS:

17 Q. Do your guides, on these trips in the Gila Box,
18 also provide hikes to scenic areas off the river?

19 A. We do some side hikes, yes. It kind of depends
20 on the needs of the group, how much time they have, and
21 what their interests are. That does occur occasionally,
22 yes.

23 Q. And you do camp other than along side the river?

24 A. Yes.

25 Q. Okay.

1 COMMISSIONER ECHEVERRIA: Take any fly
2 fishing?

3 MR. COLBY: No, it's not really fantastic
4 fly fishing in that area.

5 BY COMMISSION COUNSEL JENNINGS:

6 Q. Do you have to get a permit from the Bureau of
7 Land Management or some other government agency?

8 A. Yes, the BLM permits both those sections of river
9 that I referred to.

10 Q. She mentioned fly fishing, is there other types
11 of fishing?

12 A. Yeah. I've seen catfish come out of there. I'm
13 not a warm-water fisherman, but I know that there are
14 catfish in the river. I've seen carp and suckers and
15 there are probably dozens of fish species and I'm not an
16 expert at addressing that, but there is fishing there.

17 Q. So it's bait fishing that you would be using if
18 they do?

19 A. If -- yeah, if I was going to be fishing, it
20 would probably be bait fishing.

21 COMMISSION COUNSEL JENNINGS: I have no
22 other questions.

23 CHAIRMAN EISENHOWER: Okay. Thank you.

24 How do you spell Colby?

25 MR. COLBY: C-o-l-b-y.

1 CHAIRMAN EISENHOWER: Are there any
2 questions for Mr. Colby?

3 (Mr. Colby is answering questions.)

4 BY MR. SPARKS:

5 Q. I'm Joe Sparks. In this particular question --
6 series of questions I ask -- I'm representing San Carlos
7 Apache tribe.

8 What was the lower limits of the tours that
9 you used for flow purposes?

10 A. The lowest to your that we did, I think we
11 started on about 170 or 180 CFS at the put in, and then
12 the San Francisco River contributed some additional flow,
13 so it was higher than that as we got farther down.

14 Q. So would you tell the commission where you put
15 in, the location?

16 A. That put in is -- I believe it's called the BLM,
17 the old bridge picnic site. It's where the old highway
18 that comes out of Safford to Clifton-Morenci crosses the
19 river. It's a semideveloped access point by the BLM.

20 Q. And it's below the Duncan Verde Valley, right?

21 A. Excuse me?

22 Q. Below the Duncan Verde Valley?

23 A. Yes.

24 Q. Are you familiar with -- where is your take out
25 point?

1 A. The take out is one of two, either Bonita Creek
2 or the old Solomon Road, both of those are just upstream
3 of the town of Safford.

4 Q. Are you familiar with the San Jose Canal
5 diversion?

6 A. Yeah. One of our takeouts is just downstream of
7 that, I believe. I may not be as familiar with it as I
8 would like to think I am.

9 Q. Well, the San Jose canal diverts the entire river
10 up to 400 cubic feet per second into the canal, so from
11 then on, you'd be rafting in the canal. So did you do any
12 rafting in any canals in that area?

13 A. Part of the lower section of the Gila looked like
14 it might have been altered in some way, but I can't say we
15 were in a canal. I mean, I wouldn't have recognized it as
16 such.

17 Q. So it's unlikely that you rafted -- have ever
18 rafted below the San Jose diversion, correct?

19 A. I would say that that's probably likely. The
20 roads that we used to drive to lower put in is called the
21 San Jose Road, but it must have been above that diversion,
22 I would guess, yes.

23 MR. SPARKS: Thank you.

24 MS. HACHTEL: My name is Laurie Hachtel for
25 Arizona State Land. I just have a couple of questions

1 just to clarify, Mr. Colby.

2 (Mr. Colby is answering questions.)

3 BY MS. HACHTEL:

4 Q. Can you tell me as far as -- is there one type of
5 boat that you use for these tours or are there different
6 types?

7 A. No. Because of the fluctuating flow, we have
8 to -- pretty variable. We've done everything from 18-foot
9 rafts down to inflatable kayaks and canoes and a
10 specialized craft called a cataraft.

11 Q. And what is the maximum number of people that
12 usually take one of these tours?

13 A. In the tours through the Box, they are pretty
14 small; the largest group that we had there was 11 people.

15 Q. And can you give me some idea as far as how much
16 weight with supplies, people, that normally are in one of
17 these or a certain number of people, give me an average
18 number that are usually on the tours, estimate the weight?

19 A. I would say that for a large group like that, an
20 11-person trip, the boats were probably weighing -- the
21 dunnage on the boats is probably somewhere between 800 and
22 1200 to 1500 pounds, that's not clear of the weight of the
23 boat.

24 Q. And what type of boat are you using for 11
25 people?

1 A. There would be several boats, but that 11-person
2 trip is all on rafts, 18-foot rafts, 14-foot rafts.

3 MS. HACHTEL: No further questions. Thank
4 you.

5 COMMISSIONER HENNESS: Mr. Chairman, one
6 quick question, all of these are oar trips?

7 MR. COLBY: We do a combination of oar and
8 paddle trips.

9 COMMISSIONER HENNESS: And paddle is not
10 powered?

11 MR. COLBY: No, they're not -- they are not
12 motorized, no.

13 CHAIRMAN EISENHOWER: Seeing nobody else
14 wanting to question, thank you very much. Thank you for
15 coming. I'm sorry about the long delay.

16 Okay. Here we go.

17 (An off-the-record discussion ensued.)

18 (Dr. Littlefield is answering questions.)

19 BY MR. HELM:

20 Q. Dr. Littlefield, let's see if we can get through
21 this real quickly.

22 Referring to page 109 of your report, in the
23 middle of that page, you have a large quote and you're
24 talking -- I believe that this quote from -- I think it's
25 Michler supports a conclusion earlier that a guy named

1 Emory made, and you say that the Gila was not navigable by
2 indicating only the Colorado was useful for boats. Could
3 you give me the specific language in there that says the
4 Colorado -- that either -- only the Colorado was used for
5 boats or says that the Gila is not useful for boats? I'll
6 take it either way.

7 A. The quotes -- excuse me, this is quoting
8 Lieutenant Nathaniel Michler, M-i-c-h-l-e-r, who authored
9 chapter 7 of William Emory's report. William Emory's
10 report was recorded in the United States and Mexican
11 boundary survey, which I believe was originally published
12 in -- I believe it was the 1850s, I don't know the exact
13 date right now. The quote says that -- this is
14 Mr. Michler commenting on the Gila River and the Colorado.
15 "The Gila becomes so low that a sand-bar forms at its
16 mouth during the summer, and at no time does it supply
17 much water. The Colorado on the contrary, is navigable
18 for small steamers, drawing two and two and a half feet
19 water, as high up as Fort Yuma ..." And then he goes on
20 to comment about the navigation on the Colorado.

21 Q. That doesn't say that the Gila is not navigable,
22 does it?

23 A. Well, he says "the Colorado on the contrary," and
24 I took that to mean that he's juxtaposing the navigability
25 of the Colorado against something else and the only other

1 thing in his statement is the Gila.

2 Q. Talking about small steamers?

3 A. Yes. He's representing small steamers.

4 Q. You could have navigation, wouldn't you admit,
5 with something less than a small steamer?

6 A. I'm only commenting on what Mr. Michler had to
7 say in his observation at the time.

8 Q. Referring you next to page 111. And this kind of
9 goes to the next, kind of -- I guess 112, 113, 114, and
10 the pictures that you've got that run through 118. You
11 say these pictures -- I believe it is -- I'm sorry, I gave
12 you the wrong page. It should be 113. That these
13 pictures depict the area where our famous Buckey O'Neill,
14 I guess, was playing in the mud. Is that what you're
15 meaning?

16 A. Yes, there on the Gila River between the Salt and
17 the Colorado.

18 Q. Depending on which trips, you look at somewhere
19 between 59 and 60 years after Buckey played in mud, aren't
20 they?

21 A. Roughly.

22 Q. How do you know that they are representative of
23 pictures of the area where Buckey played in mud?

24 A. Geographically I know where the photographs were
25 taken based on the archival source citation.

1 Q. Okay. How do you know that that location
2 couldn't have changed in 60 years?

3 A. It very well may have.

4 Q. So you don't know that those are fair
5 representations of the river at the time Buckey played in
6 the mud at that area?

7 A. No. They only are representations of the river
8 for the time that the caption says they are.

9 Q. Some 60 years later?

10 A. Yes.

11 Q. Does a river have to be reliable to be navigable?

12 A. I think that's a legal conclusion with respect to
13 what constitutes navigability.

14 Q. Are you familiar with a Supreme Court case called
15 Holt State Bank?

16 A. No, I'm not.

17 I should correct that, with the extent of
18 Mr. Jackson's testimony earlier today, whatever he put on
19 the screen. Other than that, I'm not familiar with it.

20 Q. You haven't read it or want to express any
21 opinions, historically, about how it fits into the scheme
22 of the jurisprudence of navigability?

23 A. No, I couldn't comment on it.

24 Q. Now, you, I guess, stated in this report the
25 opinions of this vast majority of people who viewed this

1 river at varying times over a period from about -- I think
2 your earliest one is 1775 to 1941, maybe, somewhere in
3 there?

4 A. Roughly.

5 Q. First of all, you would consider, as a historian,
6 that to be an appropriate span of time to look at what
7 people thought about the Gila River for purposes of
8 determining its navigability?

9 A. Yes. And I think most of my -- the bulk of my
10 sources really focus more on the middle of the 19th
11 century up to the time of statehood, but some of the
12 others are earlier and some are later.

13 Q. Okay. And the conclusion of all of the people,
14 you're not saying -- and I'm trying to say this
15 all-inclusively -- that what happened that was said in
16 some letter or historical document that you used or what
17 didn't happen, boat didn't float, for example, versus the
18 boat floated, were opinions under -- that these people
19 were rendering under the ordinary and natural course of
20 the river?

21 A. No, their opinions of the way they perceived the
22 river to be.

23 Q. And last, but not least, in your summary and
24 conclusions section of your report, is it fair to
25 characterize that as just a summation of everything that

1 you have said in the body of the report?

2 A. Yes.

3 MR. HELM: I have no further questions.

4 CHAIRMAN EISENHOWER: Thank you, Mr. Helm.

5 (Dr. Littlefield is answering questions.)

6 BY MR. SPARKS:

7 Q. Doctor, my name is Joe Sparks and for this series
8 of questions, I'm asking them on behalf of the San Carlos
9 Apache tribe, which is located on both sides of the Gila
10 River in Eastern Arizona. Are you familiar with that
11 reservation?

12 A. Yes.

13 Q. Probably no group of people are more sensitive to
14 the Treaty of Guadalupe -- Hidalgo Guadalupe -- Hidalgo
15 and against the treaty that my clients, because they
16 consist of the successors from the Chiricahuas, the Gilas,
17 the members of Apaches, the Kuyateros, the western
18 Apaches, including the western bands and southern bands of
19 Tonto Apaches, so there were a lot of ways for my clients
20 to get in trouble once the United States and Mexico made
21 the first Treaty of Guadalupe Hidalgo because it split --
22 it took into United States jurisdiction, for our purposes,
23 the land from the Center of the Gila River north, which
24 had been previously under Spanish jurisdiction. Is that
25 right?

1 A. Mexican jurisdiction, yes, that's correct.

2 Q. Well, I guess I went way back. Spanish, then
3 arguably for a day France, and then Mexico, and then -- so
4 at that time, Mexico?

5 A. Yes, that's correct.

6 Q. My clients could get in trouble for going to
7 Mexico; under that treaty the United States promised to
8 keep -- they refer to them as savages, they don't refer to
9 themselves that way. The other savages are the savages as
10 far as they're concerned -- but they could get in trouble
11 for going into Mexico, which meant that if they walked
12 past the Center line of the Gila River, they were in
13 Mexico. And so then the Gadsden Treaty came about and the
14 other side of the Gila River down to where the Mexican
15 border and the United States is now took that controversy
16 out of play.

17 But one of the things that was interesting
18 to me, and I think the commission would have to clarify,
19 is the discussion about navigability of the Gila River for
20 purposes of the international Treaty of Guadalupe Hidalgo.
21 Would you shed some light on the context of that concept
22 of navigability in terms of the trade and commerce under
23 the treaty?

24 A. Yes. I was deposed on that particular topic by
25 Mr. Helm at my deposition on the Gillespie Dam matter.

1 And also, I believe, Dr. August talked about it as well --
2 or was questioned about it. In my deposition, I was asked
3 questions about whether this -- whether the Treaty of
4 Guadalupe Hidalgo indicated that the Gila River was
5 navigable or non-navigable. And I've since reviewed the
6 treaty rather thoroughly, and I think a couple of things
7 about it. One is you need to place the treaty in the
8 historical context of events that were taking place at the
9 time.

10 MR. HELM: Could I interrupt, Mr. Chairman?
11 I thought cross-examination was supposed to be about
12 something that was either in his report or that he got
13 asked about on direct or that they testified to. And I
14 know I didn't ask him about the Treaty of Guadalupe
15 Hidalgo. I asked the other doctor that was here, so I
16 just think we're going to be here all night, really.

17 MR. SPARKS: First of all, this
18 cross-examination does not follow the strict rules of
19 evidence. It was information that was testified to. It
20 may not have exactly come from this doctor, however, it
21 was placed in play, and this is the only witness I have to
22 straighten it out with, so I would like just to take the
23 last moment to do that.

24 CHAIRMAN EISENHOWER: Go ahead, you may
25 answer that question about the treaty.

1 DR. LITTLEFIELD: I'll try and keep it as
2 brief as I can.

3 The treaty makes it very clear that the
4 knowledge about the Gila River was very uncertain at the
5 time. One of the articles of the treaty mentions that
6 boundary is going to be going -- I believe it's separating
7 the New Mexico territory from some other part. And it
8 indicates that it's going to be run in a certain line.
9 And part of the phrasing in it says "or until it reaches
10 one the branches of the Gila." So there was a fair amount
11 of uncertainty as to what was actually there.

12 I think if you look at some of the other
13 historical documents, particularly in the 1840s, that
14 bracket the treaty, notably the Mormon Battalion, which is
15 the 1846 to 1847 where we've had ample testimony about
16 whether the floating of the wagons indicated navigability
17 or not. If you look at William Emory's comments -- these
18 are all in my report, by the way, beginning at page 106
19 and continuing on for about the next four pages. If you
20 look William Emory's comments, Mr. Emory originally
21 thought that the Gila might be navigable, and in fact,
22 wrote a document expressly stating that. He subsequently
23 changed his mind after serving on the Mexican boundary
24 survey commission. And in his report to Congress stated
25 explicitly that he did not believe it was navigable.

1 When you consider those, plus several others
2 that are in my report, and then you look at the articles
3 dealing with the Gila River as the boundary, it's clear to
4 me that what those articles are saying is that if it
5 should be determined at some point in the future that the
6 Gila is navigable, then both countries will cooperate in
7 allowing their ships to go up and down it and to do the
8 things that are necessary for navigation.

9 But it's not saying it was navigable, it's
10 just saying that if they ever determine it will be
11 navigable or if it ever is navigable, they will cooperate
12 jointly to that end.

13 MR. SPARKS: Thank you.

14 MR. HELM: I have one question I'd like to
15 ask since this was a brand new topic that I didn't know he
16 was going to testify about, if I might. Just one
17 question.

18 (Dr. Littlefield is answering questions.)

19 BY MR. HELM:

20 Q. Doctor, doesn't the fact that the Treaty of
21 Guadalupe Hidalgo -- I know, I work on Guadalupe --
22 mentions navigability indicate that at least to some body
23 of people at least had some thought in the 1840s or '50s
24 that the Gila River was navigable?

25 A. No. It indicates that they thought it might be.

1 And they wanted to cooperate in the event that there was a
2 determination or somebody figured out a way to actually do
3 that.

4 Q. How do you know it was a "might be" thing versus
5 a maybe --

6 MR. HELM: He doesn't have to answer that
7 question. Unless the committee would like him to.

8 MR. MCGINNIS: Is that it?

9 (Dr. Littlefield is answering questions.)

10 BY MR. MCGINNIS:

11 Q. Okay. I have got -- after four hours of cross
12 I've got four areas of redirect, that means I was paying
13 attention once an hour. So we'll be real quick.

14 First of all, there were some questions from
15 Mr. Helm and his partner, or at least comments, that
16 related to the most recent version of the report you
17 filed. Do you recall that?

18 A. Yes.

19 Q. Can you tell me approximately what percentage of
20 the information that is in the new report was in the prior
21 report that you filed with the commission several years
22 ago?

23 A. The raw material information was perhaps
24 95 percent or more of the same material. I did some
25 substantial editing to basically smooth it out and make it

1 more presentable. And with regard to the new material,
2 there were a few places I referenced the surveyors'
3 contract files, which is the correspondence with the
4 surveyor, regarding what his duties were to be, which I
5 had to look into after the original report. And also the
6 photographs are -- I believe most of those are new as
7 well.

8 Q. The second area of questioning is -- relates to I
9 think it was this morning, it might have been a week ago
10 the way this has been, but some questions you had or some
11 things you were asked to read in the surveyor's note
12 relating to -- and I'm paraphrasing here -- things like
13 low banks, deep water, those kind of things, especially
14 the deep water portion. Do you recall that this morning?

15 A. Yes. There were a lot of references to water in
16 river.

17 Q. Do you have any information about whether deep
18 water at one particular point in river or even several
19 particular points in the river relates it to navigability?

20 A. No, and in fact, some of the surveyors indicated,
21 within the same township, that there might be water in one
22 particular location of a certain depth, and then when they
23 surveyed a section line in a different part of the
24 township crossing the river, they might indicate there was
25 substantially less water or possibly even none.

1 Q. There are questions this morning relating to
2 surveyor's notes that seem to question the accuracy of
3 your work or whatever, on the surveyor's notes, and I have
4 one question about that, and that is, have you ever
5 undertaken a project to look at a particular set of
6 surveyor's notes for any river and looked at those notes
7 to determine those notes supported a finding of
8 navigability?

9 A. Yes, I have.

10 Q. And how many of those rivers would you have done?

11 A. I did a study of five rivers in Idaho at the time
12 of Idaho statehood in 1890, the Salmon River and four of
13 its principal tributaries, and in my estimation, those
14 rivers were commercially navigable as of the time of
15 Idaho's statehood -- or navigable.

16 Q. Can you tell the commission in just a very
17 general sense what was different about those notes from
18 the kind of notes you saw on this project?

19 A. The notes -- other than the fact that the date of
20 statehood is different, the notes were done -- as these
21 are, over a wide period of time depending on when the
22 surveyors were present and in different months. But as a
23 general matter, they were virtually identical. Different
24 surveyors of course, but they were virtually identical to
25 these notes except that the surveyors in those cases all

1 consistently meandered all of those streams in every
2 single township.

3 Q. The last area I have is another portion of the
4 survey question this morning dealt with things that --
5 discrepancies or anomalies in the notes or what might be
6 considered discrepancies or anomalies in the notes; based
7 upon your work with these survey notes and that kind of
8 material over how many years you've been doing it, do you
9 have any additional information about why those things
10 might happen? If you don't understand my question, I'll
11 ask it again.

12 A. No, I understand it. As I tried to indicate
13 during my testimony and in quite a few places, I think the
14 real problem with pulling individual cites out of field
15 notes -- of for that matter, other documents -- that
16 particularly in relation to the field notes is you're
17 losing sight of the forest for the trees. You need look
18 at the whole package and see if there is any kind of
19 consistency about what the whole package is saying. And
20 with regard to navigability on the Gila River, the
21 surveyor's notes are overwhelming in their amount of
22 evidence that they illustrate that the surveyors were not
23 treating the river as navigable body of water.

24 MR. MCGINNIS: Thank you, Doctor.

25 CHAIRMAN EISENHOWER: Well, now we have come

1 the end. I want to thank the few diehards that stuck it
2 out. And I do want to say that we are not adjourning this
3 session, we are going into recess and we will reconvene on
4 January the 18th here at 10 o'clock in the morning.
5 Because we have noticed the hearing for the Gila and the
6 Verde, and what we're going to do on January the 18th is
7 take up the Verde River. So that's why we're not
8 adjourning, we are recessing until the 18th.

9 MR. MCGINNIS: Just a point of clarification
10 for those of us who have to do post-hearing memos, is that
11 evidence -- I'm assuming the evidence on the Gila River is
12 now closed, given what you said several times.

13 CHAIRMAN EISENHOWER: The evidence on the
14 Maricopa small and minor watercourses is closed, and we
15 finished that today. And the evidence gathering on the
16 Gila River is now closed also. That's post-hearing
17 memorandums are now --

18 MR. HELM: Subject to post-hearing
19 memorandums that we hang things off of.

20 CHAIRMAN EISENHOWER: Yes. Plus the fact
21 that -- I assume, George, that we will have another little
22 delay until we can get the transcript back from our court
23 reporter. So in other words, you won't have 30 days,
24 you'll probably have 40 days.

25 MR. HELM: What we're looking for is a

1 little adversity because we figured after we got through
2 great contention whether I get 30 days or not. I didn't
3 think we'd pass Thanksgiving and Christmas and New Year's
4 in there and the Salt memorandum due too. So we were kind
5 of hoping from the commission thing that you wouldn't mind
6 if we got them in sometime in the middle of January, like
7 the 15th or 20th?

8 MS. HACHTEL: If I may make a suggestion,
9 for those of us who are doing post-hearing memorandums on
10 each of these watercourses as they're kind of all stacked
11 together, and especially those of us who are kind of
12 one-man bands and don't have the ability to have other
13 people in the office take one or help out, if the
14 commission would consider possibly staggering the dates of
15 the post-hearing memorandums to allow us to focus on one
16 watercourse. And that way I think if you consider that it
17 gives you an opportunity of the best information and legal
18 arguments possible for your consideration as you go
19 through the amount of evidence that you need to -- that
20 you'll be reviewing. And that would be a benefit to those
21 of us who are trying to get the best possible work in
22 front of the commission based on all these things grouped
23 together at the tail end. And I ask for commission's
24 consideration on that.

25 CHAIRMAN EISENHOWER: Let me put it this

1 way, as of right now, we will take that into
2 consideration. We will let you know. But in the
3 meantime, the rules apply, other than the delay to get the
4 transcript, and if we decide collectively, the
5 commissioners, all of us, that that delay is necessary,
6 then we will grant that delay to everybody.

7 COMMISSION COUNSEL JENNINGS: 30 days
8 doesn't commence to run until the transcript is ready.

9 MR. HELM: That's what I was just about to
10 ask, 30 from whenever we get the transcript?

11 CHAIRMAN EISENHOWER: Exactly.

12 EXECUTIVE DIRECTOR MEHNERT: And you'll know
13 that because I'll mail it out to the parties.

14 MR. MCGINNIS: I think under your rules it
15 runs from today.

16 CHAIRMAN EISENHOWER: We're giving you that
17 extension.

18 MR. MCGINNIS: Just so I'm clear, the
19 admission of new evidence is closed as of now?

20 CHAIRMAN EISENHOWER: Or new evidence for
21 the Gila River.

22 (The hearing was recessed at 8:45 p.m.)

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1 STATE OF ARIZONA)

2 COUNTY OF MARICOPA)

3 BE IT KNOWN the foregoing hearing was taken
4 by me pursuant to stipulation of counsel; that I was then
5 and there a Certified Reporter of the State of Arizona,
6 and by virtue thereof authorized to administer an oath;
7 that the witness before testifying was duly sworn by me to
8 testify to the whole truth; that the questions propounded
9 by counsel and the answers of the witness thereto were
10 taken down by me in shorthand and thereafter transcribed
11 into typewriting under my direction; that the foregoing
12 pages are a full, true, and accurate transcript of all
13 proceedings and testimony had and adduced upon the taking
14 of said deposition, all to the best of my skill and
15 ability.

16 I FURTHER CERTIFY that I am in no way
17 related to nor employed by any parties hereto nor am I in
18 any way interested in the outcome hereof.

19 DATED at Phoenix, Arizona, this day
20 of , 2005.

21

22

23 Gerard T. Coash, RMR

24 Certified Reporter #50503

25

