STATE OF CALIFORNIA

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

STATE WATER RESOURCES CONTROL BOARD

Public Hearings to Determine Whether to Adopt Cease and Desist Orders against:	)
Mark and Valla Dunkel, Middle River in San Joaquin County;	)
Yong Pak and Sun Young (Pak/Young), Duck Slough in San Joaquin County;	)
Rudy Mussi, Toni Mussi and Lory C. Mussi Investment LP (Mussi et al.), Middle River in San Joaquin County	)

JOE SERNA JR./CalEPA BUILDING

1001 I STREET

COASTAL HEARING ROOM

SACRAMENTO, CALIFORNIA

VOLUME IV

THURSDAY, JULY 15, 2010

9:02 A.M.

LINDA KAY RIGEL, CSR
CERTIFIED SHORTHAND REPORTER
LICENSE NUMBER 13196

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P R O C E E D I N G S

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CO-HEARING OFFICER BAGGETT: Mr. O'Laughlin, do you have any comments? I assume you read the motion file.

MR. O'LAUGHLIN: I read the motion that's been filed. What date did you want to bump it to?

CO-HEARING OFFICER BAGGETT: I was proposing that if we open it up for a narrow issue that you give -- we will send out a notice with very specific issues and set a time August 2nd, Monday. Does that --

MS. KINCAID: Do you mean to open -- sorry. Hearing Officer Baggett --

CO-HEARING OFFICER BAGGETT: To open Dunkel for the very narrow issue raised by Mr. Herrick.

MS. KINCAID: Hearing Officer Baggett, the Authority would be fine to stipulate to let the information -- any information that Mr. Herrick identifies, certainly the information he identified in his letter yesterday, we would stipulate to let that into the Dunkel matter.

But we don't think that opening the matter up to explain it is necessary. I think in closing briefs in Dunkel we could take care of the issue pretty quickly.

MR. O'LAUGHLIN: I don't agree with that, but looking at --

CO-HEARING OFFICER BAGGETT: Can you talk louder please?

MR. O'LAUGHLIN: I'm sorry.

I have -- on the 2nd and on the 4th, I have two firm matters that have been scheduled for like 30 days that just aren't going to move. Can't move. I'm available the 5th and 6th of August, and I'm available the 10th through the 13th of August.

CO-HEARING OFFICER BAGGETT: Would you concur with the Delta-Mendota position?

MR. O'LAUGHLIN: Yeah, I go along with that, but if John wants time --

CO-HEARING OFFICER BAGGETT: Mr. Herrick?

MR. HERRICK: Are we trying to schedule a time to argue the motion or trying to schedule a time to reopen a hearing?

CO-HEARING OFFICER BAGGETT: To reopen a hearing. No, I'm asking right now if you would argue the motion. They said they would stipulate to --

MR. O'LAUGHLIN: I don't want to argue the motion. If you want to set a date, I have no problem with that.

MR. HERRICK: I think there needs to be a

little bit of discussion here.

Is there an -- I'm not trying to be flippant about this. Is there an argument that the land identified by Mr. Wee as riparian is not riparian? Do we have an issue here? Are we going forward, or are we all stipulating that that land retained riparian right as of sometime in 1911?

MS. KINCAID: We're definitely not stipulating that that land had a riparian right until 1911.

MR. HERRICK: But that's why I want to argue the motion because that's what their witness says. So I'm just asking for them to present their position because I don't know what it is now.

MR. O'LAUGHLIN: Sure.

MR. HERRICK: Seriously.

MR. O'LAUGHLIN: That's fine. I can explain it.

The testimony is that that parcel is not riparian. It is the larger parcel of the 700 acres was contiguous, but we're not going to agree that Dunkel's parcel is riparian.

So -- and we'll explain that.

So I have no problem scheduling another date. I did not oppose the motion. So if we want to schedule a date, that's fine with me.

CO-HEARING OFFICER BAGGETT: Mr. Herrick, is that --

MR. HERRICK: We should schedule a date, and we're reopening it for the purpose of bringing in evidence of the riparian rights of the Dunkel property, I take it.

MS. KINCAID: And I'd like to focus in on that.

Are we reopening just for the matter brought up by Mr. Herrick, or are we blasting open the doors here and letting all riparian issues in?

I think there's a distinct difference, and I would certainly argue that if Mr. Herrick has any other issues he wants to put on the table, that's fine. But to reopen the Dunkel matter in totality just based on this one narrow issue is not right.

CO-HEARING OFFICER BAGGETT: That was not his proposal, as I understand it, and --

MR. HERRICK: I think counsel is confusing facts with issues.

If the issue is riparian rights of the Dunkel land, then there is a lot of stuff that could be discussed. But if counsel is suggesting that the only thing that will be argued is Mr. Wee's second testimony, then that's not what I'm looking for.

MR. O'LAUGHLIN: Absolutely not. I would

expect Mr. Herrick to put in some type of riparian case for Mr. Dunkel. I'm fine with that. So -- but it's -- I don't see where it would be exhaustive.

CO-HEARING OFFICER BAGGETT: Prosecution, do you have comments?

MR. ROSE: Yeah, I'm just not sure exactly -- it seems as though both far-apart positions have been proposed, and I want to make sure that if I need to weigh in I do so, that you had already ruled that this hearing would only be held open for specific information taken in the Woods.

And this certainly -- the issues with the motion do raise an additional issue, but I would suggest that we only look at riparian -- preserved riparian rights through the severance of each particular parcel and not going through all the other issues that might recur again --

CO-HEARING OFFICER BAGGETT: Correct.

MR. ROSE: -- like Delta pool and all these other issues.

So I would suggest, if it's okay with the parties, that we just look at as the parcel became the size and shape and location that it is today whether or not riparian rights were retained.

CO-HEARING OFFICER BAGGETT: That's my

understanding of Mr. Herrick's motion. Is that correct?

MR. HERRICK: I moved to reopen the hearing, and now we're discussing the specifics of that. I didn't limit my reopening.

We certainly believe that issues such as Delta pool or any riparian argument would be or could be presented. I don't -- I don't -- it's a difficult position. The prosecution was: Show us, you know, a right. They agreed with the Wood --

(Interruption; building management announcement)

CO-HEARING OFFICER BAGGETT: Mr. Herrick.

MR. HERRICK: Anyway, the case prepared was to address the Woods Irrigation right that was brought into dispute, so we want to be able to prove this person's riparian right.

I don't understand why we would limit that so that we might be able to get this guy out of business. I just don't understand that.

CO-HEARING OFFICER BAGGETT: Let's --

MR. O'LAUGHLIN: I don't disagree with what John just said, from the standpoint -- I know this sounds kind of strange -- but from the standpoint that all this testimony is all the testimony that basically we've seen in all these hearings, and the State Board is

going to have all this testimony in front of it anyway. I mean -- I don't know.

I just can't get too fired up. If he wants to put Lajoie and Neudeck and all these other people on again -- I mean, we've already seen them. I'd just as soon we figure out some way --

CO-HEARING OFFICER BAGGETT: We'll --

MR. O'LAUGHLIN: -- we get all that stipulated in.

I want to get to the nub of the matter which is: Based on the severances, what is the point?

And John can preserve all the other Delta pool arguments and the streams and all that stuff. I don't have a problem with that. But I just don't want to sit here for an entire day listening to that stuff again.

MS. KINCAID: And in addition to Mr. O'Laughlin's comments, if we're going to open up all riparian matters in the Dunkel -- or all riparian issues in the Dunkel matter, I would like to talk a little bit about the procedure and how that's going to work.

You know, we've already done this once and put in direct evidence and testimony so everyone can be prepared. If we're going to open that up again, I think we need to address whether people are going to have to re-serve new evidence and testimony that's not rebuttal

so the parties can review it, be prepared and -- I mean if we're going to redo the whole thing, there's going to need to be procedure, I think.

CO-HEARING OFFICER BAGGETT: Mr. Herrick?

MR. HERRICK: I don't have a preference there. If you want stuff ahead of time, we can do it ahead of time.

I do not anticipate a riparian presentation on behalf of Dunkel would be an all-day thing on my part. I'm not talking about putting on four or five, six witnesses to talk for three hours.

CO-HEARING OFFICER BAGGETT: That was my understanding from your motion, was that it was on a fairly narrow issue of inconsistent riparian testimony and severance, and not any of those other issues.

So let's find a date, and we'll send out a notice and would ask the parties to the extent it's testimony that's already been heard on these other matters, like the Delta pool theory and some of those issues. We've already got that in the record, and I think you understand that, Mr. Herrick.

We don't need to hear all that testimony from Mr. Mr. Nomellini again. It's interesting, but we've now heard it. That's not going to change.

Try to limit it to the specific issues of this

specific parcel and severance. Is that acceptable?

MR. HERRICK: Yes.

CO-HEARING OFFICER BAGGETT: Very good.

MR. HERRICK: For my part, the 10th, 12th, and 13th are the best dates.

CO-HEARING OFFICER BAGGETT: I'm -- my dad's 90th birthday party. Long away from here.

(Discussion off the record)

CO-HEARING OFFICER BAGGETT: We're back for rebuttal testimony. And as I recall, the prosecution asked to go last.

MR. ROSE: That's correct.

CO-HEARING OFFICER BAGGETT: Who wants to go first? Mr. Herrick? You ready? Okay. Proceed.

MR. HERRICK: Thank you. John Herrick for Mussi and for Pak and Young. Mr. Nomellini is going to present rebuttal evidence.

The evidence he is presenting will be for both the Mussi and the Pak and Young hearing, and then we'll move on to the other panel members. They're sitting here because we're starting and Dante will proceed for a little bit. Thank you.

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DANTE JOHN NOMELLINI

Called on rebuttal by RUDY MUSSI, TONI MUSSI AND LORY C. MUSSI INVESTMENT LP; YONG PAK AND SUN YOUNG

DIRECT EXAMINATION BY MR. HERRICK

MR. NOMELLINI: I'm Dante John Nomellini. I've been sworn.

And I'd like to start first of all focusing in on the tide gates and Duck Slough. And there was extensive testimony about the tide gates being used only for drainage. There was testimony about whether or not Duck Slough extended inland, how far, and what its sizing is.

I'd like to start first with Exhibit 19. I apologize for being a little out of order, but my lack of ability to organize reflects itself in these exhibits.

Let's go to the second page. This is an illustration from the History of San Joaquin County by Thompson & West, 1879. I think we put the whole thing in as an exhibit somewhere; but if we didn't, we'll produce it. I referred to it before.

Rather than draw on butcher paper, I wanted to use this as an illustration, and what I want to show

here, as I understand it, this is not Roberts Island. It's probably farther up in the Delta but in the rim, maybe even in the Mokelumne River area where it came into the Delta.

But what I attempted to show here by grabbing this illustration is tide gates made out of wood which are reflected in here. And then there's an embankment that looks like a levee that runs along those.

And it's important to realize that in the early stages of reclamation the relief in the terrain was much less than later years because of oxidation of the peats and burning of the tules and the soil which created more relief.

So the tide gates here are shown in the top illustration. There are three of them. They are wooden, and they have a flap, what appears to be a flap gate I think on the downstream side which would be typical of a drainage situation as well as being able to tie those up to bring water back in.

In the background is a stack, smoke, probably a steamer going down the river, so I think this is looking somewhat to the west. There's kind of the mass of sailboats in the crease of the page.

This other structure that's up to the left in the top illustration appears to me to be another

structure that may be more oriented to control for irrigation since the structure appears to have mechanisms on the other side that could be a gate structure.

All right. I'd like to go next to Exhibit 3. These are all rebuttal exhibits. I labeled them DJN-R Exhibit 3.

This is an article. I think it was presented by Mr. Wee in his testimony. The blow-up on the last page, the blow-up is just the blow-up of the earlier pages.

It talks about a group of people being invited to inspect work on Roberts Island. And they talk about stepping on board the steamer Clara Crow:

> -- which has been recently purchased by Mr. Whitney and fitted up in elegant style and in a few hours were landed at Camp 2 Duck Slough near the center of the island passing on the way several miles of levee already completed.
>
> Here we took horses and rode along the work, crossing the island to the further side of Middle River, passing camp numbers 3 and 4 along the whole distance some four miles with lined continuous

busy stream with teams and men piling up rich alluvial soil into the levee.

Mr. Wee interprets this to mean that the steamer stopped at Burns Cutoff near the mouth of Duck Slough.

It is my view, and I will show you further why, that the steamer went inland approximately two miles along a substantial Duck Slough to what I think we can characterize as Honker Mound.

The next article I'd like to call your attention to is in Exhibit 4.

And this article was cited by Mr. Wee for the proposition that Duck Slough was completely blocked off and two self-actuating floodgates were installed.

I don't take issue with the two self-acting floodgates being installed. I'm not sure based on everything I've seen that this was a complete closure of Duck Slough.

But even if it was, I believe that the floodgates were initially used for drainage then subsequently used to help irrigate the drained land.

I just wanted to get those two articles in front of you first.

All right. I'd like to go to Exhibit 20.

Exhibit 20 was prepared by me. I attempted to

do it on a topographic map taken from Google. I think -- I don't know the date of the topographic map, but it's a fairly modern one.

What I did here is I drew a line reflecting two miles from what appears to be the mouth of Duck Creek or at least where High Ridge Levee today intersects Burns Cutoff.

So I just drew an arc. And what I did in the field, I went out with my pickup and my odometer and started at Highway 4, and I drove on the windy Inland Drive all the way over to the intake of the Woods Vasquez Robinson pump station. That was 4.2 miles from Highway 4.

And if you look at the -- let's go to Exhibit 5. Again, this is an exhibit that Mr. Wee put in.

If you look at the page, I added the red marks. That wasn't Mr. Wee's add. But it talks about four miles of the crop levee -- I think that's just a typo and it's the Cross Levee -- on Honker Ridge from Middle River to Honker Mound.

So four miles from the Woods Robinson Vasquez pump would put you at the end of the dark line that I put on Exhibit 20 which kind of coincides with the two miles from Burns Cutoff.

Now, this route may have been on the Honker Ridge Levee farther to the west, but it still puts it somewhere around Highway 4, the Highway 4 intersection with Inland Drive.

But this explains that four miles of the Cross Levee on Honker Ridge from Middle River to Honker Mound at the head of Duck Slough.

So this person, Mr. Tucker, said that was the head of a Duck Slough that he was talking about.

But it was two miles inland. And he talks about this four miles was completed before the flood came. The average height of the levee was six feet, slopes 2-to-1, crown 4 feet wide, and the two miles along Duck Slough from Honker Mound to Burns Cutoff was located and construction well started when the flood came.

So I think that the Honker Mound location and the head of Duck Slough, at least in the mind of Mr. Tucker -- and of course it's our contention the slough ran all the way over to Middle River -- but it's at least two miles inland.

And in my opinion the article that talked about the steamer talked about the steamer going up to that point, and then they rode their horses for the four miles to reservoir.

So I think it's clear that at least at that time there was a substantial Duck Slough running up to Honker Mound.

All right. My next exhibit I'd like to call your attention to is Exhibit 6.

And I had staff search for records, and in the general search, this came up. I believe it's in the Bancroft Library at Berkeley. And I just wanted to kind of establish -- let's go to page 10 of that if we can.

What I wanted to try and bring to you, I brought quotes from Settlement Geography of the Delta in my direction presentation about how tide gates were used both for drainage and irrigation, and this is just an additional evidence of the general understanding of that.

And this is a report by A.C. Peachey, Esquire president of the Tideland Reclamation Company. And on page 10, they say:

> The sloughs which intersect these lands --

And they're talking about lands a little bit farther out in the Delta, where Tideland Reclamation was working, but I think it applies here:

> The sloughs which intersect these lands, instead of being objectionable as they

are popularly regarded, are of positive benefit because they afford natural drainage. By damming them at their mouths and putting in drainage gates, we are able to convert the channels by which the land was formerly overflowed in the channels by which it can be drained --

This is not controverted. Of course this is consistent with Mr. Wee's testimony.

-- thereby making drainage so far as they are concerned natural instead of artificial and thus greatly reducing its cost.

Now it also says:

The lands of your company, being between high and low water of the tide, the facilities for irrigation when the land is reclaimed will be as nearly perfect as it is possible to make them because irrigation can then be effected without cost by merely opening the drainage gates and letting the flood tide into the drainage ditches exactly to the height that may be wanted and then closing them.

It's my position based on everything I've

studied and my own work on reclaimed land in the area of the Trapper Slough and Whiskey Slough that it's well understood that these gates are used for both drainage and irrigation.

And when you drained the land, of course then you have to worry about having proper water application in order to properly grow the crops.

The land is not level, you know, at these early stages. It's got low spots that are probably wet and high spots that become dry. So you try and drain the low spots, and when you do it makes it important to apply water to the high land.

So I take issue with Mr. Wee's conclusion that those tide gates in Burns Cutoff were used exclusively for drainage.

I think it's very clear from the practices, you know, in the Delta that they were used for both drainage and irrigation.

Okay. I'd like to go to Exhibit 16. 16 and 17 are both attempts to give you everything we could find about this particular exhibit.

I sent two waves of helpers over to the Archives to try and follow up on this, and there's a big map over there that they had to lay out on the table and take pictures of it, and that's Exhibit 17. I tried to

give you the whole thing.

This is part of the Hammond Hall paper collection. And if you look at the second page of 16, they denote this with a number 5290-18. And the explanation they give should be in here, about four pages in.

It calls Grand Island and Suisun Bay to Foothills and first standard north, ca 1880s.

So the best date we get out of the archive people that it's in the 1880s, it's part of the collection supporting the Hammond Hall map that Mr. Wee cited.

If you go back to the first page, 16, you'll remember that the testimony of Mr. Wee was that because the words Duck Slough -- because the words Duck Slough were up to the right near Burns Cutoff that it only delineated a segment of this line as Duck Slough.

And the reason we think this is important is that of course this map delineates the whole line as Duck Slough running on down, and we merely present that to support our view and further evidence that Duck Slough ran farther down to the south and, we believe, all the way to Middle River.

So just by arguing about where the words are placed I think this clearly refutes that. This was one

of the base maps they used to put together.

Every mapper, of course, has a different view of what they want to emphasize and so on and so forth. The purpose of this is to give you the rest of the story as we see it.

All right. I'd like to go to Exhibit 18.

Exhibit 18 is a June 20th, 1877 deed from Fisher to Glasgow, Glasgow Californian Land Company, Limited.

This is all of the area of concern here that is west of what I'll call Duck Slough slash High Ridge Levee, whatever. I don't know that we should argue about what we call this delineation point.

But that alluvial deposit could not occur in this area unless there was a major stream running through it.

Now, when that stream was filled -- and how deep it was or whatever, we can argue about -- but that soil, that alluvial soil which flows over the banks, the natural banks of the stream, could not have gotten there, based on my understanding of the geology and history of the area, without a major stream running through there. And we've given you testimony on that subject.

So there was a stream through there, and we've

called it Duck Slough. Maybe it should be extension of Duck Slough or call it some other slough.

But the term "high ridge" I think has to be understood in the context of what kind of a ridge it was.

In my view, it's somebody that's saying, hey, I walked out through the swamp out there, and I ran into some high ground, and then I kept walking and I fell in the slough, then I crawled out the other side, and there was a higher piece of land.

If you go out there, and I know I've asked -- we've asked that you go look, there's portions of this High Ridge Levee that are part of the flood control system of Lower Roberts which I've represented for years, and it will not even hold out a good high tide.

We didn't tamper with it. We've been raising parts of it because we're trying to get it up to take, you know, a flood tide. But it's not a high priority because it's an interior levee.

But it is not a high ridge in terms of high levee or anything like that. It's a high spot out in the swamp. And this swamp had higher land along the levees -- which everybody's kind of said the overflow, the history's clear, the alluvial particles settle out and then it goes back down into the lower swampland

which was more organic which went away.

This deed is important in my opinion because it commits Mr. Fisher for a five-year period -- if you go on in the document, it contains an agreement where he agrees for a five-year period, and this is 1877 so we're right there. This thing is not a stable, dry environment at this time.

Mr. Fisher is committed for five years to install levees, dams, sluiceways, and take this 30,000 acres and make sure that 25,000 acres of it is ready for seeding. They probably were seeding some kind of grain crop initially or whatever.

But these people were focused on trying to get farm production out of this, not only keeping the flood waters off and reclaiming the land but watering the crops. And I see the term sluiceways in addition to the dams as an indication that they were going to use these floodgates for both purposes.

So I wanted to call your attention to that. I think that written agreement that's attached to the deed kind of sets the tone for what we've been trying to present to you people and that this whole thing of reclamation of the swamp is one of trying to farm production out of it which involves, once you drain it to some degree, then you have to figure out how to

irrigate it.

The Settlement Geography of the Delta and the History of the Delta cited in my direct testimony pointed out the alluvial soils, being the higher areas, were the subject of use of pumps to irrigate those after or starting in the 1870s. We believe that is the case.

All right. Let's go to Exhibit 7.

What I tried to do here was we had given you in the Woods case, you know, some of these photographs, and I just wanted to bring those forward to you.

7 shows the locations of the photographs that are in Exhibit 8, and I'll just briefly and quickly go through those. You've seen them before. I just want to make sure they're in the record here.

Exhibit WIC-8I, which is photo 7, is just that brick floodworks in the, I'll say, westerly canal of the Woods Irrigation Company.

Photo 8I or photo 8, which is WIC Exhibit 8I, it shows a control gate between the east channel and the west channel at Woods intake.

And again, these are brick structures with plaster on the outside which in my experience would reflect construction prior to the 1900s. And the reason I say that is the property that I live on and I own has a kiln on it which is not too far from here on Roberts

Island, and whoever built the stack on it put 1893 on it.

And it was one of two brick production locations on Middle Roberts Island, and these would be the materials that would become available in the immediate vicinity starting in 1893. So they would use those materials, and prior to that time I think we saw at least in that illustration wooden floodgates.

And we have run into -- or I've run into in my work on levees with these wooden floodgates that are old time deals, they're huge problems for us from flood control because they deteriorate and create an opportunity for a blow-out of the levee due to seepage.

So the later ones were brick. Then following the brick came concrete. And you can see in these photographs that there have been additions on these flood control structure -- floodgates, I should say, that added, it looks like, reinforced concrete or concrete on the end of it so they can put a new gate like metal gate to control the flow.

And that's what I hope to give you with these photos is to give you what we contend and what we see in these structures.

WIC Exhibit 8I which is photo 10 is a lousy photograph, but that's what I took. And that shows the

gate from the waterside on the east tunnel structure of the main Woods Irrigation facility. And that tunnel structure, as we understand it, was filled with concrete.

We dabbled over there in an attempt to dig, but there's pipes all around so we haven't done it. If you really wanted us to dig, I guess we could take the pipes out and dig underneath it, but we think it's pretty clear from the photo that the structure is still there.

8I is again the waterside photo 11 of the other Woods structure. And it's hard to see, but if you look in the middle of the photograph, you'll see the top of what appears to be a gate structure. We call it a floodgate.

Photo 12. This is a brick headworks. And again, the Exhibit 7 shows you the location of these. This is a little bit upstream on Middle River from the Woods intake. And this appears to be the headwall of a floodgate at that location as well.

Exhibit 8I, which is photo 13 -- and I'll talk about this a little more. This is a floodgate on the Pocket Area. And it runs in an -- it's there today. You can see it. You can see the brick. Somebody added the concrete to make this newer modern gate work on the end of it.

But that runs directly up to the Duck Slough, High Ridge Levee location to the -- I guess it's south of the Mussi Vasquez property.

And we've been looking for a floodgate at the Woods Robinson Vasquez location. It looks like there was one there. We have not been able to locate, you know, tangible evidence that it was there. We can't get underneath the pipes without disabling the station.

But this is a little bit downstream, and I'll show you more about that in additional exhibits.

Photo 14 is the land side of another floodgate in the Pocket Area also that could have served water to this same area that we're talking about with the Mussi Vasquez property.

And again, this is a brick structure covered with mortar, and you can see an end wall on the waterside at that location.

Photo 15 is a lousy photograph, and I have a better one for you in another exhibit. But this shows a floodgate a little farther to the west than the previous one that runs into the Pocket Area, again could go up to this area that we're talking about with the Woods Robinson Vasquez issue.

We do have evidence, however, that this gate or if there -- if a new gate went in in 1923, there may

have been a gate there before. Anyway, we wanted you to have that evidence.

Photo 16, which is 8I, this is the Stark Road pump station for Woods. It appears that this was added onto a floodgate at this structure, but we didn't make any excavation here. It's in the middle of a county road. So we tried to avoid a major disturbance.

All right. Let's go to 13 if we can.

13, 14, and 15 -- I'll try and just give you the detail on this one map. The blow-ups are a little easier to read. So if we go to 14. We wanted you to have the whole thing.

We found this map in the records of San Joaquin County Public Works Department. It purports to be a map of property of Mary A. Nelson in San Joaquin County showing location of proposed floodgate and canal.

So that poor photograph I gave you could be this proposed floodgate which is mapped here in 1923, and it shows a wiggly line.

I knew Charlie Widdows. I had him do my property surveys before he died. But he followed by straightening out a little bit of natural contour here to the north. And all I want to do is point out there were sloughs all through this area.

In my opinion, everything that was a wiggly

line was following a slough of some kind. People have described it as serpentine or whatever.

But anyway, that followed a slough. That was a floodgate, and it proposes a lift pump. We're informed that that lift pump was driven by an old best fuel-powered engine. We could not find the remains. We were told that it was taken out and salvaged.

But more importantly, if you look off to the right, it shows a present floodgate. That is that gate that I showed you that had the brick and then the cement on the front. And that is the exact location of -- again, I'm going to give you a better photograph.

This is WIC Exhibit 8I, or photo 13 of this exhibit.

That gate obviously was in place. We think it was in there prior to 1900. And it could have delivered water to the High Ridge/Duck Slough wiggly line. Okay.

Let me give you some more photos to wear you out. I wanted you to have them because we had no agreement on you going to the field.

If we look at Exhibit 1. I went over onto Union Island in the area of the Woods Robinson Vasquez intake. If you look at -- if you look at Exhibit 1H -- or better yet even Exhibit 1I, the last page.

On the right-hand side of that photo -- and

again, that's just a Google photo, satellite photo. I just pulled it up off of Google. That ditch that runs to I'll say the north is what feeds the Woods Robinson Vasquez pump station today. And you've had evidence indicating that that was improved in 1925.

Over on the Union Island side, you can see I've marked these irrigation structures, and I'll show you the photos, Exhibit 1 and 1A show a headwall, and now a pump structure going through the headwall which it looks like -- if you look at 1A, there's possibility of a floodgate at that location, although we can't see for sure. You know, the floodgates are down low, and we can't see for sure.

But if you go a little bit downstream to Exhibit 1B and look at that photo, there's clearly a headwall that was added on a floodgate. And you can see there is a piece of plywood that slid down in this concrete floodgate structure.

And of course the floodgate is no longer being used, but there's probably concrete or something like that that filled the floodgate behind it. So there is a floodgate not far from the Woods Robinson Vasquez intake.

And let's go back to Exhibit 1 H. It's a little bigger area. But to the right above the word --

above the E in DJN-R EX 1 and 1A is the Woods Robinson Vasquez pump intake. The floodgate at Exhibit 1E -- and there's two pins there. There's one -- the second pin, I took a picture of a large slough on Union Island that's fed by that structure.

Let's see here. 1B is kind of covered up there.

But anyway, that floodgate I talked about that was shown as being present in the Charlie Widdows proposed pump for Mrs. Nelson is right under the D for Exhibit 1C -- 1D.

And that's that straight line that runs over to the Duck Slough/High Ridge location which is south of the Woods Robinson Vasquez. In fact, that farmstead that you see there is the Robinson -- I'll call it the Robinson home place.

The point of this is that we presented to you with other witnesses that natural sloughs that ran through Union Island came over in the same general area. And these sloughs that ran on this alluvial soil didn't stay in one location. They meandered.

So we think this helps show you that these areas on both sides of the reservoir which are similar elevations were served by floodgates at the early stages and were major irrigation facilities and how

geologically these sloughs ran, Middle River versus these sloughs that come across Union Island -- I don't know for sure -- but it's clear that there are these windy paths that follow a slough of some type.

Whether they broke out of some other kind of a tragic event or whatever, I don't know. Anyway, there are floodgates there.

Now, if you go west on Exhibit 1H, we located for you -- well, first let's hit Exhibit 1C and 1D. This is a major structure.

1C and 1D. And again, if you went and looked, you'd get a real feel for -- the brick structure is there. 1C. And my photographic prowess is not the best, but it's pretty clear that that old brick floodgate was there, still there, and it ran all the way down.

And we think that's in the general vicinity that we're talking about, and there's further evidence that there were -- the general practice was to put these floodgates of some type in these various sloughs.

1D is another photograph. I don't know whose arm that is. Maybe that was Herrick's. He was with me. Probably is. 1D shows that brick headwall for the floodgate.

And then, 1E is out of order. I apologize for

it. 1E goes back over to the east. It is shown on Exhibit 11. That's a major slough over there. It's windy. It's a major size. And it looks to me clearly based on my experience that that was a natural channel.

Now we tried to find for you a centrifugal pump. And on Union Island, Exhibit 1F, we found in the berry bushes the relic centrifugal pump that we think was probably driven with a belt off a steam engine or later a fuel-driven engine.

Because they had steam power in use in the 1870s, and there are illustrations that show in the History of San Joaquin County, if you look at them, they show these steam engines with long belts going, the thrashers. They took a pulley and a heavy canvas belt. So we think they drove these pumps with the same thing.

Anyway, that's there. You can look at it. You can analyze it. Whatever. But it's still in place. And it's in a floodgate that looks to me like they ought to take it out.

But concrete was added to the floodgate. It goes down quite deep. And if you look at 1G, it goes right down to the waterline. And again, it's there for you to see if you have any doubts about it.

Okay. Photo 2 group. Exhibit 2 is another set I wanted you to have. Some are a little better

photographs. One of them is -- all right. Yeah. Okay.

Exhibit 2 is a better photograph. I took it -- instead of with my cell phone, I took it with a camera of that headgate that says present headgate in the Widdows plan that runs off to the straight one.

This you can see a little better. How it picked up more light than my phone, I don't know. But it did, and you can see it.

Exhibit 2A is that same floodgate that I think is the floodgate that Widdows proposed to Mrs. Nelson and put in. And the structure you can see a little better. It looks like concrete. I thought it might be concrete over wood.

We didn't want to tear this whole countryside up without putting the levee back together, so we did not tear it up. There may or may not be an ancient floodgate beneath it.

I would speculate that because Widdows said proposed and didn't say present floodgate that was a newer floodgate that went in in 1923.

Just to give you an idea what they did there, though, they put a pump on the right side. They had the floodgate that operated underneath, and this old pump used to go through that headwall on top and supplement the floodgate operation.

The current pump station -- okay. Pardon me? Oh. This is Exhibit 2B. We're looking at 2A.

2B, that's the pipe that we think was hooked to the pump that went over here that supplemented the floodgate.

To the left is the current flood station. It has a turbine pump and a separate line that goes through the levee, and it's driven by electricity.

Exhibit 2C is one I should have given you before. This is an old centrifugal pump converted to electrical power just upstream from the Woods main intake between that brick headwall that I showed you previously and the Woods facility.

And it reflects what we believe were the centrifugal, old centrifugal pumps that were in there in the early stages, certainly prior to 1911 or thereabouts.

We think electricity came into the area in the early 1900s. So these things were not powered with electricity until later.

All right. Let's see what I missed here.

9, 10, and 11, and 12 are simply the Atwater maps for both the Holt Quadrangle and the Stockton West. They were referred to in my testimony before. I'm not sure they were introduced in this hearing.

But they were prepared by a Brian Atwater with the US Geological Survey. And in those maps -- these are the legends as I interpret them -- he shows historic sloughs trying to go back to 1850 and also shows the waterline under low flow conditions which means no river flow, basically tidal, existing as of 1850 which I know you don't want to hear, and I'm not going to give it to you again, about the Delta pool aspect and the proximity of those lines to the properties in question.

I'll just say all these properties we're talking about contacted that line, and therefore in my opinion are clearly riparian to the Delta pool as well.

So I wanted to give those to you so you have them. They may be in the record. It may be redundant. But I wanted to make sure we got them to you.

Exhibit No. 21 is the Hendersen Billwiller map dated 1914. I think it's already in the record, but I wasn't sure.

The blow-up of it is Exhibit 22. And in my opinion, it shows not only the main intake at the -- kind of the bottom, just a little to the left of center, the main intakes for Woods Irrigation Company, but it also shows -- the dashed line under the legend is hard to read. But it's irrigation canal, I believe.

And it shows the dashed line running off to the

north, to the west of the main Woods plant. And that's where I showed you the photograph of that westerly intake for the Woods Irrigation system.

And if you follow these, you'll see interconnections not only on this exhibit but on some of the other exhibits where all of these systems were interconnected, the drainage, the irrigation system.

And at those early stages, they were extensively used in my opinion for both irrigation and drainage.

In later years, like today, because we have some very low lands, because we've had more oxidation of peat and we have more divergent ownership, we tend to use drains as drains and irrigation systems as irrigation systems.

And the interchangeability of the two is less popular because somebody would want to keep their land dry while the other guy wants to keep it wet, and if you are near each other, you can't do it. You sub over to the other guy. You put the water -- raise the water in the drain. It subs into their land or affects their farming.

So today we have less. Not totally without it. We still use drains where we have common ownerships or common crops, it's common practice to use the drains for

both irrigation and drainage.

But back at this time, I think it was clearly less differential in the soils and greater opportunity to do that.

All right. My last exhibits, 23 and 24. These are not on slides. I'll give it to you in an electronic format. But I think everybody's used these aerial photos.

These are the 1937 aerials that we were able to obtain. Whether this is the high resolution set or the low resolution set, I can't tell you. But we've made them available to the Prosecution Team and to the water -- other water right holders.

And all I'd like you to do is look at this and see the reflection of the various sloughs that run through this area.

If we look at AB D 37-27, which is Exhibit 23, in the top center of that photograph is where the -- I'll call it High Ridge Levee, but I'm going to put quotes around "high" -- connection to Burns Cutoff.

That is the exact area that I testified to that is very modestly high. It's low. We don't think it will even hold the high tide that my district, RD 684 has been trying to improve.

We've improved the southerly half up to the

railroad embankment, but the other part running northerly to Burns Cutoff is still in the same elevation state as probably existed.

And you can see that -- just take a look at it and compare it to the levee height on Burns Cutoff, and you'll know it's not a major flood levee.

Now, the other important feature here as you can see, as these sloughs go over to the north and intersect Burns Cutoff, you can see there isn't just one slough going through there to Burns Cutoff. There are a whole bunch of them.

And whether or not the dam that Mr. Wee talked about with the two floodgates entirely cut it off at that time, I don't know.

There's some evidence to show there was still a Duck Slough opening that was closed way later. When? I don't know.

But this line running off, kind of a straight line going off to the north, east is the main drain for the Woods Irrigation Company. And there's a pumping plant there at the intersection with Burns Cutoff.

More importantly is to note that the railroad cut across here. Railroad went in about 1898. The railroad did not block off Duck Slough.

There's a trestle that's still in there today

where the Woods Irrigation canal crosses, and the natural routing of the sloughs that used to go through here now intersect the railroad borrow pit on both the east and the west and flow together through the trestle to the Woods Irrigation Company drainage pumping plant.

And in our view, there was never any disconnect or severance of the water connection. When the railroad went through, the connection was just artificially adjusted in terms of location but was never cut off.

The mound that I talked about, Honker Mound, if you look at Exhibit 23 over on the left-hand side and about just below the middle, there's a line paralleling the railroad. The railroad is kind of a little bit above the center. This other line is where Highway 4 is today. And that's where I started my odometer reading for the 4.2 miles to go along that windy way.

So I believe Honker Mound is probably in that location where you see a farmstead in that left-hand side, probably the lower left-hand quadrant of Exhibit 23.

Exhibit 24 is just giving you the rest of that aerial run that comes down to the Vasquez Robinson area. The Mussi Vasquez property is kind of that funny shaped one, kind of in the lower left-hand quadrant.

The straight line running over to it is that

Kingston School connection that we talked about.

To the left of the Kingston School site, you can see in 1937 the remnant of the slough that went along the -- I'll call it the Honker Lake or westerly levee of the Pocket Area.

Clear to me that this slough went all the way up, connected to Whiskey Slough.

We heard testimony from Mr. Wee in response to a question that Trapper Slough and Whiskey Slough weren't there in this area because Lower Jones Tract and Upper Jones Tract weren't yet reclaimed.

If they weren't reclaimed, the water body that was adjacent there was swampland. Whether you want to call it Trapper Slough or Whiskey Slough or whatever, it was a water body connected to Trapper Slough and Whiskey Slough.

So it makes no difference in my opinion that he's making this narrow argument that it wasn't a slough.

Now in the upper left-hand corner of this photograph is the area that I bought an interest in and farmed. It's the dark area there. It looks like a waterway.

But it was that late reclamation of tule marsh that my father's company and Donald Woods -- I don't

know if he was related to the Woods family or not, but I bought his interest. He had a one-third interest.

But there was a slough that went along what we would call the Honker Lake Levee. And whenever they built a pile of dirt like a levee, there's a borrow pit. So it defines the marsh into a waterway.

And there was no absence in my opinion of hydraulic connection there. These people were fighting floods. High Ridge Levee, whatever it was, certainly was a levee intended to protect against flooding from the west.

It wasn't high enough to stop flood waters coming from the east flooding out the lower land because there is a gradient that comes down from the upper portion of Upper Roberts that you can't hold.

What we're trying to do today is simply relieve it, hold it long enough to get it back in the river.

So these guys were trying to keep from being flooded from Honker Lake.

The evidence is clear that in 1893, and that's when the Woods brothers almost went broke, there was a major flood that flooded Middle Roberts, Honker Lake, and I put into the record that the restoration of the Honker Lake didn't come about until about 1903.

So we were dealing with swamp interfacing in

here during this part we're arguing as if we were there today. You know. With just dry land and arguing about these waterways not touching the land and so on and so forth.

Okay. That's it. I appreciate your time and patience with my presentation. I wanted to make sure you had this in the record so I feel better when I wake up in the middle of the night and know that I've given it to you.

CO-HEARING OFFICER HOPPIN: You decided not to include the authentic sketch from the 1800s of the willow plant chasing the farmer down the levee for his canteen, I assume?

MR. NOMELLINI: I was going to spare that. But willow, as you know I'm sure, have a propensity to move to fresh water. And that -- you would know it. I don't know if the others do.

But I've had them go through sewer pipes and go through roof drains at my house, so I have first-hand knowledge of that.

CO-HEARING OFFICER HOPPIN: I was just reflecting on a comment that you made.

MR. NOMELLINI: Perhaps it wasn't necessary. All right. Thank you.

MR. HERRICK: Next, Mr. Moore. I'll pass out

his stuff right now. It's already been collated.

CO-HEARING OFFICER BAGGETT: Okay.

--o0o--

DONALD W. MOORE

Called on rebuttal by RUDY MUSSI, TONI MUSSI AND LORY C. MUSSI INVESTMENT LP; YONG PAK AND SUN YOUNG

DIRECT EXAMINATION BY MR. HERRICK

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MR. HERRICK: John Herrick once again for Mussi and Pak and Young.

Mr. Moore's testimony is all identified by Mussi exhibit numbers, but again we intend that to be in both proceedings because it's the same testimony.

Mr. Moore was asked to try to explain or reach agreement on the fact that different maps from different eras show different features, and so we'll go through that.

I will be asking Mr. Moore more questions -- again, we put this together as best we could -- than Dante's soliloquy, so.

Mr. Moore, you've taken the oath. I guess it was over a month ago now.

MR. MOORE: Yes, I have taken the oath.

MR. HERRICK: Mr. Moore, we're going to start

with Exhibit R-20, Mussi R-20. And if you could briefly explain the two maps you have attached there and what the purpose of them is.

MR. MOORE: Yes. Two maps where 2009 photos from the agricultural -- okay. Got to chew on this.

These are 2009 aerial photos from the agricultural department that helped explain the situations and helps identify the water situations that we have on Roberts Island.

This is Sherman Island. The city you see there is Antioch. What this shows, if we're looking right in this area here, is pretty much what Roberts Island, the Duck Slough area, the area in general, that all the testimony is addressing, this is approximately what this would have looked like probably before 1850.

We can see waterways going through there. We can see many tributaries to those waterways. And it's obvious from this location being very similar to Roberts Island where the elevation is probably zero to 5 feet, you can see why levees would have obviously been built, how tides would have affected the water, and how all these different issues of tidal flow, levee, water protection, flooding and all are addressed. But this is something we can see clearly from today's exam.

MR. HERRICK: Mr. Moore, you said this is how

it would have looked before 1850. Do you mean this is how it would have looked pre-reclamation, if not during reclamation?

MR. MOORE: That's correct. It would probably be the pre-reclamation.

MR. HERRICK: Thank you. And your next map on that exhibit?

MR. MOORE: Again, this is from the same series of 2009 photos. This is an area on the Sacramento River near Chico.

And the purpose of this is just to show how the water features, stream meanders, and all that we have identically in the Roberts Island we're talking about.

And what's nice about this is it shows the Sacramento River, how it would be flowing as Duck Creek or Slough or anything else, Middle River, Burns Cutoff, you name it.

We can see here this screen shows how we have cut off oxbow meanders, and this feature here shows very clearly this is a classic stream example of how the stream is coming around this horseshoe bend.

Some day when there's a flood, this stream is going to cut across here. It would be what you would call an avulsive event. This would be cut off. You would have an oxbow left, just as we have down here.

And when you see these meander scars, these are the type of features, as this stream cuts its outer bank where the flow is the fastest, it migrates in that direction, and it leaves behind meander scars.

Down here we can see evidence of these meander scars and how they affect orchards in the area. And we can see tributaries. This is a good example of the type of features we're looking at in the Duck Slough/Roberts Island area.

MR. HERRICK: Thank you, Mr. Moore. Your next Exhibit is Mussi R-21. And I believe this is a compilation of the 1937 aerial maps. Is that correct?

MR. MOORE: That's correct. These are the 1937 aerial photos that Mr. Nomellini referred to.

This is a series of five or six of the photos that were registered and scaled to fit. When you look at the color at the top, they were registered to the 2009 orthophoto base that covers the entire area so we have a good map scale and equivalent scale and presentation across a series of photos.

These photos are not altered in any way other than just rescaling them to fit the current orthophotos.

MR. HERRICK: And the purpose of this map is you're building a base map upon which to compare the various historical maps; is that correct?

MR. MOORE: That's correct.

This way we have a good accurate survey base, or as accurate as we can get off 1937, so we can make an accurate comparison of all the different photos and features of the area.

MR. HERRICK: And along with this map, I have CD copies of all the '37 and '40 original aerial photos. And so I'll ask those be marked as Mussi R-21A and the copies are available here for anybody if they want them.

Now going to the next exhibit, Mr. Moore, it's entitled R-22. And this is a compilation of a number of maps and photos. Would you please describe that combination?

MR. MOORE: Yes.

We started with the same base we just saw in the previous exhibit, the 1937 photos with -- rectified to fit the maps.

Overlaid on that, we have a copy of the 1911 or 1913 Holt Quadrangle. And we have the 2006 Woods brothers irrigation map, and in this area we have overlaid on that the -- what is -- 1909, excuse me, Woods canal from the 1909 map that had been presented in previous exhibits.

Again, these -- what we did on these, these were just rescaled a bit, and the backgrounds like the

white background or whatever was dropped out so we can see how they correspond to the features on the aerial photo.

MR. HERRICK: Mr. Moore, the 1913 quad map had colored features on it, but those colors are not on this map; is that correct?

MR. MOORE: That's correct. This version that I received was a black and white version, so everything that was just white background and had no features at all on it was deleted in the Adobe Photoshop program.

MR. HERRICK: Now Mr. Moore, you're using this combination map, R-22. That will be the base map over which you lay other historical maps; is that correct?

MR. MOORE: That's correct. We did it in this manner, or I did it in this manner, so that we would have good geographic landmark comparisons to see where the older maps that we overlaid will fall into place and will fit.

MR. HERRICK: Okay. Your next exhibit is R-23. And R-23 overlays on your base map a map entitled Map Showing the Lands of the Tideland Reclamation Company by Mr. J.T. Gibbes dated 1869.

And I have that map itself with the blow-up which we'll mark 23A available for everybody. But mostly the discussion will be about 23, not the 23A.

If you'll please explain Exhibit R-23.

MR. MOORE: Yes.

Again, this was the base we just referred to. We'll be using the same identical base on which the various maps were overlaid. I'll pause a second while he hands that out.

This was the same base we just referred to with the overlays of the 1911 Holt Quad, the Woods, et cetera.

This is a feature we're talking about --

MR. HERRICK: Now Mr. Moore, when you say "this" you're pointing to it with the pointer, but you have to describe it better for the written record please.

MR. MOORE: This is the waterway that is represented on the map --

MR. HERRICK: When you say "this," the court reporter -- it says "this" and it doesn't say where on the map are you referring.

MR. MOORE: Oh, excuse me. Yes.

This waterway begins at Burns Cutoff, proceeds in a southwesterly direction, and then hooks and turns to the southeast, and there is three tributary channels on this feature.

MR. NOMELINI: It's the particularly bold line

on the map.

MR. MOORE: Yes, this is the black bold line beginning at Burns Cutoff in the area where we also see Duck Slough proceeds southwest just across the railroad tracks, I believe that is. Correct me. Is that Highway 4 or railroad tracks?

MR. HERRICK: The railroad tracks.

MR. MOORE: Railroad tracks.

And then it turns and proceeds to the southeast where we see three tributary legs extending off of it.

MR. HERRICK: Now Mr. Moore, do you take this to be a Duck Slough feature or a different feature or a part of Duck Slough and other features?

MR. MOORE: I believe this is a part of Duck Slough although it doesn't align perfectly. We are talking 1869 where the survey techniques were in very serious doubt as far as the accuracy.

And I think in studying this I feel that the situation was it began at Burns Cutoff in the same area or possibly identically where Duck Slough is.

It correlated or corresponds with the southwest direction of Duck Slough.

Then where it turns to the east -- or southeast, excuse me -- I believe it actually corresponds to this feature we have today that comes off

the railroad track area.

If this had been accurately located -- I think what the surveyor did was follow Duck Slough; and where it turned to the southeast, they were following this feature here.

MR. HERRICK: So your interpretation of this map is that the bold black line, which is representing a slough apparently, matches a portion of Duck Slough, and then matches a portion of a tributary channel to Duck Slough; is that correct?

MR. MOORE: That's correct. And that's also true of the three tributary lakes we see on that southeast end. They also correspond to channels we have previously testified to.

MR. HERRICK: So Mr. Moore, in your opinion, does this map indicate that Duck Slough did not continue along what has been referred to as the High Ridge Levee line?

MR. MOORE: No, not at all. Duck Slough definitely did continue. This would have just been a tributary to Duck Slough.

MR. HERRICK: Thank you. Your next exhibit is R-24. And you have overlaid on this a map entitled -- excuse me -- Plat of Two Bodies of Land Notoriously Swampy and Overflowed.

And as I pass those out, we'll make those 24A just so that the original or a copy of the map itself is available.

And if you'll just explain again what you did here and how it may match other features.

MR. MOORE: Yes. This is very similar to the previous exhibit we just looked at. It begins at Burns Cutoff in the same general area as Duck Slough. Might be identical to Duck Slough. We can't be positive of that.

It proceeds in the same southwest direction down to the area of the railroad tracks as with the previous exhibit. Then it also turns southeast where you can see -- in this case we are only seeing about one tributary arm.

But they are in the same general vicinity as the previous exhibit, and they do correspond to the potential tributary that we just testified to.

MR. HERRICK: So again Mr. Moore, do you believe that the representation on this swampy and overflowed map is inconsistent with the other maps showing Duck Slough running along the High Ridge Levee line or consistent?

MR. MOORE: This is consistent. This -- where it proceeds southwest, I believe that is consistent with

the Duck Slough/High Ridge Levee.

Where it turns to the southeast, I do believe that is consistent with the tributary arm that we see in the 1937 photos and is there today in the presence of a canal.

MR. HERRICK: Now Mr. Moore, let's go out of order. Let's go to your R-29 please. And this is one of the maps from the Lajoie testimony overlaid on your base map; is that correct?

MR. MOORE: That's correct.

MR. HERRICK: And the Lajoie map is one that indicated certain features in different colors, and if you could just explain briefly what those colors and features from the Lajoie map indicate?

MR. MOORE: The colors we are referring to are the red colors. If you could pan down just a little bit, move the image up. Excuse me. That's good.

Again at the top of the image we're seeing Burns Cutoff. In the Duck Slough area we're seeing the red wide line coming down, corresponds near perfectly with crossing the railroad tracks, going around a hook or oxbow, as we call it, proceeding to the southwest past the yellow parcels that are Pak and Young and Mussi.

Similarly at the portion of the railroad tracks

when we see Duck Slough from Burns Cutoff down to the railroad tracks southwest, we see the red channel proceeding slightly southeast and to the south, and we see two roughly parallel channels to this, each parallel stepping off to the east.

These red channels are the sedimentary or clastic sediments that Mr. Lajoie testified to that were mapped from the 1952 soils maps.

Their presence there is a positive indication that significant amounts of water flow there because you had to have significant flow to carry these heavier deposits.

We can see how they correspond not only to the tributaries of Duck Slough, but one on the east side proceeds almost to Burns Cutoff, and the middle one we see tributary arms that correspond very closely with the tributary arms from the previous two exhibits.

MR. HERRICK: So Mr. Moore, in your opinion then, the two previous maps that showed or apparently indicated Duck Slough turning to the southwest and breaking off into channels, you interpret that as just a representation of other channels which, according to Mr. Lajoie and other testimony, appear to feed to the north into Duck Slough or into Burns Cutoff, correct?

MR. MOORE: That's correct. I believe you said

southeast. I think you meant south -- you said southwest. I think you meant southeast. But that's correct.

We have the main channel of Duck Slough. Then we have the tributary cutoff of Duck Slough in which this was a very strong water feature as evidenced by the dominance of the clastic sediments continuing all the way to Duck Slough.

And where there's a connection between these and nearly parallel to the east channel, we can see these tributary arms which correspond very closely to the finger tributary arms shown on the previous exhibits.

MR. HERRICK: Thank you. Mr. Moore, your next exhibit is 29, going back to the correct order, R-25 -- I just said that wrong. Your next exhibit is R-25.

And again, that is your base map overlaid with the historical map, and the historical map being the State Engineering Department Topographical and Irrigation Map of the San Joaquin Valley which has been previously presented, I believe, as part of the testimony of Mr. Neudeck; is that correct?

MR. MOORE: That's correct, yes.

MR. HERRICK: And would you please describe how the representation of Duck Slough on this map matches

the features on your base map or does not match?

MR. MOORE: Yes. Again, we are beginning at Burns Cutoff and proceeding southwesterly.

We see bends in the stream that correspond near perfectly with the classic oxbow that we've seen in the Duck Slough feature at the railroad track.

It then proceeds to the southwest. All of the bends and all correspond to Duck Slough. They do not register. They are off to the east of Duck Slough. Whether this is a survey error or whatever, they so closely parallel and correspond that I feel these are definitely Duck Slough features, and we'd have to leave it up to a surveyor to figure out, you know, why it doesn't fit precisely.

MR. HERRICK: And Mr. Moore, hypothetically, if the line was representing a levee instead of the slough, wouldn't the line then go the entire extent of the levee and not part of it?

MR. MOORE: If the levee was complete, that would be true.

MR. HERRICK: Okay. And because there are slight differences between the line from the overlay map and the lines on the base map, you don't take that as a serious disagreement as to the placement of Duck Slough, do you?

MR. MOORE: No, we don't because they correspond, for instance, in Section 22 where the square lines you see there -- this particular map had the section corners, and we have the section numbers in both from later maps as well as the ones from the original map.

But they run through the same relative place in Section 22. You see our 1937 area as well as this map's area are both in the southeast quarter of Section 22. All of these correspond.

The reason it's maybe a hundred feet or so to the east, most likely it's just errors in survey plotting, different datums used in surveying. For instance today -- between 1927, 1983 maps, you easily can have 80 or 100 foot differences in the maps.

So I don't see this as anything but representing that Duck Slough was indeed in that area.

MR. HERRICK: Thank you, Mr. Moore. Let's go to your Exhibit R-26 now.

And again, if you'll please confirm this is your base map previously described overlaid with the Sacramento and lower San Joaquin Valley showing swamplands district map, and I'll get that up here in just a second.

We'll label the map itself which you used for

the overlay as 26A, and I'll pass that out.

If you could briefly describe what this indicates.

MR. MOORE: Again, this shows a feature beginning at Burns Cutoff proceeding southwest. In this case, this map had near-perfect correlation to the '37 and the 1911 Quadrangle maps.

It shows the oxbow bend at the railroad tracks which is one of the notable features of Duck Slough, then it proceeds off in the southwest direction just as Duck Slough does.

MR. HERRICK: And Mr. Moore, you don't take this to be some sort of misrepresentation of Duck Slough because it doesn't have any tributary or distributary channels off of it, do you?

MR. MOORE: No, I don't. Not at all.

MR. HERRICK: So it just appears to be the cartographer or engineer, whoever it was, representation of Duck Slough. And it looks like it was more of an approximation rather than a survey line, correct?

MR. MOORE: That's correct.

MR. HERRICK: Let's go to your exhibit now, 27. R-27. Now Mr. Nomellini presented in his case -- excuse me; in his testimony which he labeled exhibit DJN-R Exhibit 16. This is that map from the Hammond Hall

collection of the State Archives, and this map now shows a much larger feature of Duck Slough, does it not?

MR. MOORE: That's correct.

MR. HERRICK: And if you could just please describe how far that feature from the Hammond Hall map matches the lines on your base map.

MR. MOORE: Yes. This feature does correspond much more closely to the present-day location of Duck Slough.

And Duck Slough is also noted here more down in the middle versus a previous map that was up at the north. And if we could pan down again, Mr. Lindsay, please.

The end of this line is here. The line that Mr. Nomellini pointed out being about four miles I also measured as a direct line as about 3.3. So this is probably five miles from Burns Cutoff where this extends.

And we get very close correlation to the present mapping and even closer correlation to a feature on the 1911 Holt Quad that indicates a stream flowing through this area.

So this map has near-perfect correlation with both the aerial photos and the 1911 USGS Quadrangle.

MR. HERRICK: And again Mr. Moore, if for

purposes of argument one were to say that the line from the overlay map was a levee and not a slough or waterway, would you not agree that that line would then have to go all the way to Middle River which is what the levee did?

MR. MOORE: Correct. If there was a manmade levee there, it would have gone to Middle River. It would not have stopped.

MR. HERRICK: And then according -- in your opinion, then, does this map provide an accurate representation of a larger portion of Duck Slough as opposed to other maps from the same area?

MR. MOORE: Yes, definitely. The accuracy of the overlay, the extent, all this is a very good representation of Duck Slough.

MR. HERRICK: And Mr. Moore, you showed us maps of lands that seem to reflect pre-reclamation lands, and those had numerous other channels and smaller sloughs.

Would you assume that because this map doesn't have any other small channels or sloughs flowing into this representation of Duck Slough that that means they did not exist?

MR. MOORE: No, absolutely not. They definitely existed. They were just not mapped.

MR. HERRICK: In fact, it's likely that most of

these lands were draining into Duck Slough depending upon the conditions and the tides and the weather; is that correct?

MR. MOORE: Highly likely. Because we can see evidence of that not only in analyzing the photos but in later topographic surveys of the area.

And again, if you remember back to that Antioch photo, you see a main waterway with tributaries that branch into it, and, you know, there were just many, many of these, and when this area was swampland they probably could not even survey those accurately.

MR. HERRICK: And depending on how much was reclaimed, those swamplands would be filled with tules and other features that may prevent the casual observer from actually mapping those smaller streams; is that correct?

MR. MOORE: Oh, absolutely. In those days, they were out there mechanically pulling chains and all to measure, and they -- much of this area was not accessible for any kind of accurate measurement.

So even the maps that were roughed in and all, that's probably what explains their inaccuracy to today's standards.

MR. HERRICK: Let's move to your Exhibit R-28. And I believe this is not the base map but the 1937

aerial compilation map with certain notations that you put on it; is that correct?

MR. MOORE: That's correct. This is the identical base map of the '37s, but I did not overlay the Woods Irrigation and the Holt Quadrangle as in the other. The photos are identical, but we just concentrated on Duck Slough and the area of the Mussi parcels and the features we see there.

MR. HERRICK: Mr. Moore, let's start with the Mussi parcel which is labeled -- it's sort of in the almost left center, little lower than center, but it's labeled Mussi parcel.

Could you explain whether or not you see any remnants of Duck Slough and whether or not you think there's any water in those remnants?

MR. MOORE: Yes. In fact, Mr. Lindsay, if we could zoom in on this general area here. You don't have to get real close. Just so we can read the text a little better.

That's good.

Yes. Here we see definite evidence. If we remember back to the Sacramento River channel example that we showed at the beginning where we could see meander bends and so on, we are seeing the Duck Slough water channel coming off -- this is definitely water in

here. We can see sunlight reflections off the water. And this is the adjacent photo to the north. This is water in the channel.

We can see where that channel extended and made one of those hooks or oxbow meanders as we call it. Comes down. It makes another oxbow meander on Mr. Mussi's parcel. Continues.

And these are the type of meanders scars we pointed out in the Sacramento River example.

This continues down onto the Robinson parcel. Again we see another oxbow meander of it.

It continues roughly paralleling Duck Slough. Again we see another oxbow meander of the water feature, and we know there's water in it. We can see water. We can see sunlight reflections up here.

The Robinson parcel is being irrigated at the time of this photograph in 1937 because these are sunlight reflections off of the water.

MR. HERRICK: So if we could pan the picture the other direction a little bit please?

And again, Mr. Moore, do you also see those same remnant features on this other portion of the map and what -- do you see any water in them?

MR. MOORE: Yes, we definitely do.

In fact, I have a point here where we see the

water. I made this notation that straight line distance from Duck Slough. This was 3.3 miles. If you follow the sinuous path, you would probably be more in the neighborhood of 4 miles.

We can trace water in the canal coming up. It comes right through this property to the north of Mussis. Continues. This is all water in these features. Continues up here.

We don't see the water on this parcel. We pick it up again on this parcel where it had been diverted and is running out in this direction.

And we can see numerous water features just to the east of the Duck Slough area as we just pointed out.

MR. HERRICK: So Mr. Moore, in your opinion, was there -- in your opinion, did the historic Duck Slough extend only two miles from Burns Cutoff or did it extend much farther?

MR. MOORE: Oh, much further. Definitely much further. This shows that clearly from all the geologic or geomorphic features that are very clear on this photo, just as they were clear on the Sacramento River photo, we see water in the feature. We see it closely paralleling.

And if we were able to get the detail off of that Holt Quadrangle, it is even mapped in 1911 as a

stream going through here that corresponds almost perfectly with the water features we see here.

MR. HERRICK: Mr. Moore, the exhibit I have -- I passed out is a duplication of the one I referred to from Mr. Nomellini's testimony, so we'll just use that and not this.

So we'll give a new number to your last exhibit. And I apologize to the Board and the parties. There was supposed to be an overlay with this map, but that didn't get through the translation through me and in printing.

So here's the map. I'll pass that out. We'll label this map Mussi R-31 so there's no confusion. And as I pass that out, you can give a brief explanation please.

MR. MOORE: Mr. Lindsay, if you could pull up the previous exhibit please?

CHIEF LINDSAY: What was the number on that one?

MR. MOORE: 28. Yeah. Pull up Exhibit 28, please. Then if you could zoom in to that area.

This is a map of Charles Widdows' survey of 1927.

MR. HERRICK: By "this" you mean R-31?

MR. MOORE: Correct.

MR. HERRICK: Continue, I'm sorry.

MR. MOORE: This is a topographic survey performed by an engineer in 1927, so we're at an area here where we can rely much more on the accuracy of the map. It covered the lands for Alice M. Woods as stated in the legend of the map.

Before we continue, we want to look down at the legend in the lower left-hand corner of this map where the important things here are where he shows red -- you won't see it on the exhibit. This is just on the map handed out.

But the two main features we're looking at -- or three, excuse me -- it shows red for drainage canals. It shows the blue with little dashed lines in them for irrigation canals. And it shows the hashered lines for the levee.

What we're looking at here is again we see the bend representing the Mussi parcel just as we see on this map shown as the Vasquez property.

When we proceed up, if we come right over here, a good place to start is just to the east of the Mussi or Vasquez parcel. We see a dark feature indicating there's water.

There's water coming down as we testified to previously, cutting over in this kind of bow-shaped

parcel that again on this map is shown as a drainage canal.

It proceeds, cuts to the northeast, and proceeds into this area right here just to the east of Duck Slough.

And the important thing here where you see the green is the background on your map and all, these are just the representations of the topographic elevations.

Where you see the red and the blue lines that correspond to what we see in the map legend, we have near-perfect correlation where he is indicating irrigation and drainage canals that fall in near perfectly with the water features we're seeing in the 1937 photos where we clearly had water features, tributary features in that area, and they were being used as irrigation and drainage canals.

So the farmers in that day had taken, in 1927 or before, and had improved and morphed the natural tributaries to Duck Slough and improved them into what Mr. Widdows was mapping as irrigation and drainage use.

MR. HERRICK: And Mr. Moore, the map which is R-31 appears to show features of irrigation and drainage going from the southwest side of Duck Slough over to the northeast side into the Pak and Young property; is that not right?

MR. MOORE: That's correct. I'm getting myself -- yeah. About this bend here, there is a feature that cuts across Duck Slough, and that proceeds to the north, northwest through the Pak/Young parcel.

Where we see -- on this map where we see features shown in dark that are water features confirmed by the sunlight reflections that go down almost to the Mussi parcel, there's near-perfect correlation with the dashed red and white line shown on the Widdows map, the dash meaning it was used for both drainage and irrigation. We have near-perfect correlation with the water features shown on '37 and the 1927 survey.

MR. HERRICK: So in your opinion then, the farmers in this area were using the historic features to connect their lands for both drainage and water supply, and those connections included Duck Slough; is that correct?

MR. MOORE: That is correct.

MR. HERRICK: I think that's all for Mr. Moore.

And Mr. Landon Blake will be next.

CO-HEARING OFFICER BAGGETT: We're going to take a ten-minute break.

(Discussion off the record)

CO-HEARING OFFICER BAGGETT: Okay. We're back on the record.

MR. HERRICK: Thank you. Our next rebuttal witness is Mr. Landon Blake who has not taken the oath in this proceeding.

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LANDON BLAKE

Called on rebuttal by RUDY MUSSI, TONI MUSSI AND LORY C. MUSSI INVESTMENT LP; YONG PAK AND SUN YOUNG

DIRECT EXAMINATION BY MR. HERRICK

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CO-HEARING OFFICER BAGGETT: Do you promise to tell the truth in these proceedings?

MR. BLAKE: I do.

CO-HEARING OFFICER BAGGETT: Thank you.

MR. HERRICK: Mr. Blake, you're here to rebut testimony regarding questions raised over the call lines for deeds and how that may compare to natural features at issue here.

Would you please proceed with your testimony?

MR. BLAKE: I was told that a boundary surveying issue of importance in this hearing is the location of the easterly boundary of the Pak parcel.

What I'd like to do -- maybe we can ask Mr. Lindsay -- I think we need to introduce two exhibits. I need to introduce my written testimony

which you have in front of you and then another diagram.

So if we can grab the diagram that says -- the title of it for the paper copy is Pak and Young parcel. And then -- yep, that's the one, Mr. Lindsay. Thank you very much.

Oh. I'm sorry. Close that. That's my written testimony. It's the one -- the second one from the top, Mr. Lindsay. Easterly boundary. Yeah.

So I'd like to ask the Members of the Board, maybe they can keep that diagram to the side because we'll probably refer to that throughout.

MR. HERRICK: And we'll start with you have a written testimony, and we'll label that Mussi -- although it's for both hearings -- Mussi R dash, and pick up where we left off. This will be R-32.

MR. BLAKE: Do we want to label the Exhibit 33?

MR. HERRICK: Yes. We'll make the diagram that you have, which says cross-section at the bottom and plan view at the top, label that 33, R-33.

MR. BLAKE: So I was instructed to examine the deeds related to the Pak and Young parcel to determine the location of the easterly boundary of the parcel.

So I've done that and have come to the conclusion that the correct location for the easterly boundary of the Pak and Young parcel is the center line

of Duck Slough after the date of the conveyance from J.P. Whitney to M.C. Fisher and before the slough may have been filled in.

So based on that conclusion, the Pak and Young parcel would have had a direct connection to Duck Slough.

And what I'd like to do now is just take a few minutes and walk the Board through some of evidence and the logic that I used to come to that conclusion about the location of the easterly boundary of the Pak and Young parcel.

So I started with an examination of the chain of title for both the Pak and Young parcel and the lands to the west, specifically the Mussi lands.

So Mr. Lindsay, can we just leave that exhibit up, that one we just had? Just keep that up for a while. Thank you.

So the patent in this case from the State of California to J.P. Whitney is not material to the matter I'm going to discuss because it doesn't include a call to the line between the Pak parcel and the parcels to the west. So for our purposes, we don't need to worry about the Pak.

In my written testimony -- this is on page 1, the last bold heading there we talked about, transfer

number two and therefore number three.

Those were two deeds from J.P. Whitney to M.C. Fisher recorded on the same day, January 24th, 1876. And to make this easy for us, I'm going to refer to the first of those deeds as the west Fisher deed throughout my testimony and the second deed as the east Fisher deed throughout my testimony. That will make things a little easier to keep track of.

So we're going to start with the deed from J.P. Whitney to M.C. Fisher. This is the west Fisher deed. Now this is the ancestor deed in the chain of title for the Pak and Young parcel.

So this deed contains a controlling call that helps us to establish the location of that easterly boundary of the Pak and Young parcel, and I would like to read a portion of that controlling call to the Board and it is -- this is in my testimony. This is on the top of page 2. This is the last half of paragraph four. And those paragraphs are numbered in my testimony.

So the call says -- describes portions of Sections 13, 14, 22, and 27, lying west of the High Ridge Levee which extends from Burns Cutoff to Middle River.

And that location of that controlling call and the deed is the top of the second page. And the deed

itself is an exhibit, Exhibit 3C in the Pak/Young matter. The call's in the top of the second page of Pak and Young, Exhibit 3C.

So again that call is portions of those sections lying west of High Ridge Levee.

I'd like to talk a little bit about the second of those deeds, the east Fisher deed. This is in P5. And it conveyed a large portion of what we know today as Middle Roberts. That was from J.P. Whitney to M.C. Fisher.

This deed also contains a controlling call for that same line. So these two deeds together create that common line which would be the easterly line of the Pak and Young parcel.

So I would like to read you that call from the deed, and it says:

> Portions of Sections 12, 13, 14, 22, 23, 27, and 34 lying south and east of the levee constructed along High Ridge and Duck Slough.

So you notice there is a difference there in the calls. In the west Fisher deed we have the additional qualifier of Duck Slough which is not present in the east Fisher deed.

(Discussion between counsel and witness)

MR. BLAKE: Did I? I'm sorry.

The east Fisher deed has the call for Duck Slough. The west Fisher deed does not. Thank you for clarifying that.

Now I want to give you the location of that other controlling call because it's important. This is the controlling call in the east Fisher deed. This is in -- it's about 19 lines down on -- I believe it's the first page of that document. And that is Mussi Exhibit 3C. 19 lines down in Mussi Exhibit 3C is that call.

So I'm going to move on now. This is paragraph 6.

To a person that isn't familiar with boundary surveying, if you only look at the deed, the west Fisher deed, which is the ancestor Pak and Young parcel, you might imagine that you have to locate that property line somewhere on the levee.

So if you look at my diagram, you can see there on the left-hand side of the page I have High Ridge Levee noted.

So there's a number of different places a surveyor might put that line based on the call on the deed. He might put it at the west toe, the centerline of the levee, the east toe, or some other location.

So if you don't have the complete picture and you're not familiar with the principles of surveying, you may attempt to locate that property line somewhere on the levee.

However, in my professional opinion, that is clearly not a correct interpretation of that deed, and that's for two important factors.

So what I'd like to do now is just explain to the Board why I located the boundary of that Pak and Young parcel, the easterly boundary, at the centerline of Duck Slough and not somewhere along High Ridge Levee.

So there's two factors that I want to discuss. The first is that that levee, High Ridge Levee, actually serves in some manner as a meander line of the actual water boundary at the center of Duck Slough.

Then the second is a consideration of the intent of the parties when those two deeds from J.P. Whitney to Fisher were sold.

So we'll start with the first factor there. So as I explained before, it's important to look at both of the deeds on each side of the line that created that line in common and consider them together.

So although the west Fisher deed doesn't have that reference to Duck Slough, it's clear that the east Fisher deed does.

And we're going to talk in just a few minutes. If you interpret the calls in those deeds literally, you are going to create a gap in ownership, and I think that clearly wasn't the intention. So we'll come back to that.

This is going to move us. This is page 3, just summarizing paragraph eight here.

One of the other factors we want to consider is the second factor, what boundary surveyors would typically do when they were dealing with a water boundary. And this especially applies to areas in the Delta or other areas in the United States where you have levees for flood control purposes along a water body.

So boundary surveyors would typically survey and use the centerline of the levee in a legal description on a map to proximate the actual fee ownership which would extend to a water mark. In this case, it would be the high water mark.

There were a number of reasons why a surveyor would use that levee as a meander rather than try and the surveyor describe the actual water boundary. So let me just give those reasons to you briefly.

First of all, the levee would be a prominent topographic feature that would be a good approximation of the water boundary. It was easier to survey along

the levee. The levee was higher, typically clear of vegetation. And it would be easier to -- a surveyor describe something along the crown of the levee than it would be at the edge of a water body, especially in this period of time.

Furthermore, the centerline of the levee or levee itself was much more permanent and fixed in location than a water boundary.

A water boundary is subject to gradual movement with the body of water, so it was easier to survey a more permanent feature like a levee.

And finally the physical location of a levee would typically control the amount of land that was suitable for agriculture and was also used to protect the land from flooding.

So really, the levee becomes a very important feature in how much land, usable land, land suitable for agriculture is actually being conveyed.

So there's a number of reasons then why a surveyor or someone else describing property would use the levee as an approximation of the actual water boundary.

In paragraph nine, I simply provide some references that show this is a standards practice. I list several different sections from the BLM Manual of

Surveying Instructions that provided the original GLO or General Land Office surveyors with instruction on when and how to meander a water body.

And even though GLO surveyors weren't involved in this particular case with the two deeds in question, I simply wanted to provide that to show that meandering a water body was a standard surveying practice throughout the United States, not only currently but in this time period.

And I apologize. I left the copies of those sections at my office this morning, but we'll make sure that they get to the Board and the other parties. I did forget those.

Moving on to photograph ten. I also want to explain that it's a standard practice of surveyors to extend -- not extend; that's the wrong word -- to interpret the location of the boundary at the riparian or the water feature and not at the levee.

And certainly in this case, what helps us to do that is an examination of that other deed, the east Fisher deed that contains that call to Duck Slough.

And just as an explanation of why it's reasonable to do that, in cases where you have a call that's somewhat ambiguous or indeterminant, it's an established surveying principle that you can look at the

intent of the parties to try and clarify that call.

So when you think about the west Fisher deed which is the ancestor for the Pak and Young parcel, there's some ambiguity about what he really meant when he described that call along High Ridge Levee.

So that's why I'm going out to the adjoining deed to try and determine what was the intent of the parties. I think the intent of the parties was to convey that property on each side of the slough.

So that's what I'm basing my conclusion on, and I list two different references that highlight that principle of considering the intent of a party when interpreting a deed.

One is the fifth edition of Brown's Boundary Control and Legal Principles. And that's one of your copies. We don't need to pull that out and look at it but it was provided. We probably should give that an exhibit number though.

This is Brown's Boundary Control and Legal Principles. I copied several pages from that, three or four pages.

MR. HERRICK: That would be R-34.

MR. BLAKE: R-34.

I provided another reference. This is from the book Writing Legal Descriptions in conjunction with

boundary survey control. Again, it talks about when you have an indeterminant call you can look at the intent of the parties, and we should probably also assign that an exhibit number.

MR. HERRICK: Writing Legal Description then is R-35.

MR. BLAKE: Yes, Writing Legal Descriptions. That's correct.

So I just provided those references so the Board understands that in this particular situation it's acceptable to consider that adjoining deed and the intent of parties to determine where the lines are located.

So when I consider those two factors, it's clear to me that the property line, the easterly property line or boundary of the Pak and Young parcel, would be the center of Duck Slough.

And one thing I forgot to mention that I would like to bring out briefly is: It's interesting to note to me that in the east Fisher deed the call to Duck Slough is associated with all of the public land sections from Burns Cutoff to Middle River, which is an indication to me that the slough indeed at the time those descriptions were written ran from Duck Slough all the way down to Middle River, so I just want to point

that out.

Now someone may argue that it's incorrect to literally interpret the calls as they are written in the deeds. And I believe that that is not true, and I would like to take a minute to explain why. This is in paragraph 11.

If you look at the diagram I provided, if you were to literally interpret the calls in those two deeds, the west Fisher deed and east Fisher deed, what you would do is you would create a gap between the ownerships that would extend underneath the levee all the way across to the far bank of Duck Slough.

And I really believe that that wasn't the intent of the parties. Furthermore, as a surveyor, if I can find a reasonable alternative solution that does not create that gap, then I'm going to try and do that if I can. That's reasonable.

And I think the solution that I've come up with, holding the property line at the center of Duck Slough, is a reasonable alternative that does not create that gap.

And furthermore, it's been the practice of surveyors in my part of California, my region of California, to use that same principle to hold the property line not at the levee itself but at the actual

water body.

And there's two or three reasons why a surveyer would want to do that.

First of all, I think it's the most reasonable solution considering the scenario we have here.

Secondly, I think that's faithful to the intent of parties which was not to create a gap but to transfer land on either side of the slough.

Furthermore, application of that principle avoids the creation of these gaps or no-man's-land, these strips underneath the levee and the water body, and avoids creation of those strips.

And if you fail to adhere to that principle, you would create all kinds of problems in the survey and land system in our area.

And I don't know of any competent surveyor familiar with surveying practices in our region of California that would make that assertion. It just doesn't make sense. We wouldn't do that.

Paragraph 12, I mention another map that I'm going to submit as an exhibit. This is just another example of a surveyor that created a map in our area, and he surveys the centerline of the levee, but you can tell the true boundary location is actually at the body of water.

And just for the record, that's a subdivision map filed in Book 8 of Maps and Plats at page 32, San Joaquin County Records. It's entitled Banta Irrigated Farms.

You can see on that map -- I think we can take a minute to look at it.

MR. HERRICK: That would make that map R-36.

MR. BLAKE: Just briefly to take a quick moment to look at the map.

You can see in the upper right-hand corner the San Joaquin River there. I'd just direct your attention to lot 24 and lot 23.

We can see at the boundary of that lot the surveyor has actually surveyed the centerline of the levee. He has bearings and distances along that.

But you'll notice in his notes about the acreage there -- for example, under lot 24 it says 108.6 acres. Then he says plus or minus to the bank of the river.

So the surveyor is indicating that he knows the fee ownership of those lots extends to the water boundary, even though he only provided the meander of the levee for some of the reasons we discussed above.

So that's just another example of essentially the same principle that would apply to the two Fisher

deeds we have been discussing.

Now I'd like to briefly move through the subsequent -- some of the subsequent transfers in the chain of title for both Mussi and Pak and Young.

So this is a transfer number three. This is paragraph 13. That was a deed from M.C. Fisher to Stewart, Bunten, and King. I just want to point out that it uses the same language for that controlling call along High Ridge Levee as the previous deed that we discussed, the Fisher deed.

Transfer number four. This is on the Mussi side, the west side. Again, they used the same controlling call as the previous west Fisher deed. They describe High Ridge Levee and Duck Slough running through the section so there's no changes there.

Then we come to transfer number five. This was from Stewart, Bunten, and King to Mr. Vasquez. This is on the bottom of page 5, paragraph 15.

Now this is an important point to stop and discuss paragraph 15 and paragraph 16 because at this point in the chain the description of the controlling call changes. So they no longer include a reference to Duck Slough, and they only reference the centerline of High Ridge Levee.

So I would like to point that out. That

happens in both of those transfers, transfer number five and transfer number six.

What I'd like to do for a minute is explain why that does not move the boundary from the centerline of Duck Slough to the levee. So that's an important concept. So let me take a minute to explain that.

Even though from this point in the chain forward and the current deeds today, even though those documents reference the centerline of High Ridge Levee, a boundary surveyor still has to go back and look at what was actually conveyed earlier in the chain of title.

You cannot arbitrarily move that easterly boundary of Pak and Young from the centerline of Duck Slough to the center of the levee because, as an example, the owners on the west side, they cannot convey in their deed property beyond the centerline of the slough they don't own.

So a surveyor would have to go back through the chain of title to determine what is really owned and what can really be conveyed.

So I just want to point out that even though the deeds from the point of transfer five and six forward reference the centerline of High Ridge Levee, that cannot be the current correct location of that

boundary based on the other facts previously in the chain of title that we've discussed today.

So just to summarize my conclusion, when I looked at both chains of title on the east and west side of High Ridge Levee/Duck Slough, it's clear to me the boundary that was created when the east/west Fisher deed and -- I'm sorry -- the west Fisher deed and east Fisher deed, when those were sold, the boundary line that was created was at the center of the levee or the center of Duck Slough, not at the center of the levee or any other feature on the levee.

And I really believe in my professional opinion that there is no other reasonable location for that boundary line based on all the facts.

I believe that would conclude my testimony.

MR. HERRICK: Mr. Blake, let me ask two follow-up questions.

This gap in ownership, if that -- if the interpretation that results in that gap was correct, that gap would have occurred when Whitney sold both sides of Duck Slough to Mr. Fisher, would it not?

MR. BLAKE: That's correct.

MR. HERRICK: And is there anything in the record that would indicate that when Mr. Whitney sold tens of thousands of acres to Mr. Fisher that he either

mistakenly or intentionally left out a little stripped-down portion of the middle of the land?

MR. BLAKE: I have no indication of that. At no time have I found evidence that Mr. Whitney sold that strip to another party. He didn't exercise control over it. Didn't pay taxes on it.

Furthermore, that strip of land would be very important for purposes of agriculture, irrigation, navigation.

And so it doesn't make sense to me that that land would have been sold by Mr. Whitney to Mr. Fisher without the land underneath that potential gap there.

Furthermore, and I can't emphasize this point enough, if you were to throw my conclusion out and say no, there was a gap created there, that is going to create gaps and problems all over the Central Valley of California.

And I really don't believe that is a reasonable solution to this problem when I can rely on what I feel are sound surveying principles to determine a boundary location that does not create that type of gap.

MR. HERRICK: Thank you, Mr. Blake.

If Mr. Prichard will come up here, we'll finish.

SENIOR STAFF COUNSEL HEINRICH: Mr. Herrick, do

you want to mark the remaining of the exhibits, remaining exhibits for Mr. Blake's testimony now?

MR. HERRICK: We can. I think they are all deeds contained in other exhibits, but we can mark them right now. I'll just go through them.

Starting with the numbers we left off, let's make the State of California patent to Mr. Whitney R-37.

Then the deed from Mr. Whitney to Mr. Fisher would be R-38.

And I think that covers all of his included attachments.

MS. GILLICK: Mr. Blake also referenced another exhibit which he included in his testimony but he didn't have written copies. Is it the intent to provide that for the record or not?

MR. HERRICK: I don't think that's necessary. We can if we need to. He referenced pages from some of the manuals, I'll call them -- that's my word, not his -- from which surveying principals are derived.

SENIOR STAFF COUNSEL HEINRICH: I think there's one more exhibit.

MR. HERRICK: We marked that as R-36. That's the Banta irrigation map. He was discussing parcel 24, I believe.

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TERRY L. PRICHARD

Called on rebuttal by RUDY MUSSI, TONI MUSSI AND LORY C. MUSSI INVESTMENT LP; YONG PAK AND SUN YOUNG

DIRECT EXAMINATION BY MR. HERRICK

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MR. HERRICK: Mr. Prichard, in the cases-in-chief there was discussion with regard to whether or not lands could or would be irrigated through subirrigation or through the use of the high water table. And would you briefly discuss your analysis of that issue as I pass out a map? Thank you.

MR. PRICHARD: Okay. First I was asked to take a look at the crops that were grown in the area and also contrast that to the soils conditions and then relate that to irrigation practices.

The map that is currently being distributed, often called the Gateway map, shows a number of different crops that were being grown on these lands.

MR. HERRICK: Mr. Prichard, let me interrupt you there.

The map we just passed out which is R-39 is a Google Earth with the Gateway map put on it and perhaps other information.

The Gateway map was the exhibit to Mr. Mussi's testimony himself. I just want to make sure when you said this is the Gateway map, this is not it. This is a combination map.

MR. PRICHARD: Correct. This is a component of that Gateway map overlaying the top of Google Earth.

And subsequently, we were able to look at the soil types that were in the area of concern and to find that these crops and soil types would have definitely required irrigation to produce a crop that would have been reasonable for the time.

So once this land was reclaimed and drained and the water table was lowered or controlled, the application of channel water is necessary on a periodic basis to produce this -- a reasonable crop yield to support those kinds of activities.

No really, a no-irrigation option, given the soils and the type of crops in this area, isn't an option at all. And whether that would have been surface irrigation or subsurface irrigation, it had to be some type of irrigation that would have resulted in the use of channel water.

MR. HERRICK: Mr. Prichard, when you say subsurface irrigation, you don't mean the farmer would allow the shallow groundwater to rise up in the root

zone as irrigation, do you?

MR. PRICHARD: No. There's a couple different types of subsurface irrigation one relies on.

Lateral ditches which are 40 to 60 feet apart which are filled with channel water, the water moves laterally through the soil to recharge the soil profile for crop use.

And in another fashion, larger ditches are allowed to have channel water into them and then shut off while it soaks in, essentially using channel water for irrigation, not just raising the subsurface water which could be higher in salinity and basically drown out the low areas and not reach the high areas which would cause a drought situation there.

MR. HERRICK: Thank you.

I believe that concludes our rebuttal. If the witnesses will all come back here if the Chair wants to proceed with cross, we would be ready.

CO-HEARING OFFICER BAGGETT: Prosecution, are you ready?

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CROSS-EXAMINATION BY MR. ROSE

FOR PROSECUTION TEAM

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MR. ROSE: Good afternoon. David Rose,

Prosecution Team.

Very briefly, Mr. Nomellini, or whoever else can answer if you think appropriate. Looking briefly at Exhibit DJN-R, Exhibit 13, since the other 14 and 15 are just blow-ups, I'll ask you from this one.

There is a canal on the right-hand side of this map that on the blow-up at least is labeled present ditch and property line. Do you see that?

It goes straight from north to south starting at Middle River and then abutting what appears to be a meander that is very likely part of Duck Slough. Do you see what I'm talking about?

MR. NOMELLINI: Yes, I do.

MR. ROSE: So that straight north/south section, do you have any idea -- first of all, that does say present ditch, correct?

MR. NOMELLINI: Correct.

MR. ROSE: So it would be your understanding that when this map was created, surveyed in December 1923, it would have been there at that time?

MR. NOMELLINI: That would be my interpretation, yes.

MR. ROSE: Okay. Do you have any idea when that was filled in? And any of you can answer that if you --

MR. NOMELLINI: I think that ditch is essentially there today.

MR. ROSE: Holding water?

MR. NOMELLINI: Yes.

MR. ROSE: So you don't believe that it has been filled in?

MR. NOMELLINI: No, I think it's there.

MR. ROSE: Okay.

MR. NOMELLINI: I think you can see it on the Google or one of the other.

MR. ROSE: It doesn't -- sorry. I didn't mean to interrupt you.

MR. NOMELLINI: Go ahead. I think it's there.

MR. ROSE: It doesn't show up on the Exhibit R-31, does it? Definitely please take a look at it in answering that question.

MR. NOMELLINI: I don't think it's included in the Alice Woods property, so it wouldn't have been mapped on that exhibit, if I've got the right exhibit.

MR. ROSE: You do. I just was looking for your answer.

MR. NOMELLINI: It doesn't show there, but it's obvious that whoever made the map was not trying to show this other area that we're talking about.

MR. ROSE: And those are my only questions for

you, Mr. Nomellini.

I briefly have a question for Mr. Moore, looking at the same exhibit. That's R-31, the map dated January 1927.

Looking at the legend there, what's labeled as irrigation canal or ditch appears to be in blue or black. Do you see that?

MR. MOORE: Yes, I do.

MR. ROSE: Okay. And so using that, there appears to be an irrigation canal or ditch flowing from Middle River -- and I'm not suggesting it's flowing in one direction or the other; just to locate the endpoints -- from Middle River in an essentially northwesterly direction along what we've been talking about as Duck Slough; is that correct? High Ridge Levee?

MR. MOORE: Oh, yes. I see. Excuse me.

Yes, it does show an irrigation ditch alongside the hashered marks indicating a levee.

MR. ROSE: Where does that cease? Where does that end?

MR. MOORE: That particular feature appears to end about on the Mussi parcel by the -- what is it -- the Knighton School Road? Am I saying that correctly?

MR. ROSE: If you're asking me, I don't know

what that --

MR. MOORE: Kingston, yes. It appears to end where the Kingston Road cutoff is.

MR. ROSE: Okay. And it doesn't continue to the west of that point, does it?

MR. MOORE: I don't see that, no.

MR. ROSE: Okay. I don't have any further questions. Thank you.

MR. O'LAUGHLIN: Hearing Officer Baggett, why don't we, if it's agreeable to the Hearing Team, take a break and come back at -- pick a time, 12:30?

CO-HEARING OFFICER BAGGETT: That's fine. I think Charlie has a couple questions before we take a recess.

MR. O'LAUGHLIN: Oh, that's right. He's not going to be here. Yeah. I'm sorry. I didn't mean to interrupt your --

CO-HEARING OFFICER BAGGETT: With that, we'll ask -- Charlie has got questions. I don't know if other staff does. We'll do that and take a break for lunch.

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QUESTIONS FROM BOARD AND BOARD STAFF

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CO-HEARING OFFICER HOPPIN: Mr. Nomellini, we've talked a lot during the course of this about Duck

Slough being filled, and we've also talked a lot -- and I think you agree; if you don't, I know you'll correct me -- that Duck Slough was used both for irrigation and for drainage purposes; is that not correct?

MR. NOMELLINI: That's correct.

CO-HEARING OFFICER HOPPIN: And the gradient of the land would have enhanced the drainage feature, and obviously that was the way, prior to pumping reclamation water and all, that the drainage water went; is that not correct?

MR. NOMELLINI: I believe there was a gradient of some type from Middle River to Burns Cutoff, at least in those later -- the topographic maps.

The pre-reclamation gradient, I'm not sure of. But I think it was generally in some respect followed.

CO-HEARING OFFICER HOPPIN: I haven't heard anyone articulate what led to the filling of Duck Slough. I assume people wanted to expand their farmland and they did it.

But I don't understand if drainage laws were the same then as they are today how, without the consent of all of the parties, how anyone could be filling in a drainage feature that would impede drainage to someone else.

So I don't understand why they ever filled this

thing in the first place. Can you tell me that?

MR. NOMELLINI: Nobody -- in my opinion, none of the farmers, none of those people would have filled that without an alternate drain and irrigation system.

And some of the features are still there today. Not all of Duck Slough has been filled in.

So I think they would not have done it unless they had the alternate features in place, irrigation and drainage. And the reasoning that I've run into over the years is people square up their fields; if they've got the irrigation and drainage taken care of, they can farm more land.

CO-HEARING OFFICER HOPPIN: But I see irrigation features that are in the same proximity, but I don't -- have I missed the drainage feature?

MR. NOMELLINI: I think the drainage features are there. They go over -- some of them perhaps are still dual facilities in part.

They go over in that area -- for example, east of Inland Drive, let's call it, or High Ridge Levee, the portion of that area drains into Woods. And you've seen maps that show part of the Woods service area is drainage only.

That incorporates some of these areas we're talking about today that they still get just drainage

service from Woods. So they drain into those main drainage laterals that are still in existence today, and they come together and go through the railroad trestle and go over to the drainage pumping plant at Burns Cutoff. So those lands are not without drainage.

CO-HEARING OFFICER HOPPIN: I assumed they weren't. We've also talked a lot about the floodgates on Duck Slough at Burns Cutoff and at Middle River. You said today, and I think for the first time, that you didn't necessarily believe that Duck Slough was completely cut off when they put these floodgates in.

I'm having a hard time understanding why someone would put in a floodgate for the reasons we understand --

MR. NOMELLINI: Well --

CO-HEARING OFFICER HOPPIN: -- they had floodgates and leave part of the thing --

MR. NOMELLINI: Yeah --

CO-HEARING OFFICER HOPPIN: -- open to the natural course.

MR. NOMELLINI: -- opens for flood waters.

I think Duck Slough at one time had a levee embankment on both sides. And then as they -- and they had an exterior levee that they were trying to maintain in the early reclamation days. It was all one effort at

one time in that area.

And then around the time that the newspaper articles talk about, they tried to complete -- I'm going to call it High Ridge Levee -- which is an internal type of levee of more substance than it existed before.

So I think there is a possibility, although I don't know exactly when it was filled in, I just don't know that what we have seen so far indicates it was completely cut off.

I do agree that Middle Roberts had a -- tried to have a complete protection for it against the outside waters including those that back up.

But Lower Roberts also had embankment on its side.

So I'm not convinced that it was absolutely closed off at that time. Not that it makes a big difference.

CO-HEARING OFFICER HOPPIN: No, it was --

MR. NOMELLINI: I haven't seen enough evidence so I could tell you I agree that it was completely cut off in 1875.

CO-HEARING OFFICER HOPPIN: It was more a point of curiosity. I couldn't see how it affected this, but I couldn't understand why they would do that.

MR. NOMELLINI: I would visualize it as a

portion of the nature slough that was still leveed, you know, kind of a longer levee. Eventually somebody said why are we maintaining this extra loop? You know, let's cut across it and forget it and maintain the outside levee.

I just haven't seen the evidence, and what I saw of these articles didn't convince me necessarily that it went all the way. I just don't know.

CO-HEARING OFFICER HOPPIN: Okay. Thank you for your time.

CO-HEARING OFFICER BAGGETT: Okay. With that, we're off the record.

(Lunch recess)

AFTERNOON SESSION

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CO-HEARING OFFICER BAGGETT: Are we ready? Mr. O'Laughlin, you're up.

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CROSS-EXAMINATION OF NOMELLINI BY MR. O'LAUGHLIN FOR MODESTO IRRIGATION DISTRICT

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MR. O'LAUGHLIN: Thank you Mr. Baggett.

My name's Tim O'Laughlin. I represent Modesto Irrigation District. I will try to take you all in the order in which you testified.

Mr. Nomellini, on DJN-R EX number 5, you underlined in red the second to the last paragraph, beginning quotations with four miles of the crop levee.

What is your understanding of what is meant by the word or the phrase "the head?"

MR. NOMELLINI: I think head would normally mean the beginning of a slough.

MR. O'LAUGHLIN: Okay.

MR. NOMELLINI: Or beginning of a channel.

MR. O'LAUGHLIN: So when you read this, then basically you believe this is a mistake because in your testimony you opine that Duck Slough continued all the way past Honker Mound and goes to Old River; is that

correct?

MR. NOMELLINI: I don't know that it's a mistake. It might be in how you identify it. You know, we've been dealing with different identifications for different sections of this area.

But if it was intended to reflect that there was no channel the rest of the way, I'd say it's a mistake.

MR. O'LAUGHLIN: Okay. And taking the normal phraseology "the head" which would mean the beginning, you would assume that that was in fact a mistake then, correct?

MR. NOMELLINI: Yeah. Not a mistake if Duck Slough is defined by Mr. Tucker as only being that segment of the channel that I believe went all the way to Middle River.

MR. O'LAUGHLIN: In your rebuttal testimony, you said you have represented entities on Roberts Island for a numbers of years -- I think it's for years. How long have you represented entities located on Roberts Island?

MR. NOMELLINI: Lower Roberts, since the '70s.

MR. O'LAUGHLIN: Do you currently or at any time have you represented landowners within the service areas of Woods Irrigation Company?

MR. NOMELLINI: Yeah, I think I have.

MR. O'LAUGHLIN: Okay.

MR. NOMELLINI: I have general representation in my firm, and I do represent landowners that are located there, yeah.

MR. O'LAUGHLIN: At any time, have you or members of your firm represented Woods Irrigation Company?

MR. O'LAUGHLIN: No.

MR. O'LAUGHLIN: Do you represent any reclamation districts located in the vicinity at or near Middle Roberts Island?

MR. NOMELLINI: Yes, Lower Roberts. I represent Lower Jones Tract. I represent Victoria.

MR. O'LAUGHLIN: Have you received waivers from any of your clients in order to testify here today?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Looking at your exhibits -- and maybe we can flip through these and do this fairly rapidly, and I'm going to ask you specific questions.

So on DJN-R EX 1, is that a depiction of a facility that provides water to the Pak/Young parcel?

MR. NOMELLINI: Trying to get it in front of me, but I would say offhand no.

MR. O'LAUGHLIN: It's on the screen. I'll

wait. Take your time.

MR. NOMELLINI: Up there? No, that's on Union Island.

MR. O'LAUGHLIN: Okay. So same question: Is that specific to the delivery system to make irrigation water available to Mr. Mussi?

MR. NOMELLINI: That's correct.

MR. O'LAUGHLIN: It is not?

MR. NOMELLINI: Yeah, this is on Union Island which is across Middle River --

MR. O'LAUGHLIN: Okay.

MR. NOMELLINI: -- from where --

MR. O'LAUGHLIN: On --

MR. NOMELLINI: -- we're talking about.

MR. O'LAUGHLIN: Okay.

DJN-R Exhibit 1A, is that a depiction of a water delivery system that would service the Pak/Young parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Is that a delivery system that would service the Mussi parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: DJN-R Exhibit 1B: Is that a delivery system to service water to the Pak/Young parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Is that a delivery system to service water to the Mussi parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Okay. DJN-R X 1C: Is that a delivery system to the Pak/Young parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Is that a delivery system to the Mussi parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: DJN-R EX 1D: Is that a delivery system to the Pak/Young parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Is that a delivery system to the Mussi parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: DJN-R X 1E: Is that a delivery system to the Pak/Young parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Is that a delivery system to the Mussi.

MR. NOMELLINI: No.

MR. O'LAUGHLIN: DJN-R EX 1F: Is that a delivery system to the Pak/Young parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Is that a delivery system to the Mussi parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: DJN-R EX 1G: Is that a delivery system to the Pak/Young parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Is that a delivery system to the Mussi parcel?

MR. NOMELLINI: No.

MR. O'LAUGHLIN: Okay. Just got a couple more. Thank you for your patience, Mr. Nomellini. I appreciate it.

DJN-R EX 2: Is that a delivery system for irrigation water to the Pak/Young parcel?

MR. NOMELLINI: I think that could have been.

MR. O'LAUGHLIN: Okay. Is that a delivery system for irrigation water to the Mussi parcel?

MR. NOMELLINI: I think it could have been.

MR. O'LAUGHLIN: DJN-R EX 2A: Is that a delivery system to the Pak/Young parcel?

MR. NOMELLINI: I don't think so, but I'm not sure. You know, I would assume that that went in in 1923, and the Woods Robinson Vasquez went in about that time.

So -- and I think this was a new installation

because Widdows didn't say it was an existing site. So I'd say probably not.

MR. O'LAUGHLIN: Is that a delivery system to the Mussi parcel that's depicted in Exhibit 2A?

MR. NOMELLINI: Probably not.

MR. O'LAUGHLIN: Okay. I'm looking at -- is 2A the same as Exhibit 2B in the location?

MR. NOMELLINI: Same location, yes.

MR. O'LAUGHLIN: Thank you. So would your responses be the same?

MR. NOMELLINI: Yes.

MR. O'LAUGHLIN: Thank you.

I'm now on DJN-R EX 2C: Is that a delivery system to the Pak/Young parcel?

MR. NOMELLINI: I don't know. That's close to the Woods main irrigation facility, and at one time there may have been service over there to that area.

MR. O'LAUGHLIN: Okay. Is that a delivery system depicted in 2C to the Mussi parcel?

MR. NOMELLINI: Same answer.

MR. O'LAUGHLIN: Thank you.

You testified earlier that you had a kiln that was located on Middle Roberts Island near your residence; is that correct?

MR. NOMELLINI: That's correct.

MR. O'LAUGHLIN: Okay. If I understand your testimony correctly, you are of the opinion that the kiln was the source of bricks for the various brickworks that were described in your photos; is that correct?

MR. NOMELLINI: No. I used that to say that, you know, certainly prior to the 1900s those bricks would have been locally available.

MR. O'LAUGHLIN: Okay.

MR. NOMELLINI: There were other bricks available earlier.

MR. O'LAUGHLIN: And it's true that the bricks could have been available after 1900; is that correct?

MR. NOMELLINI: That's true.

MR. O'LAUGHLIN: Okay. So is there any way when you were out there looking at these bricks that you could detect a factory that made the bricks? Were they stamped?

MR. NOMELLINI: I didn't see any stamps, no.

MR. O'LAUGHLIN: Were there any date stamps on them? Like, you know, sometimes in concrete people will put a date and a date stamp. Did you see any of that on the bricks?

MR. NOMELLINI: I didn't see it.

MR. O'LAUGHLIN: Okay. So you have an opinion, but you can't specifically say the year those bricks

were made and installed; is that correct?

MR. NOMELLINI: Not the exact year, but the quality of the brick doesn't indicate a very modern brick.

MR. O'LAUGHLIN: Okay. That's an interesting statement. Are you now an expert on bricks too? I knew you were a renaissance man, but I didn't know you were an expert on bricks.

MR. NOMELLINI: Well, if you've been in my office, you will see the variant in the wall. It's an old brick building. It was built prior to 1880s or thereabouts.

And it has the differing qualities of the brick because it was expanded over a period of time, and there's definitely a difference. But I couldn't tell you the specific year.

MR. O'LAUGHLIN: Okay. Can you pull up -- you have a map by Mr. Hammonds. I think it's DJN-R Exhibit 16.

MR. NOMELLINI: I have it.

MR. O'LAUGHLIN: Okay. Did your staff determine if this was a draft map or the final map?

MR. NOMELLINI: I don't know of any such determination. I understand it was in the file as a supporting document for the Hammond Hall map.

MR. O'LAUGHLIN: Okay. Have you compared and contrasted this map to the Hammond map put in in the Wee testimony that's labeled Exhibit 43?

MR. NOMELLINI: Only insofar as I know that the words "Duck Slough" are in a different place.

MR. O'LAUGHLIN: Okay. Is the line that's depicted in the Wee map of Exhibit 43 for Hammond, does it run in a further southwesterly direction or a shorter southwesterly direction than the one shown in your DJN Exhibit 16?

MR. NOMELLINI: I can't tell you without looking at it. I don't remember.

MR. O'LAUGHLIN: Okay. If I were to inform you that this map that you presented to the State Board is a draft map, do you think that a draft map is more reliable to the State Board to rely upon or the final map?

MR. NOMELLINI: Well, if it's the same person making a draft and then producing a final?

MR. O'LAUGHLIN: Yeah.

MR. NOMELLINI: I would generally think the final would be better, but I don't know the background.

MR. O'LAUGHLIN: You talked about in your testimony -- and if you could pull a map or something that you feel comfortable with out of your testimony

about a trestle on the railroad running across what you believe to be Duck Slough. Just pick a map you feel comfortable doing that with.

MR. NOMELLINI: Why don't we take one of those aerials, DJN-R EX 23.

MR. O'LAUGHLIN: 23. Let me dig through your stuff and get to there.

I have DJN-R Exhibit 23, 1937 aerial photo, in front of me dated 8-13-37. Is that one you were --

MR. NOMELLINI: That's the one.

MR. O'LAUGHLIN: If we could throw that up on the screen?

MR. NOMELLINI: I don't have it in electronic form.

MR. O'LAUGHLIN: Ah, you don't.

MR. NOMELLINI: Do you want another one?

MR. O'LAUGHLIN: No, no, no.

What we could do is I'm going to have you mark on my exhibit where you believe the trestle is located.

Mr. Nomellini, I'm going to hand you my DJN-R Exhibit 23. I have a green marker, and if you would circle for us generally the location you're talking about, I would appreciate it.

MR. NOMELLINI: (Complying)

MR. O'LAUGHLIN: I'll mark this for

identification purposes as MSS number 7. Thanks.

MS. KINCAID: We're on 8.

MR. O'LAUGHLIN: 8. Would you agree with that Mr. Mona? 7 or 8?

WATER RESOURCE CONTROL ENGINEER MONA: MSS-R --

MR. O'LAUGHLIN: Thank you. R dash -- sorry for the --

MS. KINCAID: I'm pretty sure it's 8.

MR. O'LAUGHLIN: I'll mark it as 8. If we need to come back and clean it up, I hope the parties would indulge us in doing that.

For the record, had marked as DJN-R Exhibit 23, we've marked it as MSS-R-8.

On it, Mr. Nomellini, you've circled a green line where you believe the railroad trestle crosses Duck Slough; is that correct?

MR. NOMELLINI: Yeah. That's where I believe the railroad trestle is now and was when this drainage canal was put in. That may or may not be on the exact alignment of Duck Slough. In other words, I think this replaced the Duck Slough connection over to Burns Cutoff.

MR. O'LAUGHLIN: Looking at this map, where -- if I was to look at DJN-R EX 23 in relation to where you've drawn the green circle, can you maybe in --

MR. NOMELLINI: I can describe where --

MR. O'LAUGHLIN: No. I'm going to --

MR. NOMELLINI: Okay.

MR. O'LAUGHLIN: The descriptions don't help me and probably won't help the Board.

If you could put a blue line on where you believe the High Ridge Levee is located on this, starting at Burns Cutoff and running down to the railroad please.

MR. HERRICK: I would just ask for clarification of when? The High Ridge as of what date?

MR. O'LAUGHLIN: Any date you want, and tell me the date.

MR. NOMELLINI: Today.

MR. O'LAUGHLIN: Sure.

MR. NOMELLINI: I'm going to mark in blue where I think the High Ridge -- what we call High Ridge Levee goes down to the railroad.

MR. O'LAUGHLIN: Thank you, Mr. Nomellini.

So you have marked on MSS-R-8 on a blue line the current location of High Ridge Levee from Burns Cutoff to the railroad tracks, correct?

MR. NOMELLINI: I believe that's correct.

MR. O'LAUGHLIN: Thank you.

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CROSS-EXAMINATION OF MOORE BY MR. O'LAUGHLIN

FOR MODESTO IRRIGATION DISTRICT

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MR. O'LAUGHLIN: Mr. Moore, you had a photo exhibit showing the meanders along the Sacramento River. Can you put that up for me? I forget what exhibit number that is.

MR. HERRICK: R-20.

MR. O'LAUGHLIN: Thank you.

MR. HERRICK: I believe it's the second page.

MR. O'LAUGHLIN: You know what? That was R-19, isn't it currently on the screen? Go back.

MR. HERRICK: They're both 20.

MR. O'LAUGHLIN: Oh, are they both 20? Let's take -- sorry about that. Let's take the top photo first. Okay.

The location of this photo is at what island?

MR. MOORE: I believe that to be Sherman Island. The city there is Antioch.

MR. O'LAUGHLIN: Okay.

MR. MOORE: I could be incorrect in calling it Sherman Island, but it is either Sherman Island or very close to it.

MR. O'LAUGHLIN: All right. And in that

depiction, what is the geologic age of this portion of the Delta compared to the geologic age of the Delta on Roberts Island? Is this earlier or later?

MR. MOORE: It would be approximately the same time. They're all Holocene which is geologically considered recent. But recent geologically is less than 10- or 15,000 years.

MR. O'LAUGHLIN: Okay. Now if sea level rise started, and the bay and the tides started to move inland, this would be the first area that would get inundated, and then Middle Roberts Island would be later in time; is that correct?

MR. MOORE: That sounds correct.

MR. O'LAUGHLIN: Okay. I was looking at this -- I don't know on this map or this photo, looking at the island depicted in the middle, can you show me where there are any levees on that island?

MR. MOORE: I didn't see any levees on it.

The purpose of using this photo was at -- it's almost not improved. There are some boat docks and all on the south end. But I was looking for something that would indicate a comparable land situation prior to any manmade improvements.

MR. O'LAUGHLIN: Okay. If you could scroll down R-19 now. We can look at the Sacramento River.

Okay. Isn't it correct that in order to get these meanders and oxbows you have to have a gradient?

MR. MOORE: True. You have to have a significant flow of water. You don't have to have a real high gradient, but you have to have enough of a gradient for the water to flow; that's correct.

MR. O'LAUGHLIN: And you have to have a certain amount of velocity to do this as well, correct?

MR. MOORE: That's correct.

MR. O'LAUGHLIN: And you have to have a certain elevation; is that correct?

MR. MOORE: Well, the elevation doesn't matter. It's just the gradient that matters.

MR. O'LAUGHLIN: Okay. All right.

In the San Joaquin River system, on Middle Roberts Island in 1850, if Atwater is correct that that is tidal land, then what gradient or velocity is occurring in that area to create oxbows or meanders in the current in that time period?

MR. MOORE: I wouldn't know what the exact gradient is. It's low. But this gradient in this area is also very low.

MR. O'LAUGHLIN: What's the gradient in this area, if you know?

MR. MOORE: I don't know.

MR. O'LAUGHLIN: Okay. Do you know what the velocities are in the San Joaquin -- on the Sacramento River at or near Chico in relationship to what the velocities would be on the San Joaquin River in a tidal zone?

MR. MOORE: No, I don't.

MR. O'LAUGHLIN: Okay. What I don't understand, though, is if the San Joaquin River is entering into a tidal zone, how does the San Joaquin -- how does the velocity of the San Joaquin River cut channels or make levees if it has little or no velocity?

MR. MOORE: Well, I wasn't talking about the San Joaquin River in our example. Whether it's the Sacramento River, this was given as examples how -- what oxbows and meanders look like and the trends and patterns they leave behind when they do move as they mitigate.

That long horseshoe bend in the upper left that almost touches the end of the photo is a good example of where the river would be cutting the high bank on the left and be leaving meander deposits to the right of it.

That's what the example was.

But this gradient in this area would be slightly higher than the Duck Slough area of Roberts Island, but not a great deal.

MR. O'LAUGHLIN: Okay. If you could turn to number R-29.

CHIEF LINDSAY: And also, for the record, we were talking about just now the second paragraph in R-20 and not R-19.

MR. O'LAUGHLIN: Oh, thank you.

CHIEF LINDSAY: And I'm sorry; you want R-29?

MR. O'LAUGHLIN: Please.

CHIEF LINDSAY: Okay.

MR. O'LAUGHLIN: Looking at this map, I notice you put red in it. When were those sedimentary deposits laid down in time? In other words, were they laid down in 1850, 1800, 1000? 0? I mean when are those deposits put down?

MR. MOORE: I don't know the exact time. It would have been varying different times, whenever there was high water or potentially floods. Whether they were a hundred years or 500 years, I don't know the exact age.

MR. O'LAUGHLIN: So you don't know the age of the sedimentary soil that's depicted in there?

MR. MOORE: No, I don't.

MR. O'LAUGHLIN: Do you have any knowledge of what the relative age of those sedimentary soils would be vis-a-vis the -- what I will call the muck or the

marshland in relative time periods?

MR. MOORE: They would be younger than the marshlands and the peat and the muck, as you say, around it. They would be younger than that.

MR. O'LAUGHLIN: So younger, does that mean earlier in time? I know this is confusing.

MR. MOORE: More recent.

MR. O'LAUGHLIN: So the sedimentary soils would be more recent in time than the muck soils that occur; is that correct?

MR. MOORE: That's correct.

MR. O'LAUGHLIN: Okay.

Have you taken out and compared and looked at what Atwater's depiction of the tidal influences are on Roberts Island in 1850?

MR. MOORE: I didn't do that personally. Mr. Lajoie did. This exhibit here was from his testimony. I worked with Mr. Lajoie on that, but he was an expert on the tides and that was mostly his part of the testimony.

MR. O'LAUGHLIN: Can you point me to any exhibit that's been offered in any of these proceedings where the tidal extent of the tide lands in 1850 that are set forth in Atwater are depicted in any exhibit?

MR. MOORE: I'm not aware of those. I

personally could not do it.

MR. O'LAUGHLIN: Okay. Thank you.

Are you a soils expert or have any knowledge of soils in the relative datings of soils?

MR. MOORE: I'm not an expert. Just generally from my geology background, but I do not consider myself a soils expert.

MR. O'LAUGHLIN: Okay. Looking at this map, do you have any -- I notice it's all labeled in an area adjacent to Burns Cutoff running down in a southwesterly direction that we generally called the High Ridge Levee or Duck Slough. I notice you have that in red depicting sedimentary deposits; is that correct?

MR. MOORE: That's correct.

MR. O'LAUGHLIN: Okay. Do you now -- are you aware of a definition of a term called Columbian soils?

MR. MOORE: No, I'm not.

MR. O'LAUGHLIN: Thank you.

In Exhibit 31, you talked about historic features. One of the problems I'm having is what historic -- what does history mean to you?

Are we talking about the last 50 years, the last 500 years, the last 1000 years where these historic sloughs, meanders existed in the -- on Middle Roberts Island?

MR. MOORE: When we're talking the sloughs and all, I'm talking about the last less than a thousand years. Typically more like 200, 300 years.

MR. O'LAUGHLIN: Do you find any differentiation between the sedimentary deposits in the creation of Duck Slough and a historical chronologic -- historic chronology?

In other words, does areas that are depicted with sedimentary soils, did they come earlier in time and Duck Slough came later in time? Or do you know?

MR. MOORE: I'm not exactly following your question there.

MR. O'LAUGHLIN: Okay. Let me ask a different way.

Are the sedimentary soils that are deposited taking -- using the same processes, geologic processes, that created the sloughs?

MR. MOORE: For the most part, yes.

MR. O'LAUGHLIN: Okay. Thank you.

Okay, next. In regards to the Pak/Young calls, I have a couple quick follow-up questions. Do any of the calls ever say to the middle of Duck Slough?

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CROSS-EXAMINATION OF BLAKE BY MR. O'LAUGHLIN

FOR MODESTO IRRIGATION DISTRICT

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MR. BLAKE: This is Landon Blake. No they do not.

MR. O'LAUGHLIN: Is your -- isn't it correct that another proper reading of the testimony would be, or the exhibits, is that it depicts High Ridge Levee in the call both from the west and to the east as to the middle of the High Ridge Levee; is that correct?

MR. BLAKE: A portion of the call in the west Fisher deed mentions only High Ridge Levee; but because both of those deeds share a common boundary line and were created at the same time, I don't believe it's a correct process to consider that phrase on its own.

And furthermore, the east Fisher deed clearly identifies Duck Slough as part of the call through all of the sections from Burns Cutoff to Middle River.

MR. O'LAUGHLIN: Okay. In fact, it has to be, in order to take your tortured reading of the deeds --

MR. HERRICK: Objection; that's inappropriate. "Tortured reading of the deeds?"

CO-HEARING OFFICER BAGGETT: Yes.

MR. O'LAUGHLIN: Oh, sorry.

CO-HEARING OFFICER BAGGETT: Rephrase that.

MR. O'LAUGHLIN: I will.

CO-HEARING OFFICER BAGGETT: Strike.

MR. O'LAUGHLIN: In your reading of the deeds, isn't it that your insertion is you have to assume that Duck Slough runs all the way from Burns Cutoff to Middle River; is that correct?

MR. BLAKE: That's not an assumption, Mr. O'Laughlin. That's clearly stated in the east Fisher deed.

MR. O'LAUGHLIN: Thank you. Mr. Prichard.

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CROSS-EXAMINATION OF PRICHARD BY MR. O'LAUGHLIN
FOR MODESTO IRRIGATION DISTRICT

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MR. O'LAUGHLIN: You said these lands were drained for irrigation purposes; is that correct?

MR. PRICHARD: Yes. They were reclaimed so they could be farmed.

MR. O'LAUGHLIN: But I'm talking specifically about drainage. So let's take the Pak parcel. Do you know what methodology was used to drain the Pak parcel?

MR. PRICHARD: No, I don't.

MR. O'LAUGHLIN: Okay. Now one of the assertions in this case is that there is a Delta pool in

that, as water rises in the Delta, the hydraulics in the Delta create a water surface elevation underneath lands in the Delta. Do you agree with that?

MR. PRICHARD: That sounds reasonable.

MR. O'LAUGHLIN: Okay. Now how is it if the water surface elevation on a high tide is 3 feet, and if the Pak/Young parcel's at 0 feet, that the Pak/Young parcel ever drains?

MR. PRICHARD: Obviously, it's drained.

MR. O'LAUGHLIN: Well, no. I'm asking you -- the question's very specific.

How does -- if the Delta pool is correct, and the water surface elevation's at 3 feet and the Pak parcel is at 0 feet, how is it that the Pak parcel would drain?

MR. PRICHARD: There's a delayed time between the movement through the sediment to the other side. On the free water side, it will drain back, and it's impeded by the tortuous path through the soil.

MR. O'LAUGHLIN: Okay. Now where did the Pak parcel drain to?

MR. PRICHARD: I don't know that.

MR. O'LAUGHLIN: Do you know the depth of the channel that the Pak parcel drained to?

MR. PRICHARD: I don't.

MR. O'LAUGHLIN: Okay. Now if the Pak parcel is draining to a cut or slough or a drainage ditch, and if Mr. Nomellini is correct that there's water there -- there's always water in those ditches, then isn't it true that the water surface elevation under the property would always be as high as the water surface elevation in the canals or ditches or laterals?

MR. PRICHARD: I don't know the answer to that.

MR. O'LAUGHLIN: Okay. And what would lead you to believe the general hydraulics of having a water surface body that's adjacent to a parcel that has a water surface elevation of two that the land underneath the adjacent parcel wouldn't have a water surface elevation at two as well?

MR. PRICHARD: For the same reason I stated, is that if there is a difference in elevation, and there's a media in between it, meaning soil, that it could drain out in the inside while still having a higher head on the outside and still be drained.

MR. O'LAUGHLIN: Okay. Do you know if that's true for the Pak parcel?

MR. PRICHARD: Not particularly.

MR. O'LAUGHLIN: Do you know if that's true for the Mussi parcel?

MR. PRICHARD: No.

MR. O'LAUGHLIN: Okay. One of the questions that was asked earlier in a previous matter, and maybe you can testify to it better than Mr. Neudeck: Alfalfa. Are you familiar with that crop?

MR. PRICHARD: Yes, I am.

MR. O'LAUGHLIN: Okay. What is the typical root zone of an alfalfa crop? Is it 1 to 2 feet, 3 --

MR. PRICHARD: In the Delta? Would that be restricted to the Delta?

MR. O'LAUGHLIN: Just we'll go generally first.

MR. PRICHARD: It varies substantially depending upon the area or the depths of soil that can be explored that contains nutrients and water and air, meaning not saturated from the water table.

MR. O'LAUGHLIN: Okay. And so if the soil beneath it was saturated with water, the root zone would stop before going into the saturated soil?

MR. PRICHARD: That's correct.

MR. O'LAUGHLIN: Because if it went into the saturated soil, it wouldn't get anything from it?

MR. PRICHARD: Right.

MR. O'LAUGHLIN: Okay. So there is any reason to believe that alfalfa, if it was grown in the southern Delta, and the Delta pool existed where these hydraulics raised and lowered water on these lands, that alfalfa

would not be able to receive water from this Delta pool theory?

MR. PRICHARD: There's no doubt that if the roots were deep enough to contact the water table fringe area where the water table moves up into the root zone, there would be some use of that.

But generally speaking, that's relatively small. And therefore, to produce a commercial crop, one would want to irrigate that on a periodic basis so as to maximize your potential yield.

MR. O'LAUGHLIN: Okay. And since you're an expert on irrigation, how many days would it take between irrigations in order to have a viable alfalfa crop in the Delta?

MR. PRICHARD: It depends on the water-holding capacity of the soil and how much is applied each time. But generally speaking, there would be either -- in most parts of the Delta, it is a single irrigation between cuttings, and cuttings are about every 28 days.

MR. O'LAUGHLIN: Okay.

MR. PRICHARD: So typically it would be one, and sometimes it's two.

MR. O'LAUGHLIN: Okay. So I'm assuming that as conditions in the Delta warm up that April and May you can probably go longer; when you hit July and August,

the time period's shorter to apply water?

MR. PRICHARD: Well, you would want to time your irrigations for your harvest.

MR. O'LAUGHLIN: For your cuttings?

MR. PRICHARD: Yes.

MR. O'LAUGHLIN: Okay. So -- but as the hotter it gets, if you're going to have a viable crop, and as ET goes up, you probably have to either A, apply more water or apply subsequent water --

MR. PRICHARD: More frequently.

MR. O'LAUGHLIN: More frequently.

MR. PRICHARD: Yes.

MR. O'LAUGHLIN: Okay.

When you do an application in this area of the Delta, what is in your opinion the maximum amount of water that can be applied to be readily used by the plants on a 28-day rotation? Are you applying two inches, three inches, six inches?

MR. PRICHARD: To meet your full ET, given some system losses, you'd probably need to put about eight inches on it.

MR. O'LAUGHLIN: Thank you. I have no further questions. Thank you.

CO-HEARING OFFICER BAGGETT: Thank you.

MS. KINCAID: Valerie Kincaid, San Luis &

Delta-Mendota Water Authority. I have just two or three clarifying questions.

CO-HEARING OFFICER BAGGETT: Okay.

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CROSS-EXAMINATION OF NOMELLINI BY MS. KINCAID
FOR SAN LUIS & DELTA-MENDOTA WATER AUTHORITY

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MS. KINCAID: I have just a few questions, Mr. Nomellini. I think you went through a similar exercise with Mr. O'Laughlin, so I won't repeat it.

But there are some photos that you entered in as DJN-R Exhibit 8. I wanted to go through a similar exercise that Mr. O'Laughlin went through with you, but perhaps we can do it more quickly.

Can you identify out of those exhibits -- I think they are photo 7 through 16 -- if any of the structures pictured deliver water to the Pak or Mussi parcels?

MR. NOMELLINI: All of those Woods features -- maybe we ought to go through them individually.

MS. KINCAID: Sure. We can do that if you'd like.

MR. NOMELLINI: This photo 7 has that potential.

MS. KINCAID: Photo 7 has that potential.

MR. NOMELLINI: Yes, because it's part of the Woods system. And I believe that the Pak and Young and Mussi parcels may have been irrigated for a time through the Woods system.

MS. KINCAID: And what is your understanding based on?

MR. NOMELLINI: Well, I saw some references that indicated that those areas were kept in just for drainage. And originally, I think they were part of the Woods brothers holdings, and they had extensive irrigation in my opinion that was run prior to the Woods Irrigation Company being corrected, and I believe they would have used that system to help irrigate those parcels which they owned.

MS. KINCAID: So it's your understanding that even though those lands were marked drainage that they actually received irrigation; is that correct?

MR. NOMELLINI: Yeah, I think they marked them drainage because they had another system in at the time to give them irrigation, so they didn't want to pay for the cost of an irrigation service.

And I also think they were on the fringe of the Woods system, and maybe they were the last people to get service.

MS. KINCAID: To be clear, the drainage

discussion we're referencing comes from the 1911 Woods Irrigation Company agreements to furnish water; is that what you are referencing?

MR. NOMELLINI: I think they get drainage today.

MS. KINCAID: But when you discuss -- when I asked you before what evidence you have, you indicated that there are some -- there is evidence that there are drainage lands. Was the evidence you were referring to the 1911 agreements?

Or do you have other evidence that would indicate that these lands in the Woods system also were used to irrigate the Pak and Mussi parcels?

MR. NOMELLINI: Well, what I tried to explain is that I think they were part of the Woods brothers holdings, John Newton Woods and E.W.S. Woods.

MS. KINCAID: I understand that.

My question was: What supports that belief? Do you have -- can you point me to a document other than the 1911 agreements, which is what I assume we've been talking about, that supports that belief?

MR. NOMELLINI: Well, the documents I would point to are the deeds that show the Woods brothers owned all that land.

MS. KINCAID: Okay. And we can go through --

that was photo 7. Photo 8, you would say for same reasons that --

MR. NOMELLINI: That's that --

MS. KINCAID: -- part of the Woods system.

MR. NOMELLINI: -- interconnection gate between the two main Woods canals. And yes, my answer would be the same.

MS. KINCAID: And 9, 10 -- 9 through 16: Is your answer the same due to Woods --

MR. NOMELLINI: 9, yes. 10, yes. 11, yes. 12, possibly. That's not part of the Woods system, but it is nearby.

MS. KINCAID: 13?

MR. NOMELLINI: 13 is not part of the Woods system, but I think that supplied the -- or could have supplied the Duck Slough -- I'll call it slash High Ridge Levee system.

MS. KINCAID: Okay.

MR. NOMELLINI: Yes.

MS. KINCAID: These photos -- let's finish. 14, 15, and 16: Is your belief similar?

MR. NOMELLINI: 14 could have. That's in the Pocket Area. It's a little farther to the west.

MS. KINCAID: Okay. 15?

MR. NOMELLINI: 15, I think no. Because I

think that it's likely that the gate, since it was denoted by Charlie Widdows as being a proposed gate with a pump, cast more doubt on whether there was a floodgate there before.

They certainly could have supplied water from the system to that area.

MS. KINCAID: Okay. And 16?

MR. NOMELLINI: 16 is -- yeah. My answer would be yes on this one because that's part of the Woods system that goes down Stark Road.

MS. KINCAID: Thank you.

These Woods Irrigation exhibit photos, I believe it was your testimony previously that you took those photos; is that correct, Mr. Nomellini?

MR. NOMELLINI: That's correct.

MS. KINCAID: Did you take the photos that have been entered in as DJN-R Exhibit 2 and Exhibit 1?

Did you take those photos?

MR. NOMELLINI: Show them to me. I don't remember what --

MS. KINCAID: The photos you went over with Mr. O'Laughlin earlier.

MR. NOMELLINI: Oh. 2 and 1? I see what you're saying. Yeah. DJN-R Exhibit 2 -- yeah, those are photos that I took.

MS. KINCAID: You took those.

And DJN-R Exhibit 2 looks an awful lot to me like the same structure in Woods Irrigation Exhibit 13. Can you confirm that that is a picture of the same structure?

MR. NOMELLINI: I don't have 13, but this is a better picture of that same floodgate that I had in a previous exhibit. Whether it's that one or not, I don't know. I took it with a camera rather than my cell phone.

MS. KINCAID: I can provide you photo 13 just for reference.

MR. NOMELLINI: That would be helpful.

Yes, that's correct. It is the same as photo 13. Same gate.

MS. KINCAID: And do you see any changes between photo 13 and photo 2 that's up on the screen? It might just be the lighting but --

MR. NOMELLINI: If there was change, I didn't note it. But it is definitely the lighting is one of the changes. The camera picked up more light.

MS. KINCAID: Okay. Thank you.

MR. NOMELLINI: They were taken at different times.

MS. KINCAID: What time was the photo 13 taken;

do you recall?

MR. NOMELLINI: That was a number of weeks ago. And then the Exhibit 2, I think I took last Sunday.

MS. KINCAID: Just last week?

MR. NOMELLINI: Pardon me.

MS. KINCAID: Okay. Thank you, Mr. Nomellini. Mr. Prichard, I believe I just have one question for you.

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CROSS-EXAMINATION OF PRICHARD BY MS. KINCAID
FOR SAN LUIS & DELTA-MENDOTA WATER AUTHORITY

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MS. KINCAID: Your exhibit, I think that -- I have it as Exhibit B, but I believe it's in the 30s. Did we number that exhibit that you handed out, the map of -- the Gateway map overlying the Google Earth map?

MR. PRICHARD: 39.

MS. KINCAID: 39. Thank you.

In Exhibit 39, there are white lines that are labeled CA and then a number follows. Can you just explain for the record what those lines indicate?

MR. PRICHARD: Those lines are from the soil survey that show -- California Soil Association. In other words, there are a number of closely related series contained in those areas that are delineated by

those lines and those numbers, those CA numbers.

MS. KINCAID: So those lines indicate certain soils on the ground; is that correct?

MR. PRICHARD: Correct.

MS. KINCAID: Is there a body of soil data that exists that is more specific than these?

MR. PRICHARD: Yes, there is. As you -- when you place the soils map over Google, you have to be certain -- when you place a map, a soils map, on Google, you have to be at a certain resolution or certain closeness for the individual series to show up.

That's what I looked at when I came to my conclusions. However, upon reproduction of this, it was farther out to get the whole picture in, then it went just to the association.

But it is possible to view this at a higher resolution that shows the individual series. And typically these associations are made of between two and four series that are similar.

MS. KINCAID: And you did not provide another series. This is the only soil exhibit that you provided; is that correct?

MR. PRICHARD: That's correct.

MS. KINCAID: Thank you.

CO-HEARING OFFICER BAGGETT: Any questions from

staff? I have none. Exhibits?

MR. HERRICK: Yes, if I could have a couple recross?

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REDIRECT EXAMINATION OF MOORE BY MR. HERRICK

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MR. HERRICK: Mr. Moore, you were asked a number of questions about the necessity of velocity and gradient in order to create channels. Do you recall those questions?

MR. MOORE: Yes, I do.

MR. HERRICK: And you're generally familiar with the Delta, are you not?

MR. MOORE: Generally, yes.

MR. HERRICK: And there are a number of main channels in the Delta; is that correct?

MR. MOORE: That's correct.

MR. HERRICK: And those main channels are in the the tidal zone, are they not?

MR. MOORE: Yes.

MR. HERRICK: And the elevation of the water depends on inflow and tidal flow; does it not?

MR. MOORE: For the most part, yes.

MR. HERRICK: And notwithstanding those two different impacts, the downstream flow and upstream

tidal flows, channels are carved under natural conditions, are they not?

MR. MOORE: That's correct.

MR. HERRICK: And is there any difference between that and the carving of the channels on the islands with regard to how much velocity or gradient you need?

MR. MOORE: There's virtually no difference. It's the movement of the water, whether it's tidal influence or gravity.

MR. HERRICK: So if the tide's going out and there's a high flow, you could have the creation of channels on Delta islands before reclamation, correct?

MR. MOORE: Absolutely. That would create the velocity necessary to create the oxbows and meanders we see in the photos.

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REDIRECT EXAMINATION OF NOMELLINI BY MR. HERRICK

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MR. HERRICK: Mr. Nomellini, could you briefly explain to the Board how lands below sea level are drained, since it's apparently at issue here?

MR. NOMELLINI: Well, of course, you have the tidal fluctuation if you're depending solely on the tide gate. It's when the tide drops below sea level, as I

understand it. Mean sea level.

So you have tides that are lower, and you have tides that are higher. So if you are dependent on a floodgate, then you would close the gate, you know, after the tide went out to make sure it didn't come back up, and you'd get a net drainage out of that.

And of course we used pumps to remove water and maintain the water table. And they started using pumps, you know, late 1800s, thereabouts. Maybe a little earlier than that for drainage.

MR. HERRICK: And in fact, over the last 150 years, the lands that are or were below sea level have and continue to be drained; is that correct?

MR. NOMELLINI: Absolutely. They -- that's the purpose of some of these reclamation districts that I represent. Part of their function is to run the drainage system that keeps the lands drained so they can adequately be farmed.

MR. HERRICK: Are you aware of any landowners who had purchased land that was at or about below sea level and waited 50 years or 100 years before they drained it?

MR. NOMELLINI: I don't know of any in this area.

MR. HERRICK: Thank you. That's all I have.

Thanks.

CO-HEARING OFFICER BAGGETT: Any further cross from any of the parties? Recross?

MR. O'LAUGHLIN: None on behalf of Modesto Irrigation District.

MS. KINCAID: None for the Authority.

CO-HEARING OFFICER BAGGETT: Staff? Exhibits?

MR. HERRICK: With that, our rebuttal exhibits, Mr. Nomellini had DJN-R Exhibit 1 through 24, I believe.

Mr. Moore had exhibits R-20 through R-31 without there being an R-30 because we used the one for Mr. Nomellini, that same map.

Mr. Landon Blake had Exhibits 32, which was his testimony, through Exhibit 38.

Then Mr. Prichard had Exhibit 39.

And we would move those into evidence.

CO-HEARING OFFICER BAGGETT: Okay. Any objection? Mr. O'Laughlin.

MR. O'LAUGHLIN: Yes.

To the exhibits that Mr. Nomellini had testified that don't deliver water to Pak and Mussi, I would move to strike as irrelevant. Those were basically the photos that were shown in Exhibits 1, 2, and 3.

As to the ones he testified may have a

connection or did have a connection, I have no problems entering those photos.

MR. HERRICK: Mr. Nomellini's testimony was to support various conclusions made. He was not representing certain of those photographs as directly connected but as being evidence of the practices of the time. I don't see any basis for striking them.

If parties want to argue they don't prove anything, that's fine. There's no basis to strike them from the record.

CO-HEARING OFFICER BAGGETT: Objection's noted. Overruled. We'll admit them for I think the principle they were just illustrative of historic practices, not for specifics.

Anything else? Okay. They are admitted thank you.

(Whereupon various DJN-R Exhibits were admitted in evidence.)

(Recess)

CO-HEARING OFFICER BAGGETT: Let's go back on the record. Mr. O'Laughlin, you're up.

MR. O'LAUGHLIN: Thank you, Mr. Baggett.

We're going to break this up a little bit. Bear with us. Mr. Wee is here to testify on rebuttal. The first rebuttal that we're going to do is to the --

in regards to a Prosecution exhibit.

We ran into a labeling problem, so we're going to mark Mr. Wee as MSS-R then WEE, W-E-E. And this exhibit is number 74.

And the reason we did that is in the Woods matter Wee was 1 through 74 but we've already entered into Exhibits 1 through 8 here. So I don't want Exhibits 1 through 8 and 1 through 8 twice.

So this will be MSS-R WEE-74, and then we'll enter in the rest of Mr. Wee's rebuttal a little bit which will be MSS-R WEE, and that will be 1 through 73. Okay?

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STEPHEN R. WEE

Called on rebuttal by MODESTO IRRIGATION DISTRICT

DIRECT EXAMINATION BY MR. O'LAUGHLIN

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MR. O'LAUGHLIN: Mr. Wee, you've previously taken the oath of affirmation in this matter; is that correct?

MR. WEE: I have.

MR. O'LAUGHLIN: Okay. And I asked you to look at a map that was marked by the Prosecution Team as Exhibit No. 9 which was described as an 1870 tidal map. Is that correct?

MR. WEE: That is correct.

MR. O'LAUGHLIN: Okay. Did you have a chance to investigate as to the date of that map and any opinions and conclusions you can draw therefrom?

MR. WEE: Yes. I have looked into it, and I have drawn some conclusions.

MR. O'LAUGHLIN: Okay. And you have those set forth in MSS-R WEE-74 with Exhibit 74B and C attached?

MR. WEE: A, B -- the exhibits are 74A and B, 75, and 76.

MR. O'LAUGHLIN: Okay. Can you briefly summarize for the Hearing Team your findings and your opinions and conclusions please?

MR. WEE: Yes, I can.

Basically, my conclusion is that this map cannot possibly date to 1870, and it can be no older than 1877, and I'll give you my reasons.

The State Archives has a collection of 29 maps. This is one of them. And they're topographic maps, miscellaneous maps of the Secretary of State.

They are dated in a range from 1866 to 1877, but no single map is specifically dated or identified as to who the cartographer or producer of the map was.

My opinion is derived from basically two locations that are noted on the map, geographical

locations, neither one of which was present in 1870.

And if you refer to Exhibit 74A, you will see below Burns Cutoff a notation of a settlement called St. Catherines.

And then at the top of the map just to the left of the "Joaquin" in San Joaquin River, there is a partial name of another settlement. All you can read on this map is "field."

So I have provided in 74B, it's a black and white version of the same map, and it shows the full name of that other settlement which is Wakefield.

So we have two settlements here. The St. Catherines settlement was the home ranch of M.C. Fisher and was where he developed his, I guess you would call it, experimental or home ranch, headquarters ranch for the reclamation of Upper Roberts Island.

Mr. Fisher did not acquire the property until 1877, and it was his settlement there. So that precludes the possibility of the map being 1870.

Similarly, the town settlement of Wakefield was named after John Wakefield Ferris who was the manager of the Glasgow reclamation on Lower Roberts Island. And Glasgow acquired the land in 1877 as well. That was their experimental or home ranch.

So we have the two headquarters of the

companies that were reclaiming the island where they established farms where they could show the types of crops and things that could be grown on these two islands.

And I think I mentioned that Wakefield was named after John Wakefield Ferris.

So these two factors tell me that this map is not 1870. It's 1877 or later. And that means that the map is post reclamation of the island and is showing its depiction of Duck Slough and the High Ridge Levee on this island as just that: It's the High Ridge Levee, not Duck Slough as was testified extends down to Middle River.

MR. O'LAUGHLIN: Does that complete your testimony, Mr. Wee, on this matter?

MR. WEE: Yes, it does.

MR. O'LAUGHLIN: So if it's agreeable to the Hearing Officer, if we could have cross-examination on this specific point, then we'll get to the other rebuttal that Mr. Wee has that's a little bit more extensive in the Mussi/Pak matter.

CO-HEARING OFFICER BAGGETT: That's fine. Any from Prosecution?

MR. ROSE: I don't have any cross-examination for this witness at this time.

CO-HEARING OFFICER BAGGETT: Mr. Herrick, do you?

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CROSS-EXAMINATION ON MUSSI/PAK BY MR. HERRICK

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MR. HERRICK: John Herrick, Mussi and Pak/Young parties.

Mr. Wee, you've concluded that the map entitled 1870 tidal map which is PT-09 depicts Duck Slough at the -- in the area that -- in the area near Burns Cutoff but -- I didn't say that right. I'm sorry.

The line from Burns Cutoff down to Middle River you've described as being Duck Slough and High Ridge Levee; is that correct?

MR. WEE: That is correct.

MR. HERRICK: And you've concluded that since reclamation took place in between 1875 and 1877 and the High Ridge Levee was completed, that you therefore conclude the reference to Duck Slough is only to that I'll say upper portion of that line; is that correct?

MR. WEE: Well, that along with a whole lot of other evidence that I'm going to present.

MR. HERRICK: Yes. I didn't mean to -- but that's your conclusion. Did you consider that this was evidence to change your original conclusion rather than

your original conclusion necessarily means that Duck Slough is only that upper portion?

MR. WEE: Could you ask that question again?

MR. HERRICK: I was just posing this as sort of the scientific method: New evidence arises. Rather than saying your current evidence means that that can't be correct, did you consider that perhaps this was Duck Slough all the way, and therefore your earlier conclusions might be incorrect?

MR. WEE: My conclusions are based on a whole lot of research that I have done. And when I saw this map, I was skeptical that it was what was represented to be because it didn't match up with the historical evidence that I had.

So I decided to look into it and discovered that it wasn't what it was purported to be, and that's the explanation for why we have the High Ridge Levee showing on this map. Whereas if it was 1870, it would have -- this couldn't have been the levee.

MR. HERRICK: Mr. Wee, we have some other maps, and I'll just briefly mention one that comes to mind. The State Engineering Department's topographical and irrigation map of the San Joaquin Valley.

Do you recall that map and its -- the line on it designated Duck SL?

MR. WEE: Yes, I recall that.

MR. HERRICK: And that line goes partway to Middle River, not all the way. And I don't want to be pejorative, but it doesn't go all the way?

MR. WEE: That is correct.

MR. HERRICK: And is it your understanding that that line then shows part of the High Ridge Levee, Duck Slough, but not all of the High Ridge Levee then since the line doesn't go all the way to Middle River?

MR. WEE: You know, I can't explain why it doesn't go all the way there. I wouldn't think that an 1886 map it would.

MR. HERRICK: So -- but your conclusion is that the part that doesn't go all the way to Middle River must be a portion of High Ridge Levee and not a slough there; is that correct?

MR. WEE: Again, could you repeat the question? Could you repeat that? I'm not sure what you're asking.

MR. HERRICK: I'm just exploring your conclusion that a line on a map that you think represents the High Ridge Levee doesn't continue along the entire length of High Ridge Levee. And the map we were talking about was that State Engineer's map.

MR. WEE: Yeah. All of my historical research that I've done would indicate to me that the line that

is depicted on that map as it goes across the island, except for the first mile or two, is the High Ridge Levee.

MR. HERRICK: Excuse me. I forgot one thing.

Mr. Wee, I've handed to you a document that has five pages attached total. The top of it's labeled House of Representatives. It's apparently a letter from the Secretary of War to the Congress.

And I will not rush you here. It's not too much to breeze through the text. It's discussing potential dredging of Old River for navigation purposes.

Attached to that -- and again, take your time; I'm not trying to rush you. Attached to that is a map, and it shows that portion of the Old River that they propose to dredge with an inset map of the area.

And the following pages are a blow-up of the legend of the map and a blow-up of the inset map.

Now again take your time, but as I read this document, it's dated January 18, 1895. It talks about an engineer report of January 9, 1895. And there are other dates in there. But generally speaking, it's in the 1890s, it looks like.

And it's a report on how to and the cost of dredging of Old River.

Important for purposes here, and my questions

will deal with the description -- excuse me -- the blow-up inset map. And that map shows the area in question, I'll say. We can see Rough and Ready Island with the San Joaquin River.

And then it has a line coming off of Burns Cutoff traveling in the same direction as we've previously discussed Duck Slough slash High Ridge Levee.

Do you see that line on the inset map blow-up which is the last page of this document?

MR. WEE: Yes.

MR. HERRICK: Okay. When I show you this, do you have any opinion as to whether or not that is a representation of a waterway or whether it's a representation of a waterway and a levee or whether it's a representation of something else?

MR. WEE: It's not identified, and I really -- I looked over very quickly the text that you gave me, and I'm not sure what the, you know, intent is of the -- all of these lines.

It -- I'm not disputing that there was a Duck Slough and that it ran off of Burns Cutoff. And that's -- this is in the approximate location of where that slough is represented on early maps.

This map is substantially after the chronological time frame of the original reclamation.

MR. HERRICK: And if indeed this information is from the mid 1890s, that would be some, what, 15, 18 years-ish after High Ridge Levee was completed on Roberts Island; is that correct?

MR. WEE: Yes.

MR. HERRICK: And if someone were trying to indicate a levee on this inset map running from a Duck Slough down to Middle River, would you not expect them to have the line go all the way to Middle River rather than stop?

MR. WEE: I do believe that if they were depicting the levee in 1894 it would run all the way to Middle River.

MR. HERRICK: If this were a depiction of a waterway, as you said, it does follow generally the line of Duck Slough that's been discussed here before. I'll get to the length in a minute. But you -- I believe you said that it generally follows that Duck Slough line; is that correct?

MR. WEE: Well, the Duck Slough line in the pre-reclamation maps -- when I say pre-reclamation period, I mean 1850 to 1875 -- would have turned to the southeast rather than continuing in that southwest projection.

So it doesn't show the same configuration as

the maps that I've seen in the pre-reclamation period.

MR. HERRICK: So if you believe that the Duck Slough actually turned to the southeast after a certain distance off of Burns Cutoff, do you have any opinion as to what the remainder of the line on this map is that would be below or southwest of where you believe Duck Slough would have turned?

MR. WEE: Well, I'm looking at some of the other sloughs on this map that -- I mean, by this time many of these sloughs had been extended by canal cuts, and whether or not that's what's represented here is an extension that's artificial, I don't know.

But it does extend further than what is shown on the pre-reclamation maps.

MR. HERRICK: Lastly, in your testimony on page 2 in the bottom paragraph starting just about in the middle, you say:

> This would also be consistent with C.D. Gibbes' 1875 observation that there was no slough present at the intersection of the High Ridge and Middle River.

And it goes on there, but that's the end of the quote I'm making. Do you see that quotation?

MR. WEE: Yes.

MR. HERRICK: Now is that correct? Did Mr.

Gibbes make a statement or observation? Or is it just that there's no reference in his materials to such a slough?

MR. WEE: Oh, no. He was very clear.

He said there were two and only two open sloughs on Middle River, and neither one was at this location.

MR. HERRICK: So you're referring to his statement of the two sloughs he did identify. Does he not mention later that those were the only undammed sloughs?

MR. WEE: The only open sloughs, yeah.

MR. HERRICK: Okay. Thank you. That's all I have. Thank you.

MR. RUIZ: Mr. Herrick, did you identify this exhibit?

MR. HERRICK: I have not. I will make it -- to get the right number --

MR. RUIZ: I think it's 40.

MR. HERRICK: I believe it's R-40.

And again, the original exhibits I started with had Mussi in front of them, but we'll consider these for both. I believe this testimony is also for both cases.

Thank you.

CO-HEARING OFFICER BAGGETT: Thank you.

Prosecution, do you have any questions? I already got you. Staff? Okay.

MR. O'LAUGHLIN: Does Central Delta or South Delta or San Joaquin have any questions?

MR. RUIZ: Central Delta and South Delta don't have any.

MR. O'LAUGHLIN: Okay. Now we're going to move on to the second part. This is testimony regarding Mussi/Pak. And these exhibits are marked MSS-R WEE, and they're going to be 1 through 73.

And I -- Hearing Officer Baggett, we had extensive testimony, direct testimony and cross-examination testimony, of Exhibits 12 through 55 in this.

So we're not going to spend a lot of time with that. We'll generally try to touch upon those points. But that direct and rebuttal took place in the Woods Irrigation Company matter.

So we'll try to blow through that pretty quickly and hit the high points in regard to the specific cases of Mussi and Pak and Young.

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FURTHER DIRECT EXAMINATION BY MR. O'LAUGHLIN

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MR. O'LAUGHLIN: Mr. Wee, you have provided

your curriculum vitae in this matter previously; is that correct?

MR. WEE: I have.

MR. HERRICK: And you took the oath?

MR. WEE: Yes, I have.

MR. O'LAUGHLIN: And you have prepared testimony, rebuttal testimony, that's depicted in MSS-R 1 through WEE -- MSS-R WEE 1 through 73; is that correct?

MR. WEE: Yes, that's correct.

MR. O'LAUGHLIN: Can you briefly summarize your testimony in regards to the Mussi and Pak Young matters please?

MR. WEE: This testimony was -- my written testimony was a rebuttal of Christopher Neudeck's testimony in the Mussi and Pak Young matters, and I have organized this testimony into four parts.

The first part has to do with Mr. Neudeck's review of mapping and title issues that Mr. Blake has supplemented today.

First of all, I would like to talk about one of the foundational deeds for Middle Roberts Island where the Mussi parcel is located. It was talked about a little bit today by Mr. Blake.

That document is the conveyance by J.P. Whitney

to Morton Fisher dated January 15, 1877.

This is for a large parcel of land that is bordered on the north and the west by -- to Duck Slough and High Ridge Levee. It's the northern end of the Upper Division of Roberts Island.

Now, in that deed, the -- this boundary line along Duck Slough and the High Ridge is identified, and I'd just like to quote from the deed. It says that they're conveying land lying south and east quote:

> Of the levee constructed along High Ridge and Duck Slough from the branch of the San Joaquin River known as Burns Cutoff to Middle River.

Now when I read this construction of this particular part of the deed, it's plain to me it's calling to a levee. And it's calling to a levee along Duck Slough and a levee along the High Ridge.

This levee had just been built the year before. So it's a clear demarcation of the northern land that was reclaimed by Mr. Fisher at the time.

There's nothing really ambiguous about it. I just read it as -- he's not saying that the High Ridge and Duck Slough are coterminous. It's that they are two different geographical features that have a levee built along it, and they're describing the boundary line to

the levee.

Now that interpretation is consistent with all the other deeds that I've seen that describe to the High Ridge Levee and the west side or east side of the High Ridge Levee with relationship to the chain of title for this property.

As to the severance of the property, this large parcel we're talking about that's owned by Whitney and Fisher and Stewart, was riparian to the San Joaquin River, to Burns Cutoff, to Duck Slough, and to Middle River.

But in 1891, when Stewart transferred the property to Joseph L. Vasquez -- and this is exhibit -- that deed is Exhibit 6 -- that conveyance of 149.5 acres severed the parcel from all the waterways.

And it's useful to note that the description of that parcel describes it as bordering and lying east of quote:

> A cross levee separating the middle and lower divisions of said Roberts Island.

And it does not mention a slough or Duck Slough.

The assessor's maps from this same period around 1891, which are my Exhibits 7 and 8, identify that boundary on the -- the boundary on the west side of

this parcel as a levee.

And if you move to Exhibit 9, another contemporary map, this one of the Stockton-Bellota Drainage District. It's dated -- this is three years after this transfer, 1894.

And if you would turn to Exhibits 9D, you can see it. And then on 9E and F are all blow-ups.

And what they show is that Duck Slough is depicted as running a couple miles inland as two parallel solid lines. And to the north of those lines, all the way from Burns Cutoff all the way down to Middle River, is a dashed line.

That dashed line is the levee.

Duck Slough does not go any further than a couple miles inland. And I would point out the dashed line that's the levee connects up with levees along the San Joaquin River, Burns Cutoff, Middle River -- everywhere on this map where you see a levee, it's a dashed line.

And Duck Slough does not extend as far as the Mussi parcel or Pak/Young parcel.

I'm going to move ahead into the section of my testimony where I talk about the historical background of Duck Slough and High Ridge Levee, this Exhibits 12 through 55 that I'm just going to try to highlight the

main points here.

Mr. Neudeck in his testimony had argued that because blue lines appear on the county assessor's maps that this is an indication that Duck Slough extended all the way from Burns Cutoff to Middle River.

And I point out in my testimony, if you look at Exhibits 13A, B, 14, 15, they all are the surrounding townships that were also in 1876 assessed by the San Joaquin County Assessor, and all of those waterways are not blue.

And on top of that, many of the sloughs that are shown are named, and there's no name applied to the blue line across the map, the 1876 assessor's map, for T1N, R5E.

If you look at my Exhibit 16, what I've done there for you is to -- I prepared a table. And I've looked at all of the assessor's maps from 1876 to 1919 looking for blue lines along the High Ridge Levee. And you can see the results there.

There's only a couple of years where a blue line is shown. Out of 40-some maps, we have two or three examples of a blue line. The other 37 I believe do not have a blue line.

And moreover, many of these years, the majority of them, the structure running along what I call the

High Ridge Levee is identified by the assessor as a levee, either a levee or cross levee.

And the way in which that levee is depicted in comparison to other levees on those maps is the same, is consistent. I don't know what else you could conclude.

I think that that's a very important part of my conception of the historical research and was to try to, best as I could, to look at the situation in the historical period where we have historical documents, and I'd say 1850 is the date of the Swamp Land Act, when we became a state. Seemed like a good starting place, and that's where the map evidence also starts.

And that period, pre-reclamation period, would run to 1875 when the work was started on the High Ridge Levee and enclosing the rest of Upper Roberts Island.

That would give us the best picture of what the natural conditions were on the island as best we could do from map evidence that's available.

In my research I found three -- well, I found several maps that predate 1875, but many of them did not have Duck Slough on the map.

I only -- I found only three maps that showed a slough location of Duck Slough. And those three maps, one was drawn by a commander in the US Navy in 1850, and that is Exhibit 17.

The second one was a map developed by the very reclamation company, the Tideland Reclamation Company, that owned Roberts Island at the time and was at least thinking or beginning to think about reclaiming it. That map is map 18.

And third is the General Land Office prepared a plat map of what they called the notoriously swampy and overflowed section of the Delta. That's 1872. That's map 19.

Each of those maps, although not exactly the same, are generally consistent. And they all show Duck Slough running about a mile or two inland from Burns Cutoff in the southeasterly projection and then abruptly turning to the southwest and filtering out into the channels and into the tules.

The alignment does not follow the High Ridge Levee, the root of the High Ridge Levee, except for that first mile or two, the extreme eastern side.

There's been previous testimony by Mr. Neudeck about the reclamation process on Roberts Island or the reclamation process in general which he then extrapolates and uses those generalities to talk about what might have happened or must have happened on Roberts Island.

And he cites to John Thompson's dissertation,

Study of the Settlement Geography of the San Joaquin Delta from -- written in 1957.

My strategy was a little different. I decided to actually try to do the research to figure out what happened specifically on this island in this place.

And so I set about trying to find out when the island was reclaimed, what methods were used, how it was done, and what kind of tools were used, what kind of methods were used to form the levees.

And my conclusions are very different than what Mr. Neudeck had believed and what he surmised from John Thompson's study.

Essentially what the historic evidence shows is that this particular island was not reclaimed with the extensive use of dredges, but rather it was built with plows and scrapers and road-building types of equipment from the period, scrapers being pulled by horses and by Chinese with wheelbarrows and hand tools.

This is important because we've heard a lot about the way that the levee was constructed on both sides of Duck Slough, that there were two levees, that there was -- there was a channel that was created.

But that's not the way these levees were built. These levees were built up by plowing the earth and mounding it up on an existing high ridge.

And I think it's key, I guess, to go into some detail on the plan of reclamation on this island.

We have a newspaper article I was going to point you to, Exhibit 21, which is a fairly detailed explanation of the -- by the person who was in charge of developing the plan of reclamation for Mr. Whitney in 1875.

And he describes his route around the island, looking at it, assessing it for a reclamation plan he wanted developed.

He notes that on the lower -- on the upper part of Roberts Island there were only two open sloughs. He -- neither one of them is at the location of the High Ridge. They are far to the south and to the east.

In terms of describing the High Ridge, he describes it as -- he went up it at least three miles, and he describes it as being two to three feet above the surrounding territory, being as wide as 300 or 400 feet of sedimentary soil.

It's that soil next to that natural ridge that was plowed and then scraped up to form the levee.

It wasn't done by a dredger. There wasn't a Duck Slough there to send the dredger down and to take, you know, buckets of muck out of the bottom of the slough, then put it on top of the levee.

There wasn't -- Duck Slough wasn't there but a mile or two.

And the rest of it, the way they built it was the way I'm describing. Some dredgers were used briefly near the mouth of Duck Slough and along the Burns Cutoff in the San Joaquin River, but they did not build the cross levee.

One of the other, I guess, highlights of -- that I'd like to hit on is that, as I've explained, Duck Slough did exist during this period.

Part of the reclamation of the island was to cut off Duck Slough. And in fact, in 1876, the people that were reclaiming the island built a levee across the mouth of Duck Slough and installed a tide gate in it. And --

MR. O'LAUGHLIN: What exhibit number?

MR. WEE: If you refer to Exhibit 36, it describes the tide gate they put in. And I'm just going to read a quote from that article from a pertinent part.

This is from the Stockton Daily Independent, October 11, 1876. They're talking about the work as being done at Burns Cutoff and Duck Slough. And they say quote:

> A large force of Chinamen are at work filling the gap on Burns Cutoff and

building the earthen dam at the mouth of Duck Slough. Two self-acting floodgates 3 feet square and 40 feet long have been put in near the dam at low water mark and are so arranged that when the tide falls lower than the level of the water inside the gates will open and drain off. Whenever the water on the inside rises higher than that on -- excuse me -- whenever the water on the outside rises higher than that on the inside, the gates will close and shut it out.

So they're talking about gates that were installed that promoted only drainage of the island. The gates didn't work both ways.

MR. O'LAUGHLIN: Can we go off the record for a second?

(Discussion off the record)

MR. WEE: I touched upon the pertinent parts of my testimony having to do with construction of the levee, so I'm going to move on to part four of my written testimony which is a discussion of the Pak/Young parcel.

Basically, the Pak/Young parcel lies -- is on land that lay north and west of the Cross Levee. So

we're on I guess what would be termed at that time the Lower Roberts Island.

That parcel was included in a large conveyance that was made also by Whitney to Morton C. Fisher. The land was up north and west of the Cross Levee all the way up to the San Joaquin River.

The language that's used in this deed is pretty telling also. It is a little more specific about what sections of the -- the sections along the levee Duck Slough was on and what sections the High Ridge was on.

It conveys land in quote:

> Section 1 and 12 --

And that is 1 North, 5 East.

> -- lying west of the San Joaquin River, Burns Cutoff, and Duck Slough. The fractional part of Sections 13, 14, 22, and 27 lying west of the High Ridge Levee which extends from Burns Cutoff to Middle River.

I think there it's a little clearer that we're talking about Duck Slough part of the way and the High Ridge Levee part of the way. And again, it's calling to the levee along those features.

The land north and west of the High Ridge Levee was conveyed, again, in 1877 to the Glasgow California

Land Company who held that property into the 18 -- mid 1890s.

That parcel was contiguous to Burns Cutoff, San Joaquin River, Whiskey Slough, Duck Slough. It took in that whole northern part of the island.

The portion of that land that includes the Pak/Young parcel was conveyed to John N. Woods and E.W.S. Woods in November of 1896. That deed is Exhibit 58.

Prior to the conveyance to the Woods brothers a year earlier, the Glasgow California Land Company sold off from its holdings the parcel that later became known as the Pocket. And that Pocket is the parcel that was riparian to Middle River.

So when Glasgow sold to Frank E. Lane and E. Thomas Hood, they effectively severed themselves from Middle River.

The next year, they sold a parcel that -- sorry; I don't have the acreage on it -- but they sold a parcel to the Woods brothers.

That parcel then, which had already been severed from the Middle River, was severed from all the other watercourses making it nonriparian, noncontiguous to any stream.

The other I guess significant thing to mention

is that, if you look at the property description in that deed from Glasgow to the Woods brothers, they do not mention Duck Slough as a boundary. They also call to the levee, to the High Ridge Levee.

MR. O'LAUGHLIN: That completes the summary of his direct rebuttal testimony.

CO-HEARING OFFICER BAGGETT: Thank you. Prosecution?

MR. ROSE: We have no cross-examination.

CO-HEARING OFFICER BAGGETT: Mr. Herrick?

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CROSS-EXAMINATION BY MR. HERRICK

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MR. HERRICK: John Herrick, for Mussi and Pak and Young.

As we were saying off the record, as we've done prior in this, I will incorporate my cross-examination from the Woods proceeding on Mr. Wee as most of that dealt with all the same documents, testimony without overstating it.

So I'll incorporate that, and just have some follow-up questions now.

MR. O'LAUGHLIN: We have no problem with that, and we'll just get the specific reporter's transcript pages so that the record will be clear to what that was.

CO-HEARING OFFICER BAGGETT: Very good. Appreciate that.

MR. HERRICK: I do not know those pages as yet.

Mr. Wee, you testified with regard to the deeds from Whitney to Fisher -- the two deeds from Whitney to Fisher as they related to the Mussi and the Pak and Young properties; do you recall that?

MR. WEE: Yes.

MR. HERRICK: And you'll excuse me if I get this backwards as I go through it, but I believe the deed for the Pak and Young parcel calls out Duck Slough for two sections and then calls out High Ridge Levee for the remainder of the sections of the property line we're talking about; is that correct?

MR. WEE: It calls out two sections that border on the San Joaquin River, Burns Cutoff, and Duck Slough.

I'm not sure that Duck Slough is in Section 1. It mentions Sections 1 and 12. And I'm not sure if Duck Slough actually is in Section 1. Certainly Burns Cutoff and San Joaquin River are.

MR. HERRICK: Yes, but I think he's referring to the lands of Section 1 that go over onto Duck Slough, I think. Regardless.

MR. WEE: Well, what he's doing is describing the boundary of the tract as it lies along the San

Joaquin River, Burns Cutoff, and Duck Slough.

And he's saying that that, those three features, are in Sections 1 and 12 and that his -- their property lies west of that.

MR. HERRICK: That's correct.

And the call is to the west of -- I'm going to leave Burns Cutoff; that's a question -- but the call is to the west of Duck Slough and then the west of High Ridge Levee for the remainder of the sections; is that correct?

MR. WEE: Yes, that's correct.

MR. HERRICK: And then for the Mussi deed and the chain -- I said that wrong.

And then the Whitney-to-Fisher deed in the Mussi chain calls out sections and then says along High Ridge Levee/Duck Slough, correct? It doesn't separate out what section might apply to what feature; is that correct?

MR. WEE: Yeah. It says High Ridge and Duck Slough, yes.

MR. HERRICK: So the point of the question was: It doesn't separate out any sections as to one or other of those features.

MR. WEE: That is correct.

MR. HERRICK: Now, that deed talks about lands

east of what they call out as High Ridge Levee and Duck Slough, correct?

MR. WEE: Yes. South and east, yes.

MR. HERRICK: So by your interpretation of those two deeds, is there a gap of ownership between someone who owns everything to the east of High Ridge and Duck Slough and someone who owns everything to the west of High Ridge?

MR. WEE: I take this -- I read this, and I think the subsequent deeds bear me out that they run to the center of the levee so that one is the west part, the other one is the east part.

And I don't think they say from the -- I don't believe they say from the base of the levee or anything like that. They just say east and west.

MR. HERRICK: But one of the deeds calls out Duck Slough too, and that's the east of Duck Slough. So do you have an opinion as to whether or not the transfer of the lands to the northwest of the Duck Slough/High Ridge feature included parts of Duck Slough and not parts of Duck Slough? Or who got the Duck Slough --

MR. WEE: Yeah --

MR. HERRICK: -- where the other call is to the east.

MR. WEE: Well, the one deed makes it very

clear that the call is to the levee constructed along High Ridge and Duck Slough. So we're talking about the levee is the line.

The other one is maybe -- well, it says Duck Slough, San Joaquin River, and to Burns Cutoff. And I believe that at that time -- well, that would have been just about the time the levee was being finished there at the mouth of Duck Slough.

I took that to mean that they were adopting the same line, being the levee along Duck Slough which was on the north or, say, west and side. So that that would have put Duck Slough in Middle Roberts Island -- or Lower Roberts island.

MR. HERRICK: That answer gets back to my question, which is: If the call for the northwest side is everything west of the ridge and the call to the southeast side is everything east of Duck Slough and High Ridge, doesn't that leave a gap as to who owns whatever part of Duck Slough, wherever it exists?

MR. WEE: No.

MR. HERRICK: It does not?

MR. WEE: No.

MR. HERRICK: Okay.

Mr. Wee, you've made a number of conclusions with regard to the interpretations of surveys and deeds.

Do you have any surveying experience?

MR. WEE: I'm not a surveyor.

MR. HERRICK: Do you have any experience in the interpretation of old deeds using different surveys to interpret them?

MR. WEE: I have -- for 30 years, I've been looking at deeds and doing this kind of work, so I'm very familiar with them. And I've done some reading along the way. But I have no formal training as a surveyor or in the use of surveying instruments.

I don't consider myself an expert on survey techniques.

MR. HERRICK: In your testimony, you state that -- excuse me for one second please.

I'll move on. See if I can come back to that.

Mr. Wee, have you had a chance to examine one of the exhibits Mr. Nomellini presented which is a Hammond Hall map or a map from the Hammond Hall papers he listed as DJN-R Exhibit 16?

MR. WEE: Yes, I saw this this morning.

MR. HERRICK: And you're aware just from the exhibit that the index in the records -- the index of this indicates that -- puts a date on it of circa, c-a, sometime around 1870, I believe it says.

MR. WEE: I believe it's 1880.

MR. HERRICK: 1880, correct. I'm sorry.

Now 1880 would be after the completion of the High Ridge Levee; is that correct?

MR. WEE: Yes.

MR. HERRICK: And this map shows a line running from Burns Cutoff generally in a southwesterly direction along what we've been discussing as the line of Duck Ridge (sic) and High Ridge Levee, correct?

MR. WEE: Yes, it follows the line of High Ridge Levee, as far as it goes.

MR. HERRICK: And just because of the weird shapes, we can recognize that the line goes beyond the little turn there that we know as the Mussi property, correct?

MR. WEE: Yes.

MR. HERRICK: But it does not go all the way to Middle River, correct?

MR. WEE: That is correct.

MR. HERRICK: This map has Duck Slough written more in the middle of that line rather than closer to Burns Cutoff; is that correct? I don't mean to overstate that, but.

MR. WEE: It's in the middle, yes. It -- the label is more in the middle of the line than on the other maps which show it up or near Burns Slough --

excuse me; Burns Cutoff.

MR. HERRICK: And the label of Duck Slough is -- or isn't it -- farther than the one or two miles you have identified as Duck Slough's extent?

MR. WEE: Yes, I believe on the -- yeah. I mean the extent would be somewhere near where the "S" is in island. If I can -- that would be in Section 14. So yes, it is beyond that point.

MR. HERRICK: Now if someone were estimating the length of a slough, they might draw a line that might not be coincident with the complete extent of the slough, correct? Unless they've done an actual survey?

MR. WEE: I -- are you -- I don't think someone would purposely misrepresent what they believed it was. I don't really understand your question, I guess.

MR. HERRICK: Well, I didn't mean purposely. I just meant unless somebody's actually surveyed the very end of every finger channel that goes off a waterway, they might draw a line to a certain point believing it goes to that distance, but that might not in fact be the actual exact end of the slough or tributary waterway, just as a general rule.

MR. WEE: Well, that would be speculation. I think that they would probably try to draw it.

MR. HERRICK: Now if somebody were trying to

draw a levee, and the levee connected to both Burns Cutoff and to Middle River, would there be any reason that you know of that they would only draw part of the line rather than the whole line?

MR. WEE: I don't understand what this map is showing because we know that the levee had been built by this time by copious other historic documentation.

One would have to speculate to try to explain the deviation on this map, and I don't have an explanation for you.

MR. HERRICK: Well, could one possible explanation be that Duck Slough went farther than your original conclusion but that, depending on the size or the interest of the person making a map, they either did or didn't include that representation?

MR. O'LAUGHLIN: I'm going to object; calls for speculation.

MR. HERRICK: I think I can give a hypothetical. If he doesn't think he can answer it, that's fine.

CO-HEARING OFFICER BAGGETT: Overruled. Answer it. Do your best.

MR. WEE: I mean there could be -- if you want to speculate, there could be any number of things one could speculate.

Could it be that the island flooded at the time these people were out there and it wiped out the levee so they're not showing it? That would be an explanation. You know. That's just speculation on my part.

MR. HERRICK: That's correct. That would be a possible explanation.

So now through this and our previous cross, we've shown you two maps, one dated approximately in the 1895 area and this one dated approximately 1880. Both of those being after the construction of High Ridge Levee, but both of those show a line going along the Duck Slough/High Ridge Levee line that does not reach Middle River.

Would you take that to mean that there's some other explanation other than it's Duck Slough?

MR. WEE: Yes. I -- all the evidence that I have seen, the discussion that I have seen about the natural waterways that existed at this point in the island, would not show me that Duck Slough extended down that far.

We -- and I also believe that the historical evidence shows that a levee did exist that attached to Middle River.

So again, I could speculate for you. But it

would be speculation as to why it's showing that a watercourse, be it artificial or natural, that extends that far down the island.

MR. HERRICK: That's fine. Thank you.

On page 19 of your testimony, you're talking about historic irrigation drainage practices. Page 19.

MR. WEE: Okay.

MR. HERRICK: On the label, the photograph 13, the second paragraph of that, it says beginning on the one, two -- third line at the right:

> A high ridge was built up in geologic or prehistorical times.

Are you saying there that you believe the High Ridge Levee feature -- the high ridge feature was not connected to any waterway that was continuing to build up that feature?

MR. WEE: Yeah. I am saying that in the historical period, which I'm saying starts in 1850 for my purposes, that there was no watercourse, that the high ridge existed, and that there was no watercourse adjacent to it except for where I say Duck Slough was that mile or two off of Burns Cutoff.

I don't believe that there was any -- I think that if there was a waterway it was adjacent to that high ridge. It was present in prehistoric or geologic

time, but not in the historical time frame.

MR. HERRICK: Couple things. Did you say built up pre -- I'm sorry. Did you say 1850 or pre-reclamation? I'm sorry.

MR. WEE: Prehistoric.

MR. HERRICK: But I thought then you said meaning before 1850 or something?

MR. WEE: I said when I refer to a historic period, I'm saying that -- I'm defining that as being in 1850 for the purposes of this discussion.

MR. HERRICK: Okay.

So is it your opinion then that on this portion of Roberts Island, pre-reclamation, there was a mound there with no channel going through the middle of it? Running down the middle of it?

MR. WEE: There was a ridge, not just a mound. I mean a mound, I think of something that's, you know, circular in nature, something that's contained, that type of a feature.

MR. HERRICK: That's a better correction.

MR. WEE: This is a ridge. And your question was do I believe --

MR. HERRICK: You believe there was just a ridge running along here and there was no channel down the center or center-ish of that?

MR. WEE: That's what I believe, yes.

MR. HERRICK: So some stream in the past built up a ridge and didn't leave a remnant of the waterway that created it? Is that your conclusion?

MR. WEE: Yes. There was no surface stream adjacent to it.

MR. HERRICK: Not adjacent, but running through it?

MR. WEE: No. Not running through it, no.

MR. HERRICK: Okay. So how did it get built up, do you know?

MR. WEE: Well, what I'm saying, it could have been -- would have had to have been some sort of ancient body of water in geologic time or prehistoric time.

But that body of water was long gone by the historic period -- or was gone by the historic period.

MR. HERRICK: Would that body of water had necessarily required a channel which runs through the center or the middle of that feature?

MR. WEE: When it existed, it would have had the channel. But it no longer existed. It filled in.

MR. HERRICK: It got filled in during the time that this was a swampland?

MR. WEE: I don't know the geological process. I'm just saying I see no evidence of it.

I know that the ridge had to be built up by the movement of water at some point in time, but the ridge could be very old. And in the historic period, the -- and the people that were out there observing the high ridge feature in the 1870s, nobody mentions a slough adjacent to that.

Even when they talk about Duck Slough, they do mention Duck Slough, but they qualify it and say it only ran inland to Honker Mound which was two miles inland from Burns Cutoff.

So I mean that's eye-witness observers in the 1870s stating that. And you have the person who is planning the reclamation in the mid 1870s who says this high ridge exists, that it's 400 feet wide and -- 300 to 400 feet wide -- and he is going to cut off the sloughs. He's going to reclaim the island. He doesn't mention a slough running through the middle of that?

I just don't find that credible.

He does not mention a slough, and he specifically enumerates two sloughs and no more, and neither of them are at this location. So that to me is pretty strong evidence.

MR. HERRICK: Well, he doesn't mention dammed sloughs. Only the open sloughs; is that correct?

MR. WEE: Yes, but Tucker also confirms that

this was a high ridge and does not mention a slough either and identifies where Duck Slough was.

MR. HERRICK: Getting back to my question: So your conclusion that there's no slough through this is not based upon geological evidence; it's based on your review of the historic record. Is that correct?

MR. WEE: Yes. I would say that the historic record is what confirms the nonexistence for me.

MR. HERRICK: That's all I have.

Thank you very much.

CO-HEARING OFFICER BAGGETT: Thank you. Any other party have any cross? Exhibits?

(Recess)

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JACK MEYER

Called on rebuttal by MODESTO IRRIGATION DISTRICT

DIRECT EXAMINATION BY MR. O'LAUGHLIN

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MR. O'LAUGHLIN: Mr. Meyer, have you taken the oath in this matter?

MR. MEYER: No, I have not.

CO-HEARING OFFICER BAGGETT: Do you promise to tell the truth in these proceedings?

MR. MEYER: I do.

CO-HEARING OFFICER BAGGETT: Thank you.

MR. O'LAUGHLIN: Mr. Meyer, we've had marked as MSS-R-9 a copy of your curriculum vitae with attached figures attached to that; is that correct?

MR. MEYER: That's correct.

MR. O'LAUGHLIN: Is that a true and correct copy of your c.v.?

MR. MEYER: It is.

MR. O'LAUGHLIN: Can you summarize for the Hearing Team your testimony in this matter and go through the figures that are attached as MSS-R-9 please.

MR. MEYER: I'll give it a try.

I'd like to present the Board with a little prehistoric perspective on the evolution of Lower Roberts Island and the landscape there over the past several thousand years.

Specifically, I'll try to show how the timing and extent of sea level rise has affected the Duck Slough area over the last two millennia.

To do this, I'm going to use five independent lines of evidence.

One is the now ever-familiar Atwater maps of the Lower Roberts Island area; a 1941 soil map which predates the 1952 map that's been used; a high resolution digital elevation model produced by the USGS for purposes of understanding absolute elevation within

the Delta; more than 200 radiocarbon dates from Delta peat and marshland deposits; and some prehistoric archaeological data in an effort to emphasize the spatial and temporal relationships between what's known as High Ridge and Honker Ridge and the Duck Slough area itself.

So if we can begin with the first exhibit there, figure 1, we'll see --

MR. O'LAUGHLIN: Just a second.

MR. MEYER: There we are.

So we're looking at the familiar portion of Roberts Island overlain on the USGS topographic maps, portion of the Holt and Stockton West quads.

We've simply overlaid in the blue hatchered area there the extent of the tidal wetland mapped by Brian Atwater in the 18 -- as of 1850. He didn't map it in 1850, but that's where he thought it would have been in 1850.

I've also added a red dotted line that follows the course of what's called Honker Ridge and what's called Duck Slough just for reference here.

And the point here is to show that even Mr. Atwater believed that, as of 1850 at least, the high tide generally did not affect most of Honker Ridge and -- but did have a complete influence over the Duck

Slough area.

So figure 2.

Now this is -- yeah. You want to pull it up a bit so we can see those same features again.

This is a 1941 soil map, a portion of a soil map of the entire Delta area that was produced by University of California soil scientist Stanley Cosby.

And the thing to note here is basically it looks complicated, but there's two different color soils out there, the green ones and the tannish brown ones. Okay.

The green ones are alluvial soils as he defines them, or mineral soils. And others there are for the most part organic and mixed soils. In other words, there's a little bit of both there.

But those darker hatchered ones with the EM symbol on them are in fact peat or marsh deposits as such.

So essentially what we're looking at there is confirmation of Atwater's 1850 line. You can't have peat unless you've got the sea in far enough to get the job done, so you could see a good correspondence there between those two.

MR. O'LAUGHLIN: And can I ask you, what does EM stand for?

MR. MEYER: EM is the name of a soil type called the Egbert muck. Egbert muck.

MR. O'LAUGHLIN: Okay. And I notice right next to the EM there is a depiction that says RY. What's that?

MR. MEYER: That's the Ryde series soil, R-y-d-e.

Then also you notice a green, light green shade in the Duck Slough area. And that is the Columbia soil. And thankfully Mr. Cosby gave us something of a time sequence on these soils because he was out there mapping these and looking in the ditches, looking in the canals, and he recognized that the oldest of these soils is the Egbert muck and that the -- these are overlain by the Ryde series soils, and that those are overlain by the Columbia series soils which are the lightest green ones.

And generally they just occur in places like Duck Slough, a little bit over around the Holt area and up around the Stockton area there at the confluence of Burns Cutoff and San Joaquin River.

Now in my work, I have learned that Columbia soils basically is code for hydraulic mining debris. So those sediments, those soils as such, generally were not deposited until some time after gold mining began and hydraulic gold mining particularly was under way in the

1860s through 1870s.

MR. O'LAUGHLIN: I have another question. If Duck Slough ran all the way from where your circle is on this map and ran all the way along what you've depicted on the red dot line and was hydraulically connected to Burns Cut, would you believe that that area, if it was a slough and was hydrologically connected, would contain Columbia soils?

MR. MEYER: I would expect it to had it been active and open to serve as a collection basin for soils. In other words, there were other places like Duck Slough that managed to get Columbia soils, but somehow they didn't get deposited along High Ridge at all.

MR. O'LAUGHLIN: Thank you.

MR. MEYER: Next number 3 --

MR. O'LAUGHLIN: Before we go, can we go back one? You said that Cosby gave us some timing of these. Do we have a timing mechanism to know -- you said the Columbian soils seemed to be around 1849.

Do we have a time sequencing for the Ryde soils and the Egbert muck or the ones that are labeled EM?

MR. MEYER: We do indirectly based on some of the radiocarbon data that I show later. Now I can --

MR. O'LAUGHLIN: Okay.

MR. MEYER: -- get into details, but we'll get there.

MR. O'LAUGHLIN: Thank you.

MR. MEYER: Yeah.

Number 3. Okay. DEM, digital elevation model. These are in this case a high resolution map created by examining aerial photographs and other datums to produce a map of absolute elevations at a resolution of about one meter vertically and at a resolution of about 20 meters horizontal.

So in other words, anything that's at least that big is going to get picked up by this model. And the USGS produced this. It's available online. Coons et al 2008 is the source of this.

Now, all we've done here is taken that data and colorized the elevations for you so that you can see what's above sea level and what's below sea level. Okay.

So -- and I've also got the Atwater 1850 tidal line on there for reference.

So what's below sea level? It's the purple and the blue.

What's -- and blue is only 1 meter, down to 1 meter, about 3 feet. And the purple is greater than 1 meter, greater than 3 feet.

The green is 0 to 1 meter above sea level, in other words, 0 to 3 feet. And the yellow is 3 feet or greater. Okay.

Again, look at the correspondence between Atwater's Delta line there, the high tide line, and these elevations and the continuity of the Honker Ridge levee ridge there.

Now notice that as you follow the ridge from Middle River north and towards the Duck Slough area that it takes a turn to the north and northwest there.

The high ground essentially continues onto the north and northwest down Inland Drive. It doesn't turn to the right and go down Duck Slough.

Okay. So we'll come back to that point here shortly.

The next please.

So how do we get from a digital elevation model to place time on that map? Well, there's a lot of good chronological evidence from the Bay Area. It's one of the best-studied bay estuary systems in the entire world.

I've accumulated a little more than 300 radiocarbon dates from the Bay itself and also from the Delta region. More than 200 of these dates in fact are from tidal marsh deposits within the the Delta proper,

and another about 73 are from the Bay margins, the remainder of the San Francisco Bay estuary.

If you put them all on a chart, this is what it looks like. So what you've got here is a sea level curve. On the right is 11,000 years ago. On the left is the elevation between 0 and negative 40 meters below sea level.

What this tells you is that there used to not be a San Francisco Bay, and there used to not be a Delta. They're relatively recent geologic features.

Next please.

So to produce a rate of sea level rise, I found that the dates from estuary deposits had greater variability and were generally unreliable compared to the tidal marsh deposits.

And the reason for that is because tidal marshes can only grow in a relative narrow band generally between high tide and low tide, and they have a hard time surviving in other zones. They can't grow higher, and they can't grow lower.

So tidal marsh deposits are great timekeepers, and they're great placekeepers in terms of elevation because they have to be pretty close to where the sea used to be in order to be there at all.

So if you line them all up and plot them --

here I've done it just over the last 7200 years, and I used a least-squares regression trend -- not that anybody cares -- second-order polynomial fit to determine the rate of sea level rise there.

The blue arrow there is showing you where the low portion of Duck Slough lies with respect to this sea level rise curve. This model.

So what you can see is that beginning about 2000 years ago a portion, at least, of Duck Slough appears to have come under the influence of the tide.

Next please.

To be fair and take the noise out of the system, I further refined the curve by taking all of the dates per every 1000-year interval, determining what the standard deviation and the elevations were, dropping everything greater than one standard deviation, and then replotting the curve to more accurately determine the rate and vertical extent of sea level rise.

Again, I show you there in blue where Duck Slough lies in relationship to this curve, again, pretty close to 2,000 years ago whether you want to take the minimum standard deviation, the maximum standard deviation, or the mean.

That -- again, that's based on 275 tidal marsh dates.

Next.

Let's zero in on the last few thousand years here. We're just looking at 0 to 3,000 years across the top there, left to right, looking at about 2 meters above sea level to 8 meters -- I'm sorry -- 6 meters below sea level there on the left. Okay.

What I've done is, using digit elevation model data, I followed -- we created a transect from Burns Cutoff up Duck Slough to the point where it meets Atwater's 1850 tidal line, and we did the same thing along Inland Drive along the remainder of the -- what's called High Ridge Levee or Honker Ridge.

That's in orange at the top. The blue at the bottom is the elevation across the majority of the Duck Slough area there. You can see it lies well below sea level.

And the blue there is an attempt to show the kind of minimum/maximum envelope in which this land began to come under tidal influence, again as early, if you take one standard deviation, as early as 2800 years ago, but certainly by approximately 800 to a thousand if you take a look at the minimum standard deviation range there.

Next.

So what does all this mean for Duck Slough?

Well, now we can take that same digital elevation model and we can show you where -- approximately where the sea was at different times in the past.

So what we have here in colors in the upper left corner in kind of the blue is approximately where sea level was 3,000 years ago coming onto the south and east into the Duck Slough/Inland Drive area.

The green demarks the area where the sea was approximately 2,000 years ago, and in yellow approximately where it had arrived by a thousand years ago.

So essentially everything that is now called or was called Duck Slough was already under peat marsh by probably about 2,000 years ago, and certainly it was by a thousand years ago.

So how do you get that ridge to form over there at the left? That's been a question that keeps coming up.

Well, while I was sitting, waiting, listening to all of this tremendous historical accounts of various kinds, I went back to an old article by Brian Atwater called History of Land Forms and Vegetation of the estuaries, tidal marshes that he did back in 1979.

In the abstract, there is one sentence and it reads:

Tides, rather than upland tributaries, created most sloughs around the bay, but riverine floods erected natural levees.

That is probably the single-most important distinction that needs to be made here. And in doing so, I believe the combination of the elevation model, the timing of sea level rise, the placement independently of me of where the tide was in 1850, and the fact that there's a prehistoric site sitting on the top of Honker Ridge suggests to me that the ridge came first and the marsh came second.

And what's the significance of that?

Well, if that ridge was formed by a channel -- and I agree, it was -- I don't know how else you get one of those unless a channel's doing the work -- it had to do it a while ago because the gradient was essentially progressively decreasing through time, becoming shallower and shallower for that stream, whether it was Middle River, San Joaquin River, call it what you want, it finally died a slow death.

That's what levee ridges are. They are dying streams. They are not healthy ones.

Healthy streams incise and cut channels and don't have to spit out levee deposits. Sluggish ones do. This is the death of a stream channel here.

Okay. Next.

So let's zoom into that area in question there between -- this is figure 9. So we're looking at the very tip of Brian Atwater's extent of what was not part of the marsh there along the upper end of Honker Ridge.

We're looking at a continuation topographically and in a sinuous meander, as pointed out by Mr. Moore earlier, onto the north and west along Inland Drive, not to the right, and northeast along Duck Slough.

Again, the other aspect of this is that it's a little difficult to live in an active channel whether you're a white man or whether you're an Indian. We have Native Americans living on High Ridge somewhere between a thousand years ago and 500 years ago based on the artifact types that are showing up there.

MR. O'LAUGHLIN: Can I interject right there?

MR. MEYER: Yeah. Go ahead.

MR. O'LAUGHLIN: With the sensitivity with Native American Indian sites and everything, we don't want to get into an open public description of the Indian site.

But needless to say, he has located it. The artifacts have been dated. It's all been recorded and logged. We -- I don't know how you feel about it. I mean I just don't want to talk about it a lot publicly,

disclosing Indian sites in the Delta.

But we have the information. We can provide it to you if you need it or the other parties do.

We'd like to in some way, shape, or form make sure that it's not public and that it's not disseminated.

Please. Thank you.

MR. MEYER: It is state law not to publicly disseminate the location of archeological sites. So let's not do that.

MR. O'LAUGHLIN: Right.

MR. MEYER: That is also the approximate location -- maybe I'm wrong -- of -- it was earlier pointed out perhaps to be Honker Mound? I'm not sure.

In doing the records search for this project, there are no previously recorded prehistoric sites out there. I went out and found that one.

But there are three mounds somewhere on Roberts Island that were originally identified by Stockton School Superintendent James Barr around the turn of the century.

So they're out there somewhere, at least three of them. This may be one of the three. Okay. So let's move on.

Let's go to number 10.

So now this business about channel levees necessarily having to have active streams or be active runways for water, of course, is erroneous. There's plenty of examples all around California of what we call levee ridges, channel ridges, call them what you like, that have been produced by stream activity, sometimes very brief stream activity.

Often it's equivalent to a levee blow-out, a splay event.

In this case, you're looking at Brian Atwater, his map of the Marsh Creek fan on the east side of the Delta. This fan has the Delta as its baseline.

And so what we're looking at here is a very similar circumstance to the kind of levee formation that may have occurred down on Roberts Island prehistorically.

You'd be hard-pressed to try to find anything riparian out there today and probably even in 1850.

And then one more example of the same kind on the next figure.

From Dixon. This is Solano County, so today Interstate 80 goes just north of Dixon. There's the old railroad tracks.

The old maps -- this is a 1908 map -- actually has a thing labeled called Dixon Ridge. And that was

only one of many levee ridges created by Putah Creek prehistorically. I actually excavated a prehistoric site one of those ridges in order for them to build a development in Dixon.

So they're out there. They don't necessarily have active channels in them. We might be able to dig around and find evidence of a channel. I'd be happy to radiocarbon date it if you like.

But otherwise, these things are natural features that occur widely around California, certainly not unique to the Delta region.

MR. O'LAUGHLIN: In looking at figure 11 -- in fact, the Putah Creek -- is Putah Creek the stream that forms these various old prehistoric stream channels you see here?

MR. MEYER: It's the major -- these are part of the Putah Creek drainage system, in other words.

Putah Creek is the major player in the area, and it lies north of here, and the Delta is to the southeast of this map. So you can see the direction of flow here essentially.

MR. O'LAUGHLIN: So prehistorically, at one time, these may have been stream channels from Putah Creek, but in a historic time from 1850 on they are no longer conveying surface water in the active channels?

MR. MEYER: Yeah, that's right. They are proof that channels live and die, and they can live and die relatively rapidly. These are streams that underwent a birth and a death.

MR. O'LAUGHLIN: Okay. Do you have any theory -- in looking back at your figure 1, it appears in figure 1 that the San Joaquin River has created a levee or embankment on the west side; is that correct?

MR. MEYER: Yeah, that's how I interpret that.

MR. O'LAUGHLIN: Okay. Do you have an understanding of why an area depicted in -- labeled Honker Slough appears to be heading in a north direction into the middle of the marsh?

MR. MEYER: Well, I would have to speculate about that.

MR. HERRICK: Mr. Chairman, can I -- I'm sorry. The question dealt with I think you said Honker Slough, Tim.

MR. O'LAUGHLIN: I'm sorry. Thank you, John.

Honker Ridge. Labeled in white with an orange dashed line.

MR. MEYER: Right.

Let me make an observation I think all of us can probably agree on. That is that when we're looking at the high ground levees of active channels like the

one that has formed along the San Joaquin there to the right, they run parallel.

They are the companion. They run alongside. They don't necessarily go at right angles unless you've got a levee splay.

Presumably the Honker Ridge is the approximate location of a prehistoric channel that formed that levee that presumably was able to do that before the sea had encroached that far southward into the Roberts Island area.

Otherwise it would be very difficult to explain how it could have formed with little or no gradient. Because those kind of features are not forming today.

MR. O'LAUGHLIN: So based on your carbon dating, that would have been at least 2,000 years ago; is that correct?

MR. MEYER: I would say -- I haven't dated it; I'd be happy to -- that the archaeology tells us that you can't live on top of a land form unless it's there.

So the archaeology dates somewhere between 500 and 1000 years ago, so it could be old as a thousand, minimum. Could be older than that. One way to find out would be to go out and stick a shovel in the ground.

MR. O'LAUGHLIN: And one other thing I want to note on your figure 2, briefly: Down in the lower

left-hand corner you have non-tidal zone circa 1850. There's those little green deposits. Are those Columbian deposits too down there along the lower left-hand --

MR. MEYER: Along the portion of Middle River, yes.

MR. O'LAUGHLIN: Okay. Thank you.

And does that conclude your summary of your testimony?

MR. MEYER: That concludes my summary.

MR. O'LAUGHLIN: Thank you very much, Mr. Meyer.

We're done.

CO-HEARING OFFICER BAGGETT: Prosecution have any cross?

MR. ROSE: No cross for this witness.

CO-HEARING OFFICER BAGGETT: Mr. Herrick, what's your --

MR. HERRICK: If the Chair would give us just five, ten minutes to review for cross?

CO-HEARING OFFICER BAGGETT: Anyone else have any cross? Why don't we give you 15 minutes, come back. 4 o'clock, we'll come back on cross. How is that?

MR. HERRICK: Thank you.

(Recess)

CO-HEARING OFFICER HOPPIN: Are you ready?

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CROSS-EXAMINATION BY MR. RUIZ

FOR CENTRAL DELTA WATER AGENCY, SOUTH DELTA WATER AGENCY

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MR. RUIZ: Good afternoon Mr. Meyer. Just looking at your resume, sir, you've got a master's degree. Do you have a PhD as well?

MR. MEYER: No, sir.

MR. RUIZ: As far as your formal training --

CO-HEARING OFFICER HOPPIN: Mr. Ruiz, before you go forward, in chronological order, we should have offered first opportunity to Mr. Rose and then to Mr. Herrick.

If there are no objections, we'll leave you where you are, but as a matter of courtesy I should ask Mr. Rose and Mr. Herrick.

MR. ROSE: I got confused. I thought I said I have no cross for this witness, but it could have been any other witness. I have no cross.

CO-HEARING OFFICER HOPPIN: Mr. Herrick.

MR. HERRICK: We'd originally intended to have Central Delta and South Delta go before me out of order.

CO-HEARING OFFICER HOPPIN: Thank you for knowing what was going on, Mr. Ruiz.

MR. RUIZ: So in terms of your formal training, it appears you're a geologist -- or rather an anthropologist. Is that a correct statement?

MR. MEYER: Yeah. Cultural resource management specialist is sometimes the term.

MR. RUIZ: Okay. You have to forgive me. You've presented quite a bit of information, and a lot of the questions are simply trying to understand your testimony.

So I kind of want to start with: What was your assignment in this case?

MR. MEYER: Well, I was asked to have a look at the area and from a prehistoric perspective. I'm in the business of prehistory. And was simply asked to let you all know what I knew about the area with the evidence I could bring to bear and a data sets I have that might have a bearing on our understanding of landscape change in this part of the Delta.

MR. RUIZ: Are you referring specifically to the Pak/Young and Mussi parcels? Or are you speaking of the Delta in general?

MR. MEYER: I don't even know anything about those parcels except they're out there somewhere. I care about the big picture, not the little picture.

MR. RUIZ: Have you done work in the Delta in

the past?

MR. MEYER: Yes.

MR. RUIZ: Have you done work in the Delta with respect to this specific area in regard to the Pak and Young Mussi parcels and Roberts Island in general?

MR. MEYER: No.

MR. RUIZ: What other parts of the Delta have you done work in?

MR. MEYER: Just to the south in the Mossdale area on I-5. I have done work on Terminus Tract. I've done work on portions of Discovery Bay Area on the Contra Costa County side.

I've done work on the Mokelumne -- mouth of the Mokelumne River and the area upstream on the Cosumnes.

And as part of a larger regional study, I actually have studied the entire Delta region.

MR. RUIZ: Okay. I asked you what your assignment was, and I understand that -- I haven't seen and don't see a written summary, which is not required, but I'm having a difficult time trying to understand what your conclusions are.

Maybe we can go through some specific exhibits, and you can help me understand what they are. But from a general standpoint, do you have some specific conclusions that you could state for me at this time in

terms of the result of your efforts with respect to this matter?

MR. O'LAUGHLIN: Other than the ones he's already stated in his direct testimony?

MR. RUIZ: Other than the ones he's stated in this direct testimony. And even in the ones he stated in his direct testimony, I'm still -- I am not understanding what they -- what his conclusions are. So we can go through them exhibit --

MR. MEYER: Why don't you ask me a question, and I'll try to answer it.

MR. RUIZ: Let's go to your figure 1. Do you have your figure 1?

MR. MEYER: Yes.

MR. RUIZ: Okay. And I'm looking at -- you've got Honker Ridge you've indicated here, and you've got Duck Slough with the orange hyphenated depiction.

MR. MEYER: Mm-hmm.

MR. RUIZ: Are you indicating or trying to indicate or suggesting that there is not a connection between Honker Ridge and Duck Slough? Or that sometime there was a connection that was lost? What are you tying to depict specifically on this figure?

MR. MEYER: Well, actually, all I was trying to do was orient us to the geography here.

I didn't make the USGS map, and I didn't make the 1850 border around the tide line. That's Brian Atwater.

All I did was highlight the area of interest which, as I understand, is this Honker Ridge/Duck Slough portion. That was the main intent of this and just to show the relationship of these landscape features to the rest of the world.

MR. RUIZ: Thank you.

Now moving over to the -- I think I just referred. That was figure 1. Moving over to your figure 2.

MR. MEYER: Mm-hmm.

MR. RUIZ: Again, you've got the Duck Slough depicted, and you've got Honker Ridge, and then here you've also got different soil types.

Starting more generally, looking at this figure, what was your intention or conclusions with respect to this figure?

MR. MEYER: Well, my intentions were essentially the same as the person that made it, was to try to distinguish between organic soils and alluvial soils and, in doing so, make a distinction about the distribution of depositional environments because certain soil types can only form under particular

settings, and this case we have an organic setting. We have alluvial setting.

So it was really simply to point those two main soil types out, and again in relation just spatially to our other landscape feature, Honker Ridge and Duck Slough.

MR. RUIZ: Okay. Thank you.

In your process of determining or putting together this exhibit and indicating the different locations, in your view, of the soil types, you went through your testimony and it was, you know, rather summarily, and can you explain to me the process you used for reaching your conclusions in terms of where these soils exist on this figure?

MR. MEYER: Well, I didn't conclude where these soils exist. The mapper did. All I'm doing is showing them to you so you can decide for yourself.

MR. RUIZ: Okay. Well, what specific maps did you look at, what did you utilize in order to put together this exhibit?

MR. MEYER: Well, I used the 1941 Cosby soil survey of the Sacramento-San Joaquin Delta, which I can give you the whole map if you like.

MS. KINCAID: For the record, that Cosby map was handed out. It is directly behind figure 2 in

everyone's packet.

I don't believe that Mr. Lindsay has it to put up on the board, but everyone else who has a packet should have it included in their materials directly behind the figure 2.

CO-HEARING OFFICER HOPPIN: Thank you, Ms. Kincaid. Do you see it, Mr. Ruiz?

MR. RUIZ: I'll find it. I don't see it at this time, but.

MS. KINCAID: Very colorful.

MR. O'LAUGHLIN: This one, right behind it.

MR. RUIZ: Okay. I was thinking of a report.

MR. O'LAUGHLIN: Just another map.

MR. RUIZ: Going over to your figure 4 Mr. Meyer --

MR. MEYER: Mm-hmm.

MR. RUIZ: -- you've got the chart that you've created. It looks to be radiocarbon dating.

Can you help me understand what you're trying to show in this exhibit, in this figure 4?

MR. MEYER: Yeah. It's really quite simple.

It's an x/y graph where x is time and y is elevation relative to mean sea level. So folks like myself, they find deposits that they'd like to know how old they are, we can go back and determine their exact

elevation. An independent lab does the radiocarbon dating. They tell us how old it is.

So all I've done for you here is plug these dates back into their absolute elevations specifically for tidal marsh dates from San Francisco Bay and the Sacramento-San Joaquin Delta in such a way as you and I hope most of us can see the progressive rise in sea level over the past 11,000 years.

MR. RUIZ: With respect to this matter, the matter that we're here for, the Pak and Young and Mussi matter, I'm trying to understand how the work you did here on this figure in terms of showing the rise in sea level, how do you link that -- or what is your opinion as to how that pertains or relates to the Pak and Young and Mussi parcels?

MR. MEYER: Well, I think it's self-explanatory myself because --

MR. RUIZ: Well, I appreciate that you may think that, and that's your field, and I'm glad that you do. I don't think it is, and I'm just asking you if you could explain it to me.

MR. MEYER: I'll give it a try.

My first figure shows a good deal of --

MR. O'LAUGHLIN: Wait, wait. Figure 1.

MR. MEYER: Figure 1.

MR. RUIZ: Going back to figure 1?

MR. MEYER: Yeah, let's go back to figure 1 for a moment.

The reason I started with that figure was again to get us all oriented to the fact that much of the the area that we are interested in here appears to be or have been within the tidal zone by 1850.

If tidal, then it's got something to do with the ocean, right?

MR. RUIZ: I believe so.

MR. MEYER: Yeah. Then that means we can try to understand where the ocean was at different times using radiocarbon dates.

The purpose of that is to know -- basically, we already know this. I'm just bringing it to light for the -- for this particular case -- that the sea has not always been where it was.

So when did it arrive? And where was it within Roberts Slough any one period of time?

The way to do that is to carefully assemble as much relevant data as possible -- in this case, the radiocarbon base -- determine their absolute elevations, plot them, let that tell you when the sea was at a certain elevation, and then that gives us the advantage of actually creating a map that shows us where the seas

and tides essentially would have been at any one time in the past.

MR. RUIZ: Okay. And you link that specifically to -- well, I think you said Roberts Slough, but I think you're referring to Roberts Island.

MR. MEYER: Roberts Island.

MR. RUIZ: As far as --

MR. MEYER: Well, it's true for the entire Delta. The linkage is for the entire -- it's a global phenomenon. It's not restricted to the west coast.

MR. RUIZ: Then moving over to your figure 5.

MR. O'LAUGHLIN: Figure 5.

MR. RUIZ: Yes.

MR. MEYER: Yeah. Here I've just -- I'm showing you the actual statistical regression fit that helps us determine more definitely where the sea was at one time.

Obviously you can see there is variability in the elevation of particular samples at any one point in time.

So in order to arrive at a -- since what we're interested is mean, is a mean, mean sea level, let's figure out what the mean is. And we've done that here essentially using a polynomial fit trend of the available data.

So again, these are on tidal marsh deposits. This tells us approximately what their elevation was at what time in the past.

And this is a necessary step if one is going to create any kind of an accurate map, knowing where the sea was at any one time in the past, whether it's in the Delta region or elsewhere in the world.

MR. RUIZ: And on the left side of your figure here, you've got Duck Slough, lowest elevation --

MR. MEYER: Yes.

MR. RUIZ: -- minus 2.

What are you specifically indicating with that depiction.

MR. MEYER: That is -- that is one of the prevailing low points across much of the area. The area that is called Duck Slough is at that elevation according to the digital elevation motel.

MR. RUIZ: That was my next question. So according to the digital elevation model, can you elaborate a little further on that, how you arrived at this being supposedly the negative 2 elevation here?

MR. MEYER: Well, I didn't, but the USGS did.

And my figure 3 in the lower left-hand corner of the colored area actually provides the entire reference. It's available online free off the internet.

You can read all about it. And you can download the GIS files and map it yourself if you like.

MR. RUIZ: Moving over to your figure 8, Mr. Meyer.

MR. MEYER: Mm-hmm.

MR. RUIZ: Looking at this, you've got the -- you're pointing out the prehistoric Native American site --

MR. MEYER: Mm-hmm.

MR. RUIZ: -- and you've got that placed along Honker Ridge. Again, sort of the same type of question. I'm trying to understand -- if you could help me to understand what you're trying to show with this figure.

MR. MEYER: Mm-hmm.

Well, let's go left-to-right, top-to-bottom. In the upper left-hand corner of the figure, we have a kind of a dark blue purple area where I have 5,000 cal BP written.

MR. RUIZ: I see that.

MR. MEYER: Now cal just is a sciency way of saying calibrated or calendar years. Because radiocarbon dates fresh out of the lab have to be calibrated to calendar years. You can't use the raw data. You have to calibrate it using correction curves.

So I've done that for you so we can all work in

calendar years here.

That's approximately where the sea had arrived based on the radiocarbon slash elevation data as plugged in to the digital elevation model.

And this is all done in the GIS, you know, geographic information system format. This is all digital. We don't -- I'm not manipulating the data. All I'm doing is arriving at the sea level curve.

Then as you go down, left-to-right, top-to-bottom, there's a lighter blue area, okay? Where the sea has now, between 5,000 and 3,000 years ago, the sea has now achieved that elevation. It's reached that much further into the Roberts Slough area.

Not slough. Roberts Island. Too many sloughs.

And the green area is based on absolute elevation, and the sea level curve is approximately where it would have arrived 2,000 years ago. And again, the yellow is its approximate extent a thousand years ago.

Now it does have a patchy quality. It's not a perfect, you know, enclosed polygon. But that's the nature of the digital elevation model. Those are artifacts.

And of course, there's been a lot of land modification out here as we've heard about all the

historic modifications that have taken place that have altered the prehistoric topography in such a way as we wouldn't expect there to be anything but patchiness out there on the ground.

MR. RUIZ: Specifically, when you say there's a patchy quality to it -- I think that's what you said?

MR. MEYER: Yeah.

MR. RUIZ: In looking at this figure, what are you -- are you referring to something that's depicted on the figure? Or what do you mean specifically by that?

MR. MEYER: The colors aren't continuous, but there's islands of green, islands of yellow and so forth, you know. And those are just demarcating different elevations.

In truth, the sea of course would have come in as one continuous unit. It didn't come in in patches, right? Seas don't tend to do that.

So that's the difference here.

MR. RUIZ: Okay. And then were you going to continue to go down to the bottom of the figure?

MR. MEYER: Yeah. Well, I got to the thousand cal BP and then we're back to Atwater's 1850 line, and all that seems to be in pretty good agreement.

MR. RUIZ: Okay. Then back to the demarcation for the prehistoric Native American site. Can you speak

about that a little bit?

MR. MEYER: Well, in doing the background work, I read that there were at least three prehistoric Indian mounds somewhere on Roberts Island, but they have not been relocated since the turn of the century.

And after hearing Steve Wee's testimony regarding a thing called the Honker Mound at the head of Duck Slough, I imagine that to be an Indian mound in my own mind because I'm in that frame of mind.

So I had a chance to drive out there across this area a week ago today and went down Inland Drive, stopped at the first bump in the road, looked around in a road ditch, and there's prehistoric archaeological remains there.

So all I'm doing is letting you know about that.

The implication of course is, like I mentioned in my presentation, you can't have people living on land forms that don't yet exist.

So if this land form was still building itself up historically, I wouldn't be able to find prehistoric stuff right on the top of it. But I can.

MR. RUIZ: Okay. Thank you. Mr. Meyer, when were you retained in this matter?

MR. MEYER: It's been about a month. I'd have

to look at the date exactly. It's been approximately a month.

MR. RUIZ: And in preparing for your testimony, did you review the testimony of Ken Lajoie?

MR. MEYER: I did.

MR. RUIZ: And the testimony of Don Moore?

MR. MEYER: I did not. Except what I heard today.

MR. RUIZ: Okay. Thank you, Mr. Meyer.

CO-HEARING OFFICER BAGGETT: Any other cross? Mr. Herrick?

MR. HERRICK: Yes.

CO-HEARING OFFICER BAGGETT: You appear poised.

MR. HERRICK: Thank you.

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CROSS-EXAMINATION BY MR. HERRICK

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MR. HERRICK: John Herrick for Mussi and Pak and Young.

Mr. Meyer, let me just go through this. Pardon my slowness here as I flip back and forth between different exhibits.

Mr. Meyer, do you contend that the what you've labeled Honker Ridge -- I think Honker Ridge is on the other side, but what you've labeled Honker Ridge on

figure 1 is or -- was or was not created by alluvial deposits?

MR. MEYER: I believe it was.

MR. HERRICK: And do you contend that there was not a slough running through that feature as of 1875?

MR. MEYER: I don't know for sure because I wasn't there, but I would say probably not based on what I've learned so far.

MR. HERRICK: Do you contend there was or was not a slough running through that feature as of 1900?

MR. MEYER: Same answer as before.

MR. HERRICK: Do you contend whether or not there was a slough running along that feature as of 1875?

MR. MEYER: Well, define for me what a slough is. Because as I mentioned in my presentation, a slough a tidal feature.

MR. HERRICK: We can use that definition. I'm just talking about a body of water that's long and narrow and connects to in this case Middle River and extends some distance along the feature you've identified as Honker Ridge.

MR. MEYER: Okay. I can go with that.

MR. HERRICK: So the question was: Do you contend that there was or was not a slough along what

you've labeled Honker Ridge as of 1875?

MR. MEYER: Again, I wouldn't use the word slough. I would use ditch or canal, would be a better definition.

MR. HERRICK: Okay. Well, we just defined slough based on your request.

MR. MEYER: We defined slough based on your definition. Yeah.

MR. HERRICK: I don't know -- I'm not trying to argue with you. I'm just trying to ask a question.

MR. MEYER: Okay.

MR. HERRICK: I'm asking whether or not you believe there was a slough running along what you've identified as Honker Ridge as of 1875?

MR. MEYER: Sure. Yes.

MR. HERRICK: You do contend there was a slough?

MR. MEYER: If you say a slough is a long body of water of some kind, there could well have been -- there could well have been a long body of water along the side there. I don't know. Like I said, I wasn't there.

MR. HERRICK: Would that be your same answer if I used the date of 1900?

MR. MEYER: Sure.

MR. HERRICK: Now do you have any knowledge as to whether or not someone might have dammed off the slough that may have been along this Honker Ridge in the late 1800s?

MR. MEYER: No, I don't have any knowledge of that.

MR. HERRICK: So then you would have no knowledge of whether or not such a dam might have had a floodgate to regulate the water in such a slough?

MR. MEYER: No. That was not my bailiwick.

MR. HERRICK: Now, I believe you said you agree that this feature was a result of alluvial deposition. Given the terrain of this area, if such an alluvial deposit was created by river flow, would you expect it to branch out from this main feature into smaller features?

MR. MEYER: Branch out in what way?

MR. HERRICK: I guess I'm assuming that this feature was created by a high flow carrying sediment with it, and at some time the high flow subsides, and the sediment remains.

So would you expect that this high flow would stay along this Honker Ridge feature, or would it dissipate into smaller flows or channels?

MR. MEYER: Well, that's a question that

requires an honest landscape reconstruction and would have to be determined by more on-the-ground data. I don't know the answer to that.

MR. HERRICK: So it's possible, is it not, that although this feature may have been created at a different time that one of the smaller offshoots of it connected to what you have labeled as Duck Slough? Is that possible?

MR. MEYER: Not as a continuous land form, no.

MR. HERRICK: I don't think I asked you that.

I said: Do you think that what you have identified as this Honker Ridge, when it was created, that one of the fingers going off of it could not have connected to what you labeled as Duck Slough?

MR. MEYER: That's speculation. I'm sorry. I have no way of knowing that.

MR. HERRICK: Is it possible in this tidal zone for the tidal -- as you call it, I think you called it the tidal Duck Slough, to have connected with the original channel that created the Honker Ridge feature?

MR. MEYER: Again, I don't know the answer to that. Further on-the-ground work would have to be done to make that determination.

MR. HERRICK: Have you done any research with regard to historical records which may confirm or deny

such a connection?

MR. MEYER: Certainly to some degree, I have. The historic record is there for most of us to see in the form of the natural levees that were built by hydraulic mine debris.

That -- the best example of that that I can show you -- and this is along the major active waterways which in this case was the main stem of the San Joaquin River.

You can see that it had a levee that was not inundated by the 1850 mark there according to Atwater. And that likely is itself, you know, part of the active levee system that was trying to maintain a channel but having a hard time doing so because of the amount of sediment being delivered at the river at that time.

So like I mentioned before, a levee is -- a levee building exercise is really an exercise in a stream that's beginning to die, having a hard time to maintain its course. It has to spit sediment out either side.

And in that case, the Columbia soil coincides with much of that area up around Stockton there. And we know from previous work that the Columbia series is essentially the equivalent of hydraulic mining debris.

MR. HERRICK: You lost me there. Is it your

contention that the creation of alluvial deposits is a function of a dying stream? Is that what you said?

MR. MEYER: Yeah.

MR. HERRICK: And do you think that -- you think that statement is consistent with the current continual silt deposits in the Delta from upstream flows from the Sacramento and San Joaquin Rivers?

MR. MEYER: Well, that's silt, not sand, right?

MR. HERRICK: But isn't the same siltation coming down the river?

MR. MEYER: No, no. That's not the same process at all.

MR. HERRICK: So you have to have a dying stream in order to create sedimentation of this type?

MR. MEYER: Well, it's often read by myself and other geomorphologists as a signal of a steam that was unable to maintain an incised channel. And instead, it -- in its effort to do so, which water wants to try to maintains its path, it tries to throw the material out of the way.

And the heavy stuff that is blocking its flow is usually the sand. And the sand is usually the only thing it has enough energy to throw off to the sides, and that's what creates these natural levee ridges.

They're often built over relatively short time

spans because of that, because deposition is not continuous.

In -- deposition of that type is not necessarily continuous. It often occurs in pulses. Like you mentioned earlier, it occurs during high flows. Doesn't occur all the time.

MR. HERRICK: So that your testimony is that this what you've identified as Honker Ridge could not have been created by pulses of high flows, that it had to be created at some time when that portion or that stream was dying? Is that you are saying or am I misunderstanding?

MR. MEYER: I believe that that ridge is demarcating a formerly active channel; and since it's a former channel, it's a dead channel.

MR. HERRICK: Now let me give you Exhibit DJN-R EX 16 for you to look at real quick. That exhibit is the one from the Hammond Hall papers. The date on it is circa 1880.

And when you've had a chance to review it, I think there is a blow-up, but it has a little bit of information, where it's from and a couple different views of the map.

When you are ready, please let me know.

MR. MEYER: Go ahead.

MR. HERRICK: Now, if you are presented with a map like this which appears to show Duck Slough going into the Honker Ridge feature you've shown, does that change your opinion as to whether or not there may have been an active slough, I think is the word you used, going all the way from Burns Cutoff to the Honker Ridge feature?

MR. MEYER: Well, again, using your definition of slough as a linear stretch of water; it could be a ditch or canal, artificial -- and this is an 1880 map, you said? So this is after reclamation.

When I looked at this map, I immediately noticed how different this looked from the other sloughs that are mapped in pretty good detail here.

MR. HERRICK: Okay. I think my question was: When you see a map like this, does it change your opinion as to whether or not the Duck Slough you have identified could have continued on into the Honker Ridge feature?

MR. MEYER: Continued into meaning what? Continued into meaning what?

MR. HERRICK: Meaning the water of the slough continued on through that feature or into --

MR. MEYER: Across the -- through the levee? Underneath the levee?

MR. HERRICK: Talking about the ridge or --

MR. MEYER: I'm asking you what -- the slough is going through what?

MR. HERRICK: Let me try -- I thought that was clear.

I'm asking you: If you look at a map like this, does it change your opinion as to whether or not what you've identified as Duck Slough could continue on and the slough continue on into the feature of Honker Ridge?

MR. MEYER: I wouldn't let a map like this influence my opinion.

MR. HERRICK: So a historical record of what could be someone's representation of the extent of a slough does not affect your conclusion about whether or not there is a slough there?

MR. MEYER: Not this map.

MR. HERRICK: Would other maps change your mind if they showed a similar extent of Duck Slough running I'll say approximately that same distance?

MR. MEYER: Well, that's speculation. If you get some other maps, I'd be happy to look at them.

MR. HERRICK: I'll get them in a minute.

Okay. You referenced the Atwater maps, and you have included as -- it's not a figure, but I think it's

part of your figure 1, the map behind figure 1; is that right? And I think this is the blow-up of that map. Let me just check with you.

MR. MEYER: Well, it's -- it doesn't include the Sacramento West Quad. We're just looking at the Holt Quadrangle here.

MR. HERRICK: Correct. Doesn't your page after figure 1, doesn't it reference the Holt Quadrangle also?

MR. MEYER: Yeah, it does. And portions of Sacramento West.

MR. HERRICK: The one --

MR. MEYER: I'm sorry; Stockton West.

MR. HERRICK: The one you presented has more information? This one?

MR. MEYER: I'm just saying that my figure has more than one topographic map represented in it.

MR. HERRICK: Okay. I was just trying to clarify that.

MR. MEYER: Yeah.

MR. HERRICK: Now as I read this map -- because we can't really see it on yours -- as I read this larger map, aren't the dotted lines by Atwater with arrows on them, is that his way of designating flow? Flow direction?

MR. MEYER: Flow or a temporary levee splaying.

I think those are meant -- I'd have to look at the key, actually, again, which I think I've got, but -- get it?

Okay.

MR. O'LAUGHLIN: We found the key.

MR. HERRICK: Mr. Meyer, I pulled up ours. I believe it's DJN-R Exhibit 12, and near the top but an inch or so down.

I believe, and correct me if I'm wrong, there are -- the key shows two arrows. One looks solid, has a 1 next to it. The 2 has a dotted line with the arrow.

And anyway, I'll just read it:

> Centerline or edge of waterway subject chiefly or wholly to nontidal flow. Arrow gives probable direction of flow dashed where location may err by more than 1500 feet. Circled numbers on the sheet. 14 denote relative ages of waterways, blah, blah, blah. 1 is older. 2 is younger.

MR. MEYER: Yeah.

MR. HERRICK: On this blow-up of the map -- let me put it in front of you.

On this Holt map from the Atwater series, I've circled two areas. And I'm sorry that's not before the Board, but two areas. And I believe -- and please

correct me because this is my interpretation.

I believe those arrows appear to denote a dashed line which goes down the middle of this High Ridge Levee and thus denote, according to the key, nontidal flow; is that correct?

MR. MEYER: That would be correct.

MR. HERRICK: So Atwater's saying -- and again, correct me if I'm wrong -- saying that as of 19 -- excuse me -- 1850 or before he's indicating some sort of watercourse or flow -- excuse me -- flow in that spot -- those spots?

MR. MEYER: I don't think that's what he means. I think he's indicating that in the late 1970s and early 1980s when this map was made that was the direction of water flow or the direction water would flow if it had the chance.

Also notice a different kind of arrow which you didn't indicate that does mark levee breaches.

MR. HERRICK: Certainly. I'm not trying to hide anything there.

MR. MEYER: I just wanted to be clear there's two kinds of arrows on there.

MR. HERRICK: Okay.

MR. MEYER: Okay. So we're only talking about one, not the other.

MR. HERRICK: According to the key -- and again, if I'm wrong please correct me -- according to the key those arrows that we just looked at are what he defines as nontidal flow. Or probable or whatever --

MR. MEYER: It would have to be because it's above sea level there at that point.

MR. HERRICK: Okay. On your figure 2 --

MR. O'LAUGHLIN: Are we done with this one?

MR. HERRICK: Yeah.

On figure 2 it shows various soils type; is that correct?

MR. MEYER: Yes.

MR. HERRICK: And based on those soil types, you're concluding that the area you marked as Duck Slough is the result of -- are you saying tidal action that has brought in sediments resulting from the Gold Rush era?

MR. MEYER: That is one possible interpretation.

Sloughs again, by definition, are tidal features. And in this case the mapper shows us that in 1940, 1941, he identifies the Columbia series soil as filling the area known as Duck Slough.

The implication being that it was filled up at some point with material that may have been generated by

the hydraulic mining outwash.

MR. HERRICK: And you know, as you know, there is contention here about whether or not sloughs exist in some areas. Do you know whether or not Duck Slough where you indicate it was dammed off in time to prevent gold mining sediment from entering that area or not?

MR. MEYER: I don't know specifically about that. I have no way of knowing that, no.

MR. HERRICK: I would ask you the same question at the other end of what we're alleging is Duck Slough: Do you know whether or not a channel or slough that existed or arose from Middle River may have been dammed off before gold-mining activities -- before the gold-mining activities of the Gold Rush?

MR. MEYER: No, I don't.

MR. HERRICK: Okay. Mr. Meyer, do you know whether or not the different soil types indicated here would preclude a slough from connecting Middle River all the way to Burns Cutoff going through what you've labeled both Honker Ridge and Duck Slough?

MR. MEYER: Not a slough as you defined it.

MR. HERRICK: That's not the question. The question is --

MR. MEYER: Well, you're the one that defined slough, so you need to stick to it.

MR. HERRICK: I don't know why this is getting so contentious. I'm trying to ask you whether or not the soils would prevent some sort of water feature from extending from Middle River all the way to Burns Cutoff along the lines we're talking here?

MR. MEYER: The soils wouldn't prevent it, no.

MR. HERRICK: See? It's very easy.

On your figure 3, just for clarity, this is the result of a model, is it not, to develop elevations, and then the elevations are colored for ease of interpretation?

MR. MEYER: That's correct.

MR. HERRICK: And excuse my complete ignorance. Could you briefly explain to us the DTM which you referenced with regard to this model?

MR. MEYER: Well, luckily there's people a lot smarter than us that know how to make these things. And all I know is how to access them off the internet and use them in various ways.

The USGS explains the reason for making this as being related primarily to concerns about levee stability and ongoing sea level rise in the Delta. And I believe that was the purpose this was created.

MR. HERRICK: And does it matter what the -- for purposes of our analysis today, does this -- do the

results from this model, does it matter whether or not the topography of the area may have changed in the past? And I don't mean a million years ago but changed in the last 150 years?

MR. MEYER: Matters to me. I don't know what you mean by matters.

MR. HERRICK: Like pulling teeth.

MR. MEYER: Well, what do you mean? Define your question.

MR. HERRICK: Do the results that we're looking at depend upon some assumption of topography?

MR. MEYER: They are elevations. They are essentially the ground surface at the present time as best we can model them electronically.

MR. HERRICK: Do you have any knowledge of any potential changes in ground surface elevation, especially with regard to peat soils in this area over the last hundred years?

MR. MEYER: I am aware of some potential ground changes.

MR. HERRICK: Okay. Do those potential ground changes affect the results -- would they affect the results of this modeling and thus the use of it here today?

MR. MEYER: They would affect the extent to

which the sea would appear to arrive at a certain place at a certain time.

Now, remember that the reason that you have oxidation and land subsidence is because the peat is going away. But the reason the peat is there in the first place is because the sea was there to create the peat.

So even if you took all the peat away, and we made these elevations that much lower, actually the sea would arrive even earlier.

So in allowing the peat to remain where it is, we're -- actually, this is a very conservative model. If you remove the peat, then you've got a lower elevation, right?

MR. HERRICK: Absolutely.

MR. MEYER: Yeah. So then the sea could encroach even further in than I suggested today.

MR. HERRICK: Do you know what the accuracy of this model is?

MR. MEYER: I think I mentioned it was about one meter vertical accuracy and about 20 meter horizontal accuracy.

MR. HERRICK: And in an area as flat as the Delta here, would that one meter of accuracy cause some problems in any production of a map like this?

MR. MEYER: Oh, there's always problems in production of a map like this. But the thing to recognize is that the USGS can explain the strengths and weaknesses of the mapping a lot better than I can.

Again, they designed this to try to detect levees. And their goal was to detect things as small as levees for the purposes of levee stability and sea level rise.

MR. HERRICK: Do you know what the elevation of the High Ridge was prior to 1900?

MR. MEYER: No, I don't have any idea precisely other than the first map that we have topographic information for is the Holt Quadrangle, 1911.

MR. HERRICK: And again, I'm just testing your knowledge here. Do you know whether or not that Holt Quad map was produced after there were improvements to the high ridge in order to make it a levee?

MR. MEYER: The Holt map would have been presumably produced after much of the reclamation efforts, yes.

MR. HERRICK: Okay. And would the height of the Honker Ridge or High Ridge feature affect any conclusion you may -- excuse me.

Would the height of the High Ridge prior to reclamation of the lands be relevant to your

determination of whether or not there was a waterway running through it?

MR. MEYER: If I knew what it was, it might. But I don't know what it was.

MR. HERRICK: Included in your documents are these high resolution digital terrain models of the Sacramento-San Joaquin Delta. I take that to be an explanation of the model that produced these maps?

MR. MEYER: Yeah, that's the technical pamphlet that accompanies that data.

MR. HERRICK: I just want to make sure there's nothing in here that I may have missed that deals specifically with the -- I don't want to overstate it -- the issues we're talking about.

MR. MEYER: Right.

MR. HERRICK: The background for how the model works.

MR. MEYER: Yeah. If you have any real interest or concerns, look to that website and they can explain it a lot better than I can.

MR. HERRICK: Your figures 4 and I guess 5 and 6, maybe seven too. 4, 5, and 6. They're your attempts -- although I don't mean that pejoratively -- to show how dating from radiocarbon results allows you to determine a range of sea level over the past,

correct?

MR. MEYER: That's correct.

MR. HERRICK: And from that, you determine when -- well, I guess the question is: Are you concluding from that data when certain features in this area were above sea level or below sea level or at sea level?

MR. MEYER: That's correct.

MR. HERRICK: And based on that, are you making a conclusion with regard to the depth of Duck Slough?

MR. MEYER: Well, the depth of Duck Slough is already concluded by the digital elevation model.

MR. HERRICK: But that -- I'm sorry. Just, you know, we're trying to follow through this.

MR. MEYER: Yeah.

MR. HERRICK: I don't mean to be argumentative.

MR. MEYER: Yeah.

MR. HERRICK: That model is estimating Duck Slough's depth as of what date?

MR. MEYER: Again, I'd refer you to them, but the document was produced in 2008. I would imagine that the data was obtained over a period of a year or two.

MR. HERRICK: And so it's not -- you don't mean to say that Duck Slough had a certain depth as of 1875 or 1900, do you?

MR. MEYER: No, I'm just showing you where it is today based on the best available data I can get my hand on.

MR. HERRICK: Okay. And for purposes of the extent of Duck Slough historically, the depth given Duck Slough by the -- under the model you used is irrelevant; is that correct?

MR. MEYER: The depth of Duck Slough is irrelevant?

MR. HERRICK: To determination of the length or extent of Duck Slough historically.

MR. MEYER: Right. Right. It -- Duck Slough historically may or may not even have existed at the time that sea level approached this position on the landscape.

MR. HERRICK: Okay. And so whether or not we know the height of the high ridge in 1875 or the depth or width of Duck Slough in 1879, any of those related specifics, that -- those determinations are not made or helped by the current model being used here?

MR. MEYER: No. The model -- well, the modern surface is the modern surface. We can't go back in time.

What we do know is that, as USGS geologist Mr. Lajoie has testified to the Board, that many of the

features we're seeing out here today are just now revealing themselves thanks to the oxidation of the peat, so things that were buried -- channels, levees, et cetera -- are now coming to light.

MR. HERRICK: That brings me to your figure 7. Again correct me if I'm wrong. It's sort of a cross-section and a --

MR. MEYER: Right.

MR. HERRICK: -- a time line; is that correct?

MR. MEYER: Right, yeah. Kind of -- if you kind of imagine the time line across the top from 0 to 3,000 also being 3,000 meters roughly. And in distance -- it's both time and distance in this way.

So you're looking at approximately the same lengths of the topography across Duck Slough and across the upper one is across what I'm calling Inland Drive just to show that Inland Drive is above sea level and that the majority of Duck Slough is below sea level.

MR. HERRICK: Let's start with your representation of Inland Drive. That's Inland Drive's height or --

MR. MEYER: Yeah.

MR. HERRICK: -- elevation?

As of what date?

MR. MEYER: As of the date that the elevation

model was created. And again, I would refer you to them for the exact date.

MR. HERRICK: I'm sorry. I didn't connect the two. So --

MR. MEYER: Okay.

MR. HERRICK: -- this elevation is --

MR. MEYER: Yeah.

MR. HERRICK: -- based on the modeling.

MR. MEYER: Yeah. The way we -- in a GIS format, all we have to do is ask it. We draw a line and say tell me what the elevations are along this line, and it just spits out the numbers.

MR. HERRICK: And again, this may sound repetitive, but I'm trying to match it to this figure. The elevations along Inland Drive on your figure 7 are not reflective of the elevations of the High Ridge which we've been talking about say prior to 1900?

MR. MEYER: Right. I didn't include High Ridge on this because I felt that it was too far afield, too far south. What I wanted to show was two landscape features that were in as close proximity to one another as possible, but of two different kinds of landscape feature.

MR. HERRICK: Okay. So again, this representation of Duck Slough on figure 7 and Inland

Drive is not an indication of the relative elevations of Duck Slough and High Ridge, the High Ridge feature, say prior to 1900?

MR. MEYER: Well, certainly these elevations were somewhere in there. The elevations are absolute. So they're always there.

Now whether the surfaces were also at these elevations is another matter.

MR. HERRICK: And that would be my follow-up question.

Are you familiar with the history of the construction of the levee along the High Ridge feature and the eventual construction of Inland Drive?

MR. MEYER: I've learned a bit about it today, but I'm not an expert on it at all.

MR. HERRICK: Do you know how much higher Inland Drive is now than the High Ridge was prior to 1900?

MR. MEYER: I could find out for you, but I don't know specifically.

MR. HERRICK: Turning to figure 8, and I believe this shows the extent of the -- correct me if I'm wrong -- of the tidal action over a time period, again based upon the prior information you developed of radiocarbon dating and predictions of the area around

sea level?

MR. MEYER: Right.

MR. HERRICK: And you highlighted on this map, I believe in your testimony, your oral testimony, the Native American site you located on what you call Honker Ridge?

MR. MEYER: Yes.

MR. HERRICK: Now is it your testimony that a Native American site on Honker Ridge means that there was no waterway running through Honker Ridge? And by through, I mean down its length.

MR. MEYER: Certainly not running through the site.

MR. HERRICK: Okay. Let me ask again. Is it your contention that the location of a Native American site precludes a waterway running down or along, running the length of what you labeled the Honker Ridge?

MR. MEYER: Not -- not necessarily. Not prehistorically, no.

MR. HERRICK: Does the existence of a Native American site on what you've labeled Honker Ridge preclude there being a waterway running along that feature?

MR. MEYER: Of course not, no.

MR. HERRICK: Now, I'm not sure I understood

your meaning by referencing the Native American site.

Are you saying that the -- are you suggesting that the Native American site was occupied all year or did the Native Americans go there during low flow times, or is that relevant, or are you making a representation about that?

MR. MEYER: No. I'm not. Certainly we know from other work that Native Americans did both. They moved around, and they had stationary village locations.

I don't know which -- whether this corresponds to one or the other here. The only way to find that out would be to do some archaeology.

MR. HERRICK: Generally speaking -- you can disagree with this question if you think you need to. Generally speaking, prior to 1850, this was a tidal tule marsh, was it not? The area. I don't mean the mound.

MR. MEYER: Yeah, yeah. Correct.

MR. HERRICK: So would you expect that the Native Americans would then take some sort of watercourse in order to arrive at their site there, or would they go through the marsh itself? Or do you know?

MR. MEYER: Well, prior to a thousand years ago, it wouldn't have been much of a walk around the bottom of the green area there to get out to that point because the water wasn't there yet. So it is not that

far out in the tules from that perspective.

There are prehistoric Native American sites located on mounds throughout the Delta region, and this is just one of them. Some of them are isolated. Some of them are along waterways. Some of them are not.

So I don't think you can draw a single conclusion from --

MR. HERRICK: So you're saying that -- or are you saying that you believe this site may have been reached on foot rather than via a watercourse?

MR. MEYER: It certainly could have.

MR. HERRICK: And it certainly could have been reached via a watercourse; is that correct?

MR. MEYER: If there was a watercourse available.

MR. HERRICK: Now I guess we're getting to top secret stuff talking about the specifics of this Native American site, but I didn't understand from your testimony.

Are you saying that you've dated the -- someone has dated the artifacts which would allow you to determine when water stopped flowing through the channel that created Honker Ridge? Is that what you're saying?

MR. MEYER: No.

MR. HERRICK: Tim?

MR. O'LAUGHLIN: Long day. I apologize.

MR. MEYER: Do you want me to elaborate?

MR. HERRICK: I didn't catch it all when you were talking about about the site, so I'm asking that question for clarification.

MR. MEYER: To clarify, the site contains flake stone tools made of nonlocal obsidian which is black volcanic glass which is pretty common. And obviously that doesn't grow in the Delta. You can't find it in the Delta. Comes from somewhere else.

The point types, some of the flake stone point types are a type called the Stockton serrate point which is a very specific point type.

It's one of the best-dated point types from Central California prehistory, and its time period is relatively restricted to between somewhere between 1,000 years ago and 500 years ago which is what we call the early -- either Phase I or early emergent period.

MR. HERRICK: Let me go back to my original question: Are you contending that dating of artifacts here preclude there being a waterway running down the length of Honker Ridge in the late 1800s?

MR. MEYER: No. I'm just saying that if you have people living on a land surface, the land surface has to be there and has to be stable, and it can't be a

boggy, sloggy open ditch or slough. Otherwise, you wouldn't have people living there. So that's all I'm saying.

MR. HERRICK: Couldn't those people be living on a two- to three-foot mound next to the boggy, soggy wet marshy area?

MR. MEYER: That's certainly possible, and they certainly probably did that.

MR. HERRICK: So there could have been a waterway right next to it?

MR. MEYER: There certainly was a tule marsh right next to it.

MR. HERRICK: Without sounding critical, is there any disagreement in the sea level aging community with regard to your calculation of where sea levels were over the past how many thousands of years?

MR. MEYER: Not of mine specifically, but there is some disagreement among those scholars who care. But I can say with certainty that I don't believe anyone else has as much of the radiocarbon data to bring to bear on this issue than I do.

MR. HERRICK: And again this is not meant with snide or anything, but do you recall whether or not Mr. Lajoie has calculated sea level rise over a similar period and whether it differs from yours?

MR. MEYER: Yeah, it does. And I have to -- that's one reason I found it necessary to do it myself because I frankly couldn't understand why he chose the data sets he did or could possibly have arrived at a linear -- why sea level rise would be linear when everyone knows it's not.

MR. HERRICK: Figure 9 is just a zoom-in of figure 8, I believe?

MR. MEYER: That's correct.

MR. HERRICK: Without wasting everybody's time too much, your figure 10, you talk about there being features that natural levee ridges form by prehistoric channels but they don't have any current channel with them?

MR. MEYER: That's correct.

MR. HERRICK: And excuse my forgetfulness since Boy Scouts and reading maps, but you're showing lines of ridges on this map indicated by -- are those green lines? I'm colorblind so --

MR. MEYER: That's kind of red.

MR. HERRICK: Red. Thanks.

But is it relevant to your conclusions here that natural drainage flows between those lines even today?

MR. MEYER: That natural drainages flow between

those high points today? Is that what you're saying?

MR. HERRICK: Yeah. In other words, the fact that you don't have a continuous flow in a stream doesn't preclude the fact that there could be a waterway next to these ridges?

MR. MEYER: I've been out there, and I can tell you there is not a waterway next to these ridges.

MR. HERRICK: When it rains, the water goes up the ridge?

MR. MEYER: I think you know what direction the water goes. But that's not -- you asked -- that's not the question you asked me.

You asked me if it goes -- if there are channels or waterways next to these things, right? You didn't ask me what direction water flows.

MR. HERRICK: I'm not sure that was my question, but that's fine. Let me just quickly check here.

Your conclusions regarding the artifacts found on the Native American site on what you designated Honker Ridge, did you take into account or has anyone taken into account work by western men post 19 -- post 1850? What I mean is dredging or scrapers or any other activity that may have disrupted the site moved things?

MR. MEYER: Sure. That's a good question.

That's a real possibility, and it is possible that there are some -- well, there's undoubtedly some surface disturbance there of various sorts. Otherwise, we wouldn't have the canal next to it and a farm on top of it and a road going through it. Those are obviously disturbances, certainly.

MR. HERRICK: Okay. I'm pausing because I can't read my own handwriting. I'm sorry. Let me just take one minute here to go back through my original notes.

Oh. I was going to ask you: In the radiocarbon dating of Delta samples, if that's the right way to say it, where are those Delta samples from?

MR. MEYER: They are from a number of islands. I could have provided a map to show sample locations as well. But they're from all throughout the Delta Bay region.

Truthfully, there's not one from Roberts Island, to be honest with you. I don't have a radiocarbon date from Roberts Island. But there are some from nearby places.

MR. HERRICK: And Mr. Ruiz asked you -- and I didn't hear the answer -- did you review Mr. Lajoie's testimony for this?

MR. MEYER: I did review it, yeah.

MR. HERRICK: And do you recall his map -- I'm sorry. I didn't bring it up here. If you pardon me one second. Let me hand you -- it's our exhibit R-29 which includes one of the -- yes. Let me show you the one I have, so we're talking about the same thing.

MR. MEYER: I believe from Mr. Moore's testimony and this is from Mr. Lajoie's testimony.

MR. HERRICK: And in reviewing this -- I keep calling it a map. It's a map overlay with other information he developed, and the information is sort of color-coded.

But does this representation by Mr. Lajoie conflict with any of your testimony here today?

MR. MEYER: Well, I'm not exactly sure what he's trying to show there. Tell me what the red stuff is again?

MR. HERRICK: I believe he's indicating the red stuff are the alluvial deposits resulting from downstream flows originating on the San Joaquin River.

MR. MEYER: Yeah. I don't see any inconsistency. I would agree that those are primarily alluvial soils deposited under channel conditions, yes.

MR. HERRICK: And do you know whether or not the -- any of the three red fingers on the right part of the map -- that's a horrible description -- but running

north and south.

MR. MEYER: Yeah.

MR. HERRICK: Do you know whether or not as of say 1900 those features had some sort of watercourse running through -- or the length of them, I mean?

MR. MEYER: Well, I have seen a few of the maps where it appears that they do. But since it's all post reclamation, I have no way of knowing whether it's natural or artificial.

MR. HERRICK: Do you know whether or not tidal flows from the Burns Cutoff direction would enter any of those I call them three fingers or the channels there prior to 1900?

MR. MEYER: You mean prior to 1850?

MR. HERRICK: No. I said 1900. Sorry.

MR. MEYER: Yeah. Only with the tide gates or if the levee was down.

MR. HERRICK: Okay. So you're assuming that -- or --

MR. MEYER: I mean elevationally speaking, yes. But physically, there are barriers in the way.

MR. HERRICK: So your answer is based upon your understanding that there were barriers to such an action?

MR. MEYER: Presumably so, yeah.

MR. HERRICK: So let me ask that same question with regard to prior to 1875. And I use that date as just a general date for when the serious reclamation of this part of Roberts Island was either under way or beginning.

MR. MEYER: Mm-hmm.

MR. HERRICK: So do you think tidal flows could have entered those three fingers from the Burns Cutoff direction?

MR. MEYER: Well, those three fingers are levee ridges, not sloughs. They're high spots, not low spots.

MR. HERRICK: I thought my prior questions dealt with whether or not there were water features running through those, and you said there could be.

So I was just saying -- maybe it's a hypothetical -- if there were, as you said there could be, then to your knowledge would water flow on the tide to the south up those supposed channels?

MR. MEYER: Prior to reclamation, it obviously was overtaken by tidal flows, yes, that entire area.

MR. HERRICK: Okay.

MR. MEYER: Well within the 1850 tidal zone.

MR. HERRICK: Do you have any opinion as to whether or not what you've identified as Duck Slough connected to any of those fingers that I'm referring to?

By the fingers I mean a water channel running through or near them.

MR. MEYER: At what time period?

MR. HERRICK: Prior to 1900.

MR. MEYER: I've seen maps where there is a connection between waterways, as you call them, yes.

MR. HERRICK: Okay. Again, excuse me. Just trying to make sure I don't miss some earth-shattering point here.

Last couple of questions, Mr. Meyer. Thank you for your patience. I think you said, and this is not a quote, so please correct me.

I think you said that you would need a gradient to form a ridge in the area of the Delta. Did you say something like that, or do you agree with that?

MR. MEYER: Yeah. I did say something like that.

MR. HERRICK: Okay. And do you mean a gradient of the land, or gradient -- or could it be a gradient of upstream, up valley, high flows coming down with lots of whatever, siltation in them.

MR. MEYER: Right. Well, it takes a couple things to get deposited -- to get sediment transported and deposited. And one is velocity and the other is a gradient to allow movement of that sediment.

And in these cases, there certainly would have to have been some gradient in order to help that settlement move along, but that would place it prior to the tide reaching this area.

MR. HERRICK: Could you not have a high flow even in the current era running into the tide and still transporting sedimentation into a Delta island to form some sort of ridge?

MR. MEYER: You could on a small scale, and that may be what the Columbia series soil is marking within the Duck Slough area and a few other small slough areas, yes.

MR. HERRICK: That occurrence would be affected by our modern changes to channels by narrowing them and making them turn here and blocked off there so that the deposition of that sort of sediment is now more of a function of how we've changed scenery; is that correct?

MR. MEYER: Yeah, and how we mined the hills.

MR. HERRICK: Those are all the questions I have. Thank you very much. I'm sorry for going so late.

CO-HEARING OFFICER BAGGETT: Any other questions from any party? Ernie, Dana, Charlie? Okay.

Exhibits?

MR. O'LAUGHLIN: Yes. We'd like to move into

evidence MSS-R-8 which is the drawing by Mr. Nomellini, on the 1937 air photo. MSS-R-9. And then MSS-R WEE-1 through 73.

CO-HEARING OFFICER BAGGETT: Any objection?

MR. HERRICK: I have no objection.

CO-HEARING OFFICER BAGGETT: Okay. So entered.

(Whereupon Exhibit MSS-R-8 and 9 were admitted in evidence.)

MR. HERRICK: Interrupt for a second. I'm not sure we moved in R-40 which was a document I introduced under Mr. Wee's cross-examination.

CO-HEARING OFFICER BAGGETT: Is there any objection, if not entered?

MR. O'LAUGHLIN: You know what? I misspoke MSS-R WEE 1 through 76. I said 1 through 73. Sorry.

CO-HEARING OFFICER BAGGETT: Correction is noted.

MR. HERRICK: Besides moving in R-40 which was the War Department letter to Congress as of 1895, I would like to enter in this enlarged map that I just discussed with Mr. Meyer. And I'll mark that R-41.

And the reason I'm doing that, I drew circles on it and asked him questions about that.

MR. O'LAUGHLIN: No objection.

CO-HEARING OFFICER BAGGETT: Without objection,

so entered.

(Whereupon Exhibits MUSSI R-40 and R-41 were admitted in evidence.)

CO-HEARING OFFICER BAGGETT: Anything else? All exhibits? That concludes two hearings.

MR. ROSE: Board Member Baggett.

CO-HEARING OFFICER BAGGETT: Prosecution Team, you have rebuttal?

MR. ROSE: We have very brief rebuttal. I can't speak as to the cross. I'll be very brief.

CO-HEARING OFFICER BAGGETT: Okay.

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MARK STRETARS

Called on rebuttal by PROSECUTION TEAM

DIRECT EXAMINATION BY MR. ROSE

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MR. ROSE: I have brief questions. First of all in your testimony, your written testimony, you state that the property -- and this would apply to both the Pak/Young and Mussi parcels -- were riparian to Duck Slough, a natural channel in 1870; is that correct?

MR. STRETARS: Yes, that's correct.

MR. ROSE: You next state in your written testimony that, and I'll refer to both, the properties were shown abutting natural channels on a 1911 USGS map;

is that correct?

MR. STRETARS: That's correct.

MR. ROSE: So if the map you labeled as the 1970 tidal map -- 1870 tidal map; that's PT-09 -- in fact showed 1877 or a different year data than 1870, would that change your conclusions, at least as they reflect the information you had in front of you when you prepared your testimony?

MR. STRETARS: I don't believe so.

MR. ROSE: Okay. Have you been present for these hearings?

MR. STRETARS: I have.

MR. ROSE: Has new information been presented that you had not seen when writing your testimony?

MR. STRETARS: Yes, a good amount.

MR. ROSE: Have you revised your conclusions in any way based on the new information presented at this hearing?

MR. STRETARS: I have not completely -- there's been such a large amount of it that I feel I have to look at it some further depth before I can draw a different conclusion.

MR. ROSE: So you would -- you have not changed your conclusions at this point?

MR. STRETARS: No, I have not.

MR. ROSE: I don't have any further questions on direct.

CO-HEARING OFFICER BAGGETT: Any cross? No cross? You have cross?

MR. O'LAUGHLIN: I do.

CO-HEARING OFFICER BAGGETT: Limited to the scope of the rebuttal, of course, Mr. O'Laughlin.

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CROSS-EXAMINATION BY MR. O'LAUGHLIN
FOR MODESTO IRRIGATION DISTRICT

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MR. O'LAUGHLIN: Scope was his entire review of the record. Should be pretty broad.

Mr. Stretars, were you present when Mr. Wee testified in regards to the construction of the damming of Duck Slough in 1875-1876?

MR. STRETARS: Yes, I was.

MR. O'LAUGHLIN: Okay. That was located at Burns Cutoff; is that correct?

MR. STRETARS: I believe that's correct.

MR. O'LAUGHLIN: Okay. Are you of an opinion that -- do you have an opinion as to then the riparian nature of a parcel, either Pak Young or Mussi, if the hydraulic connection is severed at Burns Cutoff?

MR. STRETARS: Do I have an opinion? Yeah, I

think I have an opinion.

MR. O'LAUGHLIN: What's your opinion?

MR. STRETARS: It may not be relevant because the property -- we haven't as yet concluded there wasn't a stream coming from the Middle River side.

MR. O'LAUGHLIN: Oh, so you haven't arrived at an opinion then whether or not there's a stream coming from Middle River to the Pak Young Mussi parcel?

MR. STRETARS: That would be part of my --

MR. O'LAUGHLIN: Okay.

MR. STRETARS: -- evaluation.

MR. O'LAUGHLIN: Yeah. So what leads you to believe there's a natural watercourse coming from Middle River to the Pak Young Mussi parcel at any time prior to 1900?

MR. STRETARS: Some of the old maps we'd seen. The 1870 one which was our original evaluation.

MR. ROSE: Are you referring to the 1870 map that we're now suggesting -- or has been suggested is in fact dated 1877?

MR. STRETARS: That's correct.

MR. O'LAUGHLIN: Okay. Does that show any hydraulic connection to Middle River?

MR. STRETARS: I have to look at the map again. I don't recall.

MR. O'LAUGHLIN: Okay. Do you know if and when in any testimony that's been presented in these hearings as to when the Duck Slough, if it existed at Middle River, was cut off from Middle River?

MR. STRETARS: Would you repeat that question? I was --

MR. O'LAUGHLIN: Sure.

When -- have you reviewed any testimony in this proceeding if Middle River was hydraulically connected to Duck Slough when it was leveed off or dammed off?

MR. STRETARS: I don't think there's been much evidence presented either way on that.

MR. O'LAUGHLIN: Okay. Is it your opinion that Duck Slough remained open at Middle River and was hydraulically connected and no levee was ever constructed there?

MR. STRETARS: No, it's not.

MR. O'LAUGHLIN: Okay. Do you have any independent evidence of when the levee was constructed there?

MR. STRETARS: No, I do not.

MR. O'LAUGHLIN: Okay. How is it that you can come to an opinion or have an opinion if you don't know the dates or times of when the hydraulic connections to Duck Slough were cut off from either Burns Cutoff or

Middle River?

MR. STRETARS: I don't know that I said I came to a conclusion. I said I had to look at the information further.

MR. O'LAUGHLIN: I have no further questions.

CO-HEARING OFFICER BAGGETT: Mr. Herrick, do you have any? Staff?

MS. KINCAID: I do have one or two questions just real quick.

CO-HEARING OFFICER BAGGETT: Okay.

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CROSS-EXAMINATION BY MS. KINCAID

FOR SAN LUIS & DELTA-MENDOTA WATER AUTHORITY

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MS. KINCAID: Mr. Stretars, were you here yesterday -- maybe it wasn't yesterday; last week, excuse me -- when -- this is all running together -- when Mr. Arnold testified regarding the 1870 Tidal Map?

MR. STRETARS: Yes, I was.

MS. KINCAID: It's my recollection -- let me know if it's yours or your recollection differs from mine -- that Mr. Arnold testified that if he saw evidence that the map he dated 1870 were dated post reclamation in 1877 that his conclusions regarding that map would change. Is that your recollection of his

testimony?

MR. STRETARS: I think he said may, not would. But other than that, yes.

MS. KINCAID: And Mr. Arnold is not here today on rebuttal; is that correct?

MR. STRETARS: That's correct.

MS. KINCAID: That's it. Thank you.

CO-HEARING OFFICER BAGGETT: Any exhibits?

MR. ROSE: No additional exhibits.

CO-HEARING OFFICER BAGGETT: Thank you.

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(Thereupon the WATER RESOURCES CONTROL BOARD hearing adjourned at 5:28 p.m.)

CERTIFICATE OF REPORTER

I, LINDA KAY RIGEL, a Certified Shorthand Reporter of the State of California, do hereby certify:

That I am a disinterested person herein; that the foregoing WATER RESOURCES CONTROL BOARD hearing was reported in shorthand by me, Linda Kay Rigel, a Certified Shorthand Reporter of the State of California, and thereafter transcribed into typewriting.

I further certify that I am not of counsel or attorney for any of the parties to said meeting nor in any way interested in the outcome of said meeting.

IN WITNESS WHEREOF, I have hereunto set my hand this July 29, 2010.

LINDA KAY RIGEL, CSR
Certified Shorthand Reporter
License No. 13196