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BOARD OF LAND AND NATURAL RESOURCES

STATE OF HAWAI'I

In the Matter of a Contested Case Regarding the Continuation of Revocable Permits (RPs) for Tax Map Key Nos. (2) 1-1-001 :044 & 050; (2) 2-9-014:001, 005, 011, 012 & 017; (2) 1-1-002:002 (por.) and (2) 1-2-004:005 & 007 for Water Use on the Island of Maui to Alexander & Baldwin, Inc. (A&B) and East Maui Irrigation Company, LLC (EMI) for the remainder of the 2021 RPs, if applicable, and for their continuation through the end of 2022	DLNR File No. CCH-LD-21-01 **DESIGNATION OF WRITTEN DIRECT TESTIMONY OF DR. AYRON STRAUCH;** **APPENDIX A**

DESIGNATION OF WRITTEN DIRECT TESTIMONY OF DR. AYRON STRAUCH

Pursuant to Minute Order No. 8 regarding Prehearing Conference Procedures, Applicants Alexander & Baldwin, Inc. ("**A&B**") and East Maui Irrigation Company, LLC ("**EMI**") hereby designate the testimony of Dr. Ayron Strauch presented in the trial in *Sierra Club v. Dept. of Land & Nat. Res.*; Civil No. 19-1-0019 JPC, in the Circuit Court of the First Circuit, State of Hawai'i (the "**Trial**") as the written direct testimony for Dr. Strauch. *See* Minute Order No. 8 at

p. 3 ("Testimony from the [Trial] may be used as written direct testimony for witnesses."). A copy of the transcript from Dr. Strauch's testimony at trial is attached hereto as Appendix A. Portions of the transcript containing lengthy discussions on evidentiary objections have been excised for convenience.

To satisfy the cross examination requirement, A&B/EMI will seek to have Dr. Strauch appear at the hearing in this contested case. A&B/EMI anticipates eliciting additional testimony from Dr. Strauch on the topics identified in A&B/EMI's witness list, filed concurrently herewith. *See* Minute Order No. 8 at pp. 2-3 ("If witnesses are appearing by subpoena and direct written testimony is not available, a detailed description of the subject areas to which that witness is anticipated to testify will be required. The description of the anticipated testimony shall be provided in the listing of the witness on the party's witness list.").

DATED: Honolulu, Hawai'i, November 12, 2021.

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IN THE CIRCUIT COURT OF THE FIRST CIRCUIT

STATE OF HAWAII

SIERRA CLUB, Plaintiff, vs. BOARD OF LAND AND NATURAL RESOURCES, et al., Defendants.	Cv. No. 19-1-0019

TRANSCRIPT OF PROCEEDINGS

Had before the HONORABLE JEFFREY P. CRABTREE, Judge presiding, on AUGUST 14, 2020, regarding the above-entitled matter; to wit, FURTHER JURY-WAIVED TRIAL.

APPEARANCES:

DAVID KIMO FRANKEL, ESQ.	For the Plaintiff
DAVID SCHULMEISTER, ESQ. TRISHA AKAGI, ESQ.	For Alexander & Baldwin
WILLIAM WYNHOFF MELISSA GOLDMAN Deputies Attorney General	For State of Hawaii (DLNR/BLNR)
CALEB ROWE Deputy Corporation Counsel	For County of Maui

REPORTED BY:
Jamie S. Miyasato
Official Court Reporter
First Circuit Court
State of Hawaii

Appendix A

I N D E X

go.

MR. WYNHOFF: Your Honor, this is Bill Wynhoff off camera. I am very sorry, but we're having a little technical difficulty. And I think I can be back in a minute or so, if I might ask the Court's indulgence.

THE COURT: That's all right. We'll take a brief recess. We're off record.

(A recess was taken.)

THE COURT: We're back on record. All right. I see everybody I'm supposed to be able to see. So let's go ahead. I think your --

MS. GOLDMAN: Thank you, Your Honor.

THE COURT: Okay. Go ahead. No problem.

MS. GOLDMAN: Can we do a sound check please. Just make sure this is okay for the court reporter?

THE COURT: We just did one. It started off bad and then got better.

MS. GOLDMAN: Okay. What about that? Is that any better? Okay. Please stop me if -- okay.

AYRON M. STRAUCH, Ph.D.,
Called as a witness by the State,
having been first duly sworn,
was examined and testified as follows:

DIRECT EXAMINATION

BY MS. GOLDMAN:

Q Dr. Strauch, could you pronounce your last name?

A Strauch.

Q Dr. Strauch, could you do a sound check please?

A This is me. Do you hear me loud and clear? Okay.

Q Okay. Thank you.

Has the witness been sworn in?

THE COURT: Yes.

BY MS. GOLDMAN:

Q Okay. Excuse me. All right.

So Ayron or Dr. Strauch.

THE COURT: Wait a minute. Time out. Sorry. We weren't unanimous, but now we are.

Sorry, Ms. Goldman. Go ahead.

MS. GOLDMAN: No problem.

BY MS. GOLDMAN:

Q Doctor, you know why you're here today; right?

A Yes.

Q And are you aware of this -- of this legal case currently pending?

A Yes. I testified in front of the Board in

2018, when the initial revocable permit was -- came up.

Q Okay. And let's see. What is your -- in what capacity did you testify before the Board?

A As a hydrologist with the Commission on Water Resource Management charged with protecting stream resources.

Q Okay. So let's see. Let's talk about what's a hydrologist. Could you tell us?

A Somebody who studies water.

Q Okay. And tell us about your educational background that allows you to do this.

A I have a Ph.D. from Tufts University. I took courses and studied Interdisciplinary Water Resource Management and Ecology and Hydrological Sciences. I took a postdoc, or as the University of Hawaii title states, a junior researcher position here in Hawaii studying climate change impacts to fresh water ecosystems. And that incorporated a lot of hydrological sciences as well as ecological sciences.

Q So tell me, what year did you graduate or did you earn your Ph.D.?

A 2010.

Q And the postdoc studies that you were doing, how long did that last for?

A Three and a half years.

Q So it ended in what year?
A 2014.
Q Okay. And what did you do after that?
A I took a position with the Commission on Water Resource Management.
Q And what is your title at the Commission on Water Resource Management? And for the record, I believe that we will be referring to it either as the Commission or as CWRM, which is C-W-R-M, the acronym for the name.
A Hydrologist.
Q Okay. And what are some of your roles and duties as a hydrologist with CWRM?
A I'm in the Instream Use Protection Section of the Stream Protection and Management Branch. My duties involve establishing instream flow stands and interim instream flow standards, monitoring stream resources, and collaborating across agencies to gather information to support decisions that the Commission makes.
Q Okay. And you mentioned IIFS. Could you please just very briefly remind everyone what that is.
A An IIFS or interim instream flow standard is the amount of water that must remain in the stream to protect instream values as defined by the Water Code, State Water Code HRS 174C.
Q And are you -- are you able to list what those

values are?

A So the value -- the instream values that we focus on include things like fresh water habitat, ecosystem services, recreational values.

THE COURT: Slow down.

THE WITNESS: Sorry.

THE COURT: That's all right. Try again.

THE WITNESS: I'll start over. Fresh water habitat, ecosystem services, recreational values, aesthetic values, traditional and customary practices, instream hydropower, navigation, and the conveyance of water.

BY MS. GOLDMAN:

Q Okay. And so how -- just connect the dots for us. In establishing or studying an IIFS, which is one of your job duties, how do these values -- how do these values come into your determination of what the IIFS should be?

MR. FRANKEL: Objection. Assumes facts not in evidence regarding determinations.

THE COURT: I mean, the question is how do these values come into your determination of what the IIFS should be.

MR. FRANKEL: Oh, should be. I'm sorry. I didn't hear the should be. That's okay.

THE COURT: You may answer.

THE WITNESS: We use information from a variety of resources, things like the DAR Atlas of Hawaiian Watersheds and Aquatic Resources, the Hawaii Stream Assessment, various USGS studies conducted on the hydrology and ecology of Hawaiian streams, private studies, other agency studies, EIS's, research from the university and other agencies. We try and gather the best information available to support the Commission's decision.

BY MS. GOLDMAN:

Q Okay. And let's just go back to this and discuss this more. But I'd like to talk about your familiarity with the East Maui area generally and specifically with the East Maui licensed area at issue in this case. When I say that, are you aware of the area that I'm talking about?

A I am.

Q Okay. Have you ever been there?

A Quite a lot, yes.

Q Okay. And have you ever been there for work?

A Yes.

Q Okay. What kind of work have you done on -- in East Maui?

A So I've studied the hydrology and ecology of

most -- many of these streams that are of interest. The Commission -- prior to my position -- prior to me taking a position with the Commission, interim instream flow standards were established at five locations in East Maui in 2008 and then another six locations I believe in 2010.

The Commission worked with the U.S. Geological Survey to establish monitoring stations at that time. And it was my -- it has been my job to maintain these monitoring stations to monitor the hydrology of these streams to verify that the interim instream flow standards are being met.

In my capacity as a junior researcher at the University of Hawaii, I also studied the ecology of many of these streams. That includes snorkel surveys and seine net surveys of native biota classifying stream habitat as well as the background information studying all the literature that has been, you know, published about these streams.

Q And in your current role in the Instream Stream Protection Unit?

A Instream Protection Section.

Q Section. Thank you. In that capacity, how many hours of field work do you think you've done in East Maui in this licensed area?

A Rough estimate, probably in the range of 1,200

to 1,600 hours.

Q Okay. And that would be since 2014?

A Yeah.

Q So on average how many days a year do you spend on East Maui, except --

A About 20.

Q Okay. And when is the last time you were there?

A Last week.

Q Okay. And when you were there last week, what were you doing?

A I was measuring streamflow and doing diversion verification.

Q Okay. And although this might seem a tedious exercise, I believe it is important to lay foundation for the remainder of your testimony today. I'd like to ask you about which streams you've been to in East Maui. Go down a list and just ask you whether you've personally been there.

A Okay.

Q Okay. The first one is called Honopou Stream. That's H-o-n-o-p-o-u. That's Hydrologic Unit No. 6034.

A Yes.

Q Okay. When is the last time you went there?

A Mid-July.

Q Okay. How many times do you think you've been to Hanapou Stream?

A Probably -- for field work or for like official site visits that involve, you know, not me doing field work?

Q How about field work.

A Let's say 60 times for field work and another dozen times for non data collection related site visits.

Q Okay. And are you aware of what the -- was this stream once a subject of the contested case that resulted in the 2018 decision and order by CWRM?

A Yes.

Q And was there -- was it given a new IIFS from the decision?

A The Commission decided to fully restore the stream, and in that case the IIFS was not a quantifiable number. It was to be the natural flow -- (indiscernible).

Q Okay. We'll return to this, what that means to fully restore a stream. But let's just slow down and just get an inventory of your personal experience at each of these places.

So the next stream is Hoolawa Stream. That's H-o-o-l-a-w-a. Hydrologic Unit No. 6035. Have you been there?

A Yes.
Q How many times?
A Maybe a dozen times.
Q Okay. Were these in your -- in your capacity for work or pleasure or --
A Work.
Q Okay. When you visited Hoolawa, did that also include its tributaries -- Hoolawa ili, that's Hoolawa with i-l-i or Hoolawa nui, n-u-i, tributaries?
A Yes.
Q And have you visited any diversions in person on that --
A Yes.
Q Okay. And was that stream -- what is the current IIFS for that stream?
A The status quo from the Hawaii Administrative Rules established in 1988.
Q And what is -- what is the status quo? Do you -- can you just explain that a little further for us.
A It's the amount of water that was flowing on the effective date in 1988.
Q Okay. Okay. Let's move on to Mokupapa Stream. That's M-o-k-u-p-a-p-a Stream. That's Hydrologic Unit No. 6035 also. Have you ever been there?
A No.

Q No? Okay. Have you ever looked at any data from there?

A Yes.

Q Okay. Have you ever seen a photograph of any of the diversions there?

A Yes.

Q We'll come back to -- we'll come back to that one. But okay. Let's move on to the next one. That's Waipio Stream. W-a-i-p-i-o. Hydrologic Unit No. 6036.

MR. SCHULMEISTER: Excuse me. Could I just ask some foundation laid about what the hydrologic unit numbers are in your questions? Because I don't think we've had testimony on that.

MS. GOLDMAN: Thank you for reminding us. At this point I just associate.

BY MS. GOLDMAN:

Q Could you explain that please, Ayron. What's the hydrologic unit number?

A So the Commission manages resources by hydrologic unit, and that is because the State of Hawaii has too many watersheds that are either too small to be managed individually or are a part of other watersheds. And so a hydrologic unit is somewhat similar to a watershed, but it often incorporates minor neighboring watersheds or intermittent or ephemeral streams of

neighboring watersheds.

So in this situation, the Hoolawa hydrologic unit includes the Mokupapa Stream. Because it's such a small stream, it was incorporated together with Hoolawa.

Q And so that's why they have the same hydrologic unit number?

A Yes.

Q And do these numbers go in order?

A Yeah.

Q What -- what kind of order is it or what's the order determined by?

A Topographic. Their relationship on the island.

Q Okay. And are these numbers recorded somewhere for your use and for the public's use?

A Yeah. There was a publication in I would say 20 years ago, before my time at the Commission, that identified the hydrologic unit numbers.

Q Would it be helpful to view that document in order to refresh your recollection about its title and year?

A I mean, do you -- do you -- is the year of publication important to you?

THE COURT: I don't think I need that, but you can make your record if you wish.

MS. GOLDMAN: Okay. I was just going to bring the Court's attention to the State's proposed Exhibit S-6, which -- let's double-check in my notes, Your Honor -- which is not in evidence and which is the document in which CWRM maintains these hydrologic unit names and numbers.

THE COURT: Again, that's fine. I don't expect I'm going to be making findings of facts about hydrologic units. I think I'll be talking about streams.

MS. GOLDMAN: Okay. Thank you.

Please continue to ask if we need more foundational questions for these things. Thank you, Mr. Schulmeister.

BY MS. GOLDMAN:

Q Okay. So going back to the Waipio Stream, that was Hydro Unit 6036. Have you been there?

A Yes.

Q Okay. How many times?

A I'd say four.

Q Okay. And when do you think the last time you went there was?

A In July.

Q Okay. July of this year?

A Yes.

Q Like -- okay. And why did you go there?

A To verify stream diversion and to assess the upper watersheds.

Q Okay. Okay. And what is the current IIFS for that stream, for --

A Status quo.

Q Okay. And again, that means that that's an amount that was set by statute; right?

A (Inaudible response.)

Q All right. Moving on to the next stream, Hanehoi. That's H-a-n-e-h-o-i. Unit No. 6037. Have you ever been there?

A Yes.

Q How many times?

A I'd say 60.

Q Why so many?

A So on streams where we have monitoring stations, I return there about every two to three months as practice. But also for diversion verification, various site visits.

Q Okay. We'll go back. I'd like to talk to you in a little more detail about monitoring stations later, but we'll just continue with this list for now.

What is the IIFS for that stream currently? Do you know?

A Full restoration.

Q Okay. As determined by whom or when?
A The 2018 decision and order by the Commission.
Q Okay. Thank you. All right. Moving on to Hoalua Stream. That's H-o-a-l-u-a Stream, Unit No. 6038. Have you been there?
A Yeah.
Q How many times?
A I'd say 120.
Q Okay. Why so many times there?
A It's very easily accessed from the main road, Hana Highway.
Q And what is the current IIFS for that stream?
A Status quo.
Q Thank you. So the next stream, moving on to Hanawana Stream. H-a-n-a-w-a-n-a. Sometimes spelled slightly differently. But it's Unit No. 6039. Have you been there?
A No.
Q No. Okay. Are you familiar with any diversions there despite not having seen them in person?
A Yes.
Q How are you familiar?
A Through photos and registration files.
Q Okay. Photos and registration files. Okay.
A They had verification field work done before

me.

Q Okay. Okay. And what is the current IIFS for that stream?

A Status quo.

Q Okay. And so moving on to the next one, Kailua Stream. I think we can avoid spelling finally. 6040. Have you been there?

A Yes.

Q Okay. How many times?

A About 120.

Q Okay. And why so many there?

A Again, it's easily accessed. Yeah.

Q Okay. And are you aware of the current IIFS for Kailua Stream? What is that?

A Status quo.

Q Okay. Moving on to Nailiilihaele, N-a-i-l-i-i-l-i-h-a-e-l-e Stream. Unit No. 6041. Have you been there?

A Yes.

Q How many times?

A 120. I'll just go with nice round figures.

Q Okay. And is that also because it's easily accessible?

A Easily accessible, yeah. It's right next to Kailua. So I tend to visit both, one right after the

other.

Q I see. Okay. And what is the current IIFS for Nailiilihaele?

A Status quo.

Q Okay. And what about Puehu Stream? That's P-u-e-h-u. Unit No. 6042? Have you been there?

A Only from the highway. I spent -- well, no, I take that back. Probably been four times in total if you don't include from the highway.

Q What do you mean don't include from the highway?

A Well, the stream is visible from the highway, but there is no diversion from the highway. It's downslope from the highway a ways and it's not easily accessible. So I drive past it quite regularly, but I don't stop. So not from the highway, but at other times I've been to other locations other than the highway on the stream.

Q I see. Thank you for clarifying.

Okay. And what is the current IIFS for Puehu?

A Status quo.

Q The next one `O`opuola. That's O-o-p-u-o-l-a. And I'll just note that I'm not using any of the diacritical marks right now. And that's Unit No. 6043. Have you been there?

A Yes.
Q How many times?
A 120.
Q Okay. And is that because -- how many times for work?
A 120. Well, 119. I don't know actually. Let's call it 120.
Q It's approximately 120?
A Yeah, approximately.
Q Okay. And what is the current IIFS for `O`opuola?
A Status quo.
Q The next stream is Kaaiea. K-a-a-i-e-a. No. 6044. Have you been there?
A Yes.
Q How many times?
A Four times.
Q Okay. And have you been there for work purposes?
A Yes.
Q When was the last time?
A In July.
Q Of this year?
A Yeah. Actually I went there also in August. Sorry. August 3rd.

Q Sorry. You were in East Maui in August of this year? Like --
A Last -- yeah.
Q What were -- okay. And what day was that or when was that?
A August 3rd.
Q Okay. Was that for work purposes?
A Yes.
Q Okay. And you visited Kaaiea and others, I assume?
A Yes.
Q Okay. All right. And what is the current IIFS for Kaaiea?
A Status quo.
Q Punaluu is the next. P-u-n-a-l-u-u Stream. No. 6045. Have you ever been there?
A Yes.
Q And how many times?
A Once.
Q Okay. And was that for work or pleasure?
A Work.
Q When was that approximately?
A The 3rd of August.
Q Okay. This year; correct?
A Yeah.

Q Okay. How about Kolea? I'm sorry. Sticking with Punaluu for a moment. Prior to your first visit there in August, were you otherwise familiar with this stream already?

A Yes.

Q How so?

A Through previous site visit reports and documentation.

Q Okay. And have you ever analyzed any data regarding this stream in the course of your job?

A Yes.

Q Okay. And have you ever seen a representation of any of the diversion structures --

A Yes.

Q -- on this stream? Okay. Okay.

So moving to Kolea. That's K-o-l-e-a Stream.

Oh, I forgot to ask you what the IIFS was for Punaluu. I apologize.

A Status quo.

Q Thank you. Okay. Kolea. K-o-l-e-a. 6046. Have you been there?

MR. FRANKEL: Objection. Vague.

THE COURT: I'll allow it.

MR. FRANKEL: I just want to make sure we have clarity on the streams. I'm going to say vague.

THE COURT: It's Kolea Stream. What more are you asking for?

MR. FRANKEL: Well, there's two Kolea Streams, Your Honor, so I want to make sure we have clarity on that.

MS. GOLDMAN: If I may, that actually is the reason for providing the Court and the record today with these hydrologic unit numbers. And Dr. Strauch will talk more about that later, but I believe that should be enough clarity for now.

THE COURT: Go ahead.

BY MS. GOLDMAN:

Q Okay. Okay. So have you been there?

A Yes.

Q How many times?

A Four times.

Q Okay. And have you been there -- were those four times for work?

A Yes.

Q Are you familiar in any way with the diversion structures on that stream?

A Yes.

Q How so?

A I have been to them and I have seen historical documentation as well.

Q Okay. Thank you. All right. Moving on to the next one -- oh, and what was the IIFS, the current IIFS for that stream?

A Status quo.

Q Okay. Moving on to the next one, Alo, A-l-o. It's in the Waikamoi Hydrologic Unit 6047. Have you been there?

MR. FRANKEL: Objection. Vague. I'm sorry. Are we talking about streams or tributaries? I just want clarity here.

MS. GOLDMAN: At the moment we are talking about streams and some tributaries that are important enough to be assigned hydrologic unit numbers.

THE WITNESS: There are no tributaries that are themselves hydrologic unit numbers.

BY MS. GOLDMAN:

Q Okay. Thank you. And what is -- what is Alo a reference to? That's A-l-o.

A It's a tributary of Waikamoi.

Q And is that one of the petitioned streams in your knowledge?

A Yes.

Q And was that considered separately from Waikamoi in the 2018 CWRM decision?

A No.

Q Okay. Thank you.

Moving on to Waikamoi, W-a-i-k-a-m-o-i, in Unit No. 6047. Have you been there?

A Yes.

Q How many times?

A About 120.

Q Okay. When was the last time?

A In July.

Q Okay. Had you been there prior to 2018 or --

A Yes.

Q Thank you. And are you aware of the current IIFS for Waikamoi Stream?

A It is the H-90 flow, which --

Q Okay.

A -- I don't remember off the top of my head the actual number value, but it's in the decision and order.

Q Okay. Thank you. We'll return later to have you just explain to us what an H-90 flow is, but for now, thank you. Are you also familiar with any or all of these diversion structures on Waikamoi Stream?

A Yes.

Q How are you familiar?

A From personal site visit knowledge as well as historic documentation.

Q Okay. Thank you. Okay. So the next one is

Puokokamoa (sic). That's P-u-o-k-o-k-a-m-o-a (sic). It is No. 6048.

MR. FRANKEL: Objection. Assumes facts not in evidence in terms of being the next one.

THE COURT: Well, it's the next one she's asking about.

MR. FRANKEL: Okay. I think she's trying to go in geographic order. And I think --

THE COURT: I'll allow it.

MR. FRANKEL: I'm just trying to help out a little bit here.

MS. GOLDMAN: That's fair.

THE COURT: Just go ahead.

MS. GOLDMAN: Okay. I can just -- the next hydrologic unit normal is 6048 and the stream that I previously spelled the name of.

BY MS. GOLDMAN:

Q Yes. Have you been there?

A I think --

Q Puokokamoa --

A To solve this problem, the next hydrologic unit is Wahinepe`e.

Q Okay. Thank you.

THE COURT: Time out. We're too often stepping on each other's speaking. Okay. I think it's

probably because you're trying to speak slowly for our court reporter, which is great. The witness is anticipating where the question is going and sometimes jumping in, sometimes not. And then while the witness is answering, then you're sometimes jumping in before he's completely finished. So -- and that's totally normal conversation, so none of what I'm saying right now is a critique. It's just we need to not do it that way out of courtesy to our court reporter. So everybody, just try to turn off the normal conversation methods that we all engage in all the time to kind of move the talk along. We don't want to do that here. We want to take it nice and slow and one at a time to make our court reporter's job easier. So thank you very much. Go ahead.

MS. GOLDMAN: Okay. Understood. Thank you, Your Honor.

BY MS. GOLDMAN:

Q Okay. So Puokokamoa Stream. 6048. Have you been there?

A Yes.

Q How many times?

A 40?

Q Okay. And had you been there prior to November 2018?

A Yes.

Q And are you familiar with any of the diversion structures on that stream?
A Yes.
Q How?
A From personal site visit knowledge and historical documentation.
Q Okay. Okay. Moving on to Unit 6049. Stream named Ha`ipua`ena. That's H-a-i-p-u-a-e-n-a. Have you been there?
A Yes.
Q How many times?
A 40 or so approximately.
Q Okay. And when was the last time?
A August 3rd.
Q Okay. Of this year?
A Yes.
Q And had you been there prior to November 2018?
A Yes.
Q And are you personally familiar with any of the diversion structures on that stream?
A Yes.
Q How?
A From field work, personal experience.
Q Okay.
A Course work documentation.

Q Okay. Thank you. And are you aware of the current IIFS for that stream?

A Yes.

Q How -- pardon. Rather than the exact number, can you -- is there a characterization you can give to that IIFS?

A That is the connectivity -- that is one of the connectivity flow streams.

Q And I forgot to ask you I think with respect to the previous stream in Unit No. 6048. What was the IIFS for that stream?

A That is also a connectivity flow stream.

Q I'll have you explain that term later.

THE COURT: Excuse me. So we're going to take our break now. We'll go -- we'll go ten minutes. So I'll see you at 11:22. All right? We're in recess. Thank you.

MS. GOLDMAN: Thank you, Your Honor.

(A recess was taken.)

THE COURT: We're back on record. FTR on?

THE CLERK: Yes.

THE COURT: Ready to go. Go ahead, Ms. Goldman.

MS. GOLDMAN: Thank you, Your Honor.

BY MS. GOLDMAN:

Q Dr. Strauch, the next number on the list was 6050. That's Punalau, slash, Kolea Stream. P-u-n-a-l-a-u. Actually it's called Punalau Stream.

And perhaps you should help explain to the Court the confusion about Kolea that Mr. Frankel was just referring to comes from. Oh, you're muted.

A Sorry. Kolea is the main tributary of Punalau. So in the higher elevations it is referred to as Kolea, but the lower to middle reach of the stream is called Punalau.

Q Okay. And for our purposes here today, is it all right if we just refer to Kolea as the other stream we spoke about and we'll just refer to this one as Punalau?

A Yes.

MR. WYNHOFF: Your Honor, this is Bill Wynhoff. I'm really sorry to interrupt my own colleague. The reason I came in late is I was just talking to Glenn Higashi, and he said that he's sort of, you know, two or three degrees of separation away from some COVID person. So he doesn't want to go to his office. He doesn't want to come here.

I think we can -- you know, I completely respect Mr. Schulmeister's absolute right to cross-examine him. I don't know if Mr. Schulmeister is going

to need a bunch of exhibits. If so that might not be possible. I don't think any of us has a problem right now. As a courtesy, I just want you and everybody to know so that we can start to think about it.

And again, I apologize, Your Honor, particularly to my colleague, Ms. Goldman.

THE COURT: That's fine. We can address that later, but it's good to have the heads up.

Go ahead.

BY MS. GOLDMAN:

Q Punalau Stream, Dr. Strauch. Have you been there?

A I have.

Q How many times approximately?

A 120.

Q And were those for work?

A Yes.

Q When was the last time?

A I was there on August 3rd.

Q Okay. Was this one of the streams addressed in the 2018 decision and order --

A Yes.

Q -- by CWRM?

What kind of -- was it given a restoration status of any --

A Yes.
Q What --
A The H-90 flow.
Q Are you familiar with any individual diversion structures on that stream?
A I am.
Q And how -- how are you familiar?
A Personal site visit and historic documentation.
Q The next stream is Honomanu, No. 6051. It's H-o-n-o-m-a-n-u. Have you been there, Dr. Strauch?
A Yes.
Q How many times?
A About 120.
Q When was the last time?
A Mid-July.
Q Had you been there prior to November 2018?
A Yes.
Q Are you familiar with any of the diversion structures on that stream?
A I am.
Q How?
A From personal site visits and historic documentation.
Q And are you aware of whether that stream was

given a new IIFS by the CWRM in 2018?

A Yes, it was.

Q And what kind of IIFS was it given?

A An H-90 flow.

Q The next stream is Nua`ailua, 6052. That's N-u-a-`-a-i-l-u-a. Have you been there?

A Yes.

Q How many times approximately?

A 40.

Q Okay. Were those all for work?

A Yes.

Q When was the last time?

A July. Sorry. Mid-July 2020.

Q Was that stream -- did the CWRM set a new IIFS for that stream in 2018?

A Yes.

Q What kind of IIFS was it?

A Connectivity flow.

MR. FRANKEL: Your Honor.

THE COURT: Yes, sir.

MR. FRANKEL: Can I ask -- can I stipulate that Ms. Goldman can ask leading questions for the remainder of this foundation to make it much faster?

THE COURT: Yes. Thank you.

MS. GOLDMAN: Thank you, Mr. Frankel.

BY MS. GOLDMAN:

Q The next stream is 605 -- excuse me. 6053. Pi`ina`au. P-i-`-i-n-a-`-a-u. Dr. Strauch, have you also been here for work many times?

A Yes. Approximately 120 times.

Q Okay. And are you also familiar with diversion structures on this stream due to your own personal observations?

A Yes.

Q Are you also familiar with them from your review of historic data?

A Yes.

Q Are you aware of the IIFS status?

A Yes.

Q What is it?

A Full restoration.

Q When was that done?

A In the 2018 decision and order by the Water Commission.

Q Okay. The next stream has the same number, 6053. It's called Palauhulu, P-a-l-a-u-h-u-l-u. You been there?

A Yes.

Q How many times?

A 120 times.

Q For work; right?
A Yes.
Q And that stream was the subject of a new -- the recipient of a new IIFS determination in 2018; right?
A Yes.
Q And it was restored to full restoration status; is that right?
A Yes.
Q Thank you. And you are personally familiar with the diversion structures existing on that stream?
A Yes.
Q And you are also familiar with those structures due to historical data and your review -- your review of historic data?
A Yes.
Q Next stream, 6055 on our list, or on the list that we are going down right now. Waiokamilo, W-a-i-o-k-a-m-i-l-o. You are also familiar with this stream from work?
A Yes.
Q How often have you been?
A 40 times approximately.
Q And you are also personally familiar with the diversion structures currently existing on this stream; correct?

A No.
Q No? Are you familiar with them in any way that's not based on your personal observation?
A Yes. Through historic documentation. The diversions were discontinued prior to my arrival at CWRM. And I assume you're referring to the East Maui Irrigation diversions, not the community diversions, which I am also familiar with from personal experience.
Q Thank you for the clarification, Dr. Strauch. Yes. That was the question. Okay. Have you been to Wailuanui, No. 6056?
A Yes.
Q How many times?
A About 120 times.
Q Those were for work; right?
A Yes.
Q Are you personally familiar with any of the diversion structures there?
A Yes.
Q Are you also familiar with the historic data?
A Yes.
Q What is the restoration status of Wailuanui?
A Full restoration.
Q And excuse me. That was the IIFS determination; correct?

A Yes.
Q When was that determined?
A In the 2018 decision and order.
Q Next, 6057, West Wailuaiki. That's W-a-i-l-u-a-i-k-i. You've been to West Wailuaiki; right?
A Yes.
Q You've been there for work; right?
A Yes.
Q How many times?
A About 120 times.
Q You are personally familiar with diversion structures on West Wailuaiki Stream that are diversions into the ditch system for A&B, EMI that is the subject of this matter; correct?
A Yes.
Q What is the IIFS for West Wailuaiki?
A Full restoration.
Q When was that determined?
A In the 2018 decision and order.
Q Next we have 6058, East Wailuaiki, same spelling. W-a-i-l-u-a-i-k-i. You've been there?
A Yes.
Q How many times?
A About 120 times.
Q You're familiar with it from your work;

correct?

A Yes.

Q And you are personally familiar with the diversion structures on East Wailuaiki Stream; correct?

A Yes.

Q As qualified by my previous statement regarding --

A Yes.

Q Okay. What is the restoration status -- or pardon me. What is the IIFS for East Wailuaiki?

A H-90 flow.

Q When was that set?

A In the 2018 decision and order.

Q To your knowledge, why -- or we'll come back to this actually.

The next stream is 6059, Pua`aka`a. That's P-u-a-`-a-k-a-`-a. No. 6059. You're familiar with this stream; correct?

MR. FRANKEL: Objection. Assumes facts not in evidence.

THE COURT: What? That it's a stream?

MR. FRANKEL: Correct, Your Honor.

THE COURT: All right.

MR. FRANKEL: It's a tributary.

THE COURT: If you could rephrase.

MS. GOLDMAN: Okay. Thank you, Your Honor.
BY MS. GOLDMAN:
Q Pua`aka`a Tributary. Dr. Strauch, have you been there?
A Yes.
Q How many times?
A Four times.
Q Had you been there prior to November 2018?
A Yes.
Q And you are personally familiar with the diversion structures, the relevant diversion structures on that tributary; correct?
A Yes.
Q And that tributary was -- had a new IIFS set in 2018; correct?
A Yes.
Q And the restoration status was connectivity status; right?
A Yes.
Q 6059 again. This stream is called Kopiliula. K-o-p-i-l-i-u-l-a. You've been there; right?
A Yes.
Q How many times?
A About 120 times.
Q Those were for work; correct?

A Yes.
Q Are you personally familiar with the diversion structures on Kopiliula Stream?
A No.
Q Are you aware of the diversion structures on that stream?
A Yes.
Q How so?
A Oh, wait. Sorry. I was mixing them up in my mind. I have them to the Kopiliula Intake. Ko`olau Ditch, yes.
Q Okay. And are you also familiar with diversion structures besides from your personal observations?
A From historic documentation, yes.
Q Kopiliula also received a new IIFS as of 2018; correct?
A Yes.
Q That was H-90? It was restored to H-90 flow; correct?
A Yes.
Q Next, No. 6060. Waiohue. W-a-i-o-h-u-e. You've been there; right?
A Yes.
Q This is Waiohue Stream; right?

A Yes.
Q How many times have you been there?
A 80 times.
Q And that was for work; right?
A Yes.
Q And you are personally familiar with diversion structures on Waiohue Stream; correct?
A Yes.
Q Are you also familiar with calculations and historical data regarding that stream?
A Yes.
Q Is that awareness something that you gained in the course of your job?
A Yes.
Q Waiohue Stream was fully restored by decision and order in 2018; is that right?
A The IIFS was full restoration, yes.
Q Thank you. Next, Pa`akea. That's 6061. And it's spelled P-a-`-a-k-e-a. You've been there?
A Yes.
Q How many times?
A Once.
Q Was that prior to November 2018?
A Yes.
Q Was -- are you personally familiar with the

diversion structures?

A Yes.

Q Okay. The 2018 CWRM decision set a new IIFS for Pa`akea; correct?

A Yes.

Q That restoration status was connectivity; right?

A Yes.

Q Next, 6061, Puakea Stream. P-u-a-k-e-a. Have you been there?

A Yes.

Q How many times?

A One time.

Q And was that prior to November of 2018?

A Yes.

Q Are you personally familiar with the diversion structures or structures on Puakea Stream?

A Yes.

Q What is the current IIFS for Puakea?

A It does not have one, I don't think.

Q By that do you mean that it has the status quo --

A Sorry. Yes.

Q Just to clarify. And which hydrologic unit is that stream in?

A Puakea is in the Pa`akea hydrologic unit.
Q Next --
A It's a tributary of Pa`akea.
Q Thank you for clarifying.
6062, Waiaaka. W-a-i-a-a-k-a. What's that?
A You mean --
Q Is it a stream?
A Yes.
Q That's what I meant.
A It is a stream.
Q Okay. Have you been there?
A Yes.
Q How many times?
A About a dozen.
Q Were any of those times from prior to November 2018?
A Yes.
Q Was Waiaaka one of the petitioned streams before CWRM in 2018?
A Yes.
Q And did the CWRM set a new IIFS for that stream?
A It set a quantifiable number at the highway, yes.
THE COURT: I don't understand what you mean

by that.

THE WITNESS: There is an IIFS, yes.

BY MS. GOLDMAN:

Q Okay. That IIFS is not, however, full restoration; correct?

A Correct.

Q And it's not H-90; right?

A Correct.

Q And it's not connectivity status; right?

A Correct.

Q Thank you. 6063, Kapaula, K-a-p-a-u-l-a. Have you been there?

A Yes.

Q Is that a stream or a tributary?

A That's the name of the main stream.

Q How many times have you been there?

A About a dozen times.

Q Those times were for your current job; correct?

A Yes.

Q And you had been there prior to November 2018; correct?

A Yes.

Q And you are personally familiar with diversion structures relevant to this case on Kapaula Stream?

A Yes.
Q And that stream received a new IIFS from the CWRM in 2018; right?
A Yes.
Q And that stream's new IIFS was designed to restore it for connectivity; correct?
A Yes.
Q Next, 6064. Hanawi. That's H-a-n-a-w-i. I believe with the kahako. Have you been there?
A Yes.
Q How many times?
A About 60 times.
Q Are you -- those times were for work; right?
A Yes.
Q And you are personally familiar with some or all of the diversion structures relevant to that stream; correct?
A Yes.
Q I would just clarify the previous question by saying the diversion structures we're referring to are the ones that lead into the A&B EMI ditch system; correct?
A Yes.
Q Maka -- oh. The CWRM set a new IIFS for Hanawi in 2018; right?

A Yes.
Q Hanawi was restored for connectivity; right?
A Yes.
Q Makapipi Stream, 6065. M-a-k-a-p-i-p-i. You're familiar with Makapipi; right?
A Yes.
Q Okay. How many times have you been there?
A About 60 times.
Q Those are for work; right?
A Yes.
Q Are you also personally family with the diversion structures on Makapipi Stream?
A Yes.
Q With some or all of those structures?
A Yes.
Q That stream was given a new IIFS in the 2018 decision by CWRM; correct?
A Yes.
Q That stream, Makapipi, was restored fully or it was full restoration was the intent of the new IIFS; correct?
A Full flow restoration; correct.
Q Full flow restoration.
And Makapipi -- is that the last stream before -- before -- is that the end of the ditch system

basically?

A Technically it's the start of the --

Q Thank you. Okay. Well, it marks one end; correct?

A Yes.

Q Thank you. And just for everybody in the courtroom, we are going to skip -- (inaudible).

Okay. Okay. Earlier you talked about -- earlier you talked about part of one of your job duties, you're involved in gauging and monitoring these streams; correct?

A Correct.

Q Tell us what kind of work you do to that end.

A So we monitor instream flow standards below stream diversions where the Commission has established instream flow standards or interim instream flow standards.

And we monitor in a few occasions natural flow, whether it's used as an index station or the flow of water above a diversion. And in this capacity we survey in the equipment, the datum. The datum is a point of reference. It's a fixed point that the elevations are taken from. We survey in a staff plate, which is essentially a ruler in the stream to measure the elevation or the height of the water in the stream. We

then install equipment to monitor as in log or record the elevation. And sometimes that equipment can communicate via satellite or cellar network. But most of the time because of expenses, we include or we install data loggers that have to be manually downloaded.

The stage, however, of the stream doesn't tell us the flow rate. Flow rate has to be converted using what's called a rating curve. And we develop a rating curve by taking flow measurements across a range of flow conditions, from low flow to high flow, in order to develop a mathematical model to convert the elevation of the water to flow.

Now, this --

Q Okay.

A -- rating curve --

Q I'm sorry. May I stop you there to just clarify for all of us what some of those terms mean. You used a lot of really big terms right there or just terms that I believe are not common knowledge to non-scientists. What is a stage?

A The elevation of the water above a datum.

Q Why is that important?

A Because as water flow, which is a three-dimensional concept, increases or decreases, the elevation in the water changes. And we don't have the

technical capability to monitor three-dimensional flow in natural conditions such as Hawaiian streams. So we have to monitor the elevation of the water one-dimensional and we convert that into flow. It's just a limitation of the technical ability to monitor.

Q Okay. You said that monitor -- or that flow is a 3D concept. Can you explain that a little further.

A So technically it's 4D because it's a volume per second or per unit of time. In the Commission's case, they often establish instream flow standards per day. So it's like a unit called million gallons per day. But in -- the standard form -- the standard methods that the U.S. Geological Survey and the Water Commission staff use on a daily basis is called cubic feet per second. They can be converted interchangeably. Irrigation operators often use acre feet. It's another unit. So it's -- you know, flow is three-dimensional. It's widths, depths, and height. And it's width, depths, and length and then unit time.

Q Okay. Thank you. What does the flow of a stream tell you?

A It's the amount of water moving in a stream channel.

Q And that's throughout the whole stream or what --

A At a specific location.
Q What goes into setting up a gage?
A Well, as I just described, you have to establish a datum. So in a global setting, the datum is relevance to mean sea level, but it's not relevant to measure elevation of tiny changes in elevation of water relative to mean sea level. So you establish what's called a local datum, and that is a point of reference.

You see these frequently with surveyors. They establish datums on bridges or in other areas. You'll actually find U.S. Geological Survey datums spread throughout the state. Those are other datums.

But for a gaging station, a datum is established, and then you install other points of reference that are in fixed places, that hopefully don't move because we have dynamic streams that are constantly eroding. And so the movement of large boulders or structures that might affect the conditions in the stream -- you want to not place your datum or reference points on those. You want them stable.

Q You just sort of touched on it. But how else do you figure out where to physically put the gage?
A So the actual data logger and staff plate need to be in a section of the stream channel that has a good control point, which is a reference of zero flow or an

elevation of zero flow.

And you want a -- what we call a gage pool. So it's a part of the stream channel that has consistent changes in elevation with changes in flow that makes developing a reading curve easier.

Q Pardon.

A Sorry.

Q Continue.

A And then you install the data logger or the pressure transducer equipment in the gage pool and site it in reference to the staff plate and the datum.

Q Do all streams have good areas to monitor?

A Not in the case of Hawaii. We have a lot of difficult conditions in the field that make monitoring challenging. This includes rapidly eroding watersheds, watersheds that have gaining and losing reaches that make measurements difficult relative to the equipment. We just also have access issues. So there might be a great place to monitor a thousand feet or at a thousand foot elevation, but to get there -- I mean, we're limited by the availability of roads and trails. And for helicopter landing zones, for example.

Q Okay. And what is the purpose of taking these measurements aside from, as you previously said, measuring the amount of water at any given time?

A So what is the purpose of the data?
Q Yes.
A So the data are used to establish how -- how much flow is in the stream over a period of time before ensuring that interim instream flow standards are being adhered to but also for monitoring natural flow conditions. So what is the variability of flow at a particular location.
Q How many gaging stations do you maintain statewide?
A The Water Commission maintains?
Q Yes. Thank you for clarifying. How many gaging stations does the Water Commission maintain?
A I think 42, off the top of my head.
Q How many are on Maui? On the Island of Maui? Approximately.
A Approximately 20, 22. Somewhere around there.
Q Approximately how many of these are located within this particular licensed area?
A Approximately 12.
Q And of those approximately 12, how many needs to be visited in person to retrieve the data?
A All of them.
Q And who does that?
A Me.

Q How often do you do that?
A At least quarterly.
MS. GOLDMAN: Your Honor, I notice that it is 11:58 a.m., and I was going to move to an exhibit. So perhaps this would be a good time to break?
THE COURT: That's fine. Let's go off record for a second.
(A recess was taken.)
THE COURT: We're back on record. FTR on?
THE CLERK: Yes, it is.
THE COURT: Ready to go?
MR. FRANKEL: I think there that's one thing that we wanted to put on the record. Mr. Schulmeister?
THE COURT: Go ahead.
MR. SCHULMEISTER: Yeah. I've given the -- I wanted to make everyone's life a little easier. So I've decided -- I looked over what I was going to talk to Mr. Higashi about, and I've decided I can waive that.
THE COURT: Okay. So we're not going to --
MR. SCHULMEISTER: Rather than force him to come in.
THE COURT: That would mean no one's going to recall him?
MR. SCHULMEISTER: Unless somebody else wants to. But I'll waive recalling him.

THE COURT: Okay.

MS. GOLDMAN: Your Honor, I don't know that we made 100 percent final decision on that, but yes, we do not believe we will be calling him.

THE COURT: Okay. We'll just leave it at that for now. Thanks for the heads up though. That's helpful.

All right. We ready to go with -- I'm sorry. Do you go by mister or doctor or what do you prefer?

THE WITNESS: It's usually Ayron, but Dr. Strauch works too if someone wants to try and pronounce my last name.

THE COURT: I will refer to you as Dr. Strauch unless you tell me otherwise.

THE WITNESS: Okay.

THE COURT: Ready to go, Ms. Goldman?

MS. GOLDMAN: Yes, Your Honor.

THE COURT: All right.

MR. WYNHOFF: Your Honor, Bill Wynhoff here again. Hi. Susan Case said she just got done and might be on any minute now.

THE COURT: That's good. Thanks.

MS. GOLDMAN: Thank you.

THE COURT: Go ahead.

BY MS. GOLDMAN:

Q Before the lunch break, Dr. Strauch, we were talking about stream gaging and your work in monitoring the streams. You mentioned that there were a dozen gages approximately in the licensed area at issue here. Is that right?

A That CWRM maintains; correct.

Q That CWRM maintains. If money was no object, would CWRM maintain a gage on every stream?

A No because in terms of instream flow standard compliance, some of the instream flow standards can be complied with without constant monitoring.

In terms of natural flow conditions, the natural flow conditions are monitored by U.S. Geological Survey through a cooperative agreement with us. And those flow conditions are monitored throughout the area. And the conditions that occur in one stream are equivalent to conditions that are occurring in neighboring streams. So it would be redundant to monitor every stream.

Q Okay. So just to clarify, so if money and resources were absolutely no object, would it still be redundant?

A Correct.

Q Okay. In this data -- what happens to the data that you 're collecting from the gaging station?

A So the Commission collects I guess three types of data. First we make flow measurements. So that's a point-in-time measurement of how much water is moving through the certain channel. Then we collect stage data that are recorded on the data loggers that are the equipment that we install in the stream. And then we convert the stage data using a rating curve that we develop into flow. That flow data gets compiled. Generally decisions get made based on mean daily flow values. And that data then gets historically uploaded to the CWRM website.

We are currently in the works of developing a geoportal that gives the public more access to the raw data, which our IT capabilities are somewhat limited so we can only publish the processed data in PDF format at the moment.

Q So the gaging data that you collect from this East Maui area is currently available to the public online?

A Much of it is, yes.

Q And even if resources were no object, you would not -- I withdraw that question actually. How do you verify that an IIFS is being met?

A By doing point measurements again and by analyzing the data recorded in the date loggers to verify

that the minimum amount of flow is occurring over a period of time. And then we compare that data to natural flow conditions at index stations, which are representative of the hydrology of the point of interest.

Q Talk a little bit more about index stations please for just a moment.

A So index stations are long-term continuous monitoring stations that the USGS maintains with CWRM as a cooperative agreement. USGS stands for U.S. Geological Survey. They are the agency, the federal agency, charged with monitoring hydrological resources in the United States.

And through a cooperative agreement, we maintain index stations in East Maui to provide us with realtime information that is relevant to both our instream flow standard analysis, but also to the general public for flooding issues, for long-term analysis of hydrological conditions, these sorts of things.

Q Okay. And in working with the USGS to maintain this data, where is all of this data stored?

A In the publicly available database, another geoportal. The easiest way to access those are through our website. We have a link or actually a page on our website that presents the most up-to-date information across the state. But then it is also accessible to the

federal government's geoportal.

And the reason why we maintain this database of index stations is because the Water Code specifies that within the Hawaii water plan, the Water Resource Protection Plan identifies the need to monitor hydrological resources across the state to make sound management decisions. So it falls on the Water Commission to fund the statewide network of hydrological monitoring stations.

Q So would you say in your understanding the members of the Board of Land and Natural Resources know that CWRM is collecting this data?

MR. FRANKEL: Objection. Calls for speculation, lacks foundation.

THE COURT: I'll allow it. It's his understanding.

MR. FRANKEL: Whether they know?

THE COURT: Just if they know that data's being collected. That's all. His understanding.

THE WITNESS: So this is --

THE COURT: He's here in front of me, so I might as well find out.

THE WITNESS: These are the -- these data sources that USGS gather, whether it's rainfall, streamflow, ground water levels, are relative to a

variety of agencies and the public. And they're relied upon by everybody as a source of information. So I would -- I mean, it is my understanding that the agencies that are interested in water resources would go to these websites.

BY MS. GOLDMAN:

Q What --

A Which include the state Commission on Water Resource Management's own website.

Q What other agencies do you personally have experience working with this data?

A We work with U.S. Fish and Wildlife Service, USDA Forest Service, other members of the USGS, the University of Hawaii, the Division of Aquatic Resources, Land Division, even SHPD in some cases, state parks. Maui County at a number of different levels, Hawaii County. Actually each county agency. The Big Island.

Q You used an acronym SHPD. If you could state what that means --

A State Historic Preservation Division. It's the agency -- it's the division within DLNR that's charged with historic preservation.

Q Okay. So you work with federal organizations as well as with various divisions within DLNR on some of these monitoring?

A And nonprofit divisions as well or nonprofit agencies.

Q And if A&B, EMI was not honoring the IIFS, how would you know?

A We would look at the data and it would show that the flows at that particular location, which should be at value or not at value.

Q So let's break this down a little bit. So if in your evaluation you notice that a flow does not appear to be meeting the IIFS, what do you do?

A The first thing we do is we look at natural hydrological conditions. So in some cases, the IIFS is set at a flow that occurs 90 percent of the time. So in -- a flow duration occurs, which is a mathematical representation of the magnitude of flows that occur over a given period of time.

A flow that occurs 90 percent of the time or the Q 90 flow is a relatively low flow. That means only 10 percent of the time is there not that amount of water naturally in the stream.

However, we have to figure out if that 10 percent of the time is occurring or not. And that's why we use index stations.

Q And what -- what would be the procedure if you did determine that low flows were due to negligence or

some reason related to EMI and A&B's diversions of the water?

A We would do a couple of things. One, we would formulate -- we would have an internal conversation about the next steps to take, and then we would formulate a notice of violation letter. And that goes through the Regulations and Preventing Section. And then that would get sent to A&B. We would probably also communicate that to A&B that we were formulating this notice of violation.

Generally speaking, outside of this situation that we're talking about, we've had complaints about instream flow standards not being met. And so we would engage with the person or entity making the complaint as well.

Q And if a complaint is made and you have reason to suspect some kind of violation and you send one of these notices of violation, is it your understanding that the Board of Land and Natural Resources would be aware?

A We would consult with the Land Division as well and, therefore, the Board.

Q Okay. What is a ratings curve? You've mentioned it a few times.

A The rating curve is the mathematical formula that allows us to convert the stage or height of flow in a stream to a flow rate. So either cubic feet per second

or million gallons per day.

Q What does such a measurement tell you?

A It allows us to convert the staged data recorded by the data logger into flow.

Q What is base flow? What does that term mean?

A Base flow tends to be considered, especially here in Hawaii, the ground water contribution to streamflow. The ground water contribution can be high elevation ground water or it can be base flow ground water. But it's generally the ground water contribution to streamflow.

Q And are there any diversions that capture 100 percent of base flow?

A Most of them do.

Q Okay. What's an example -- or excuse me. Are you aware of any diversions in the East Maui area that collect 100 percent of base flow?

A Yes. And can I qualify my previous answer with, I assume you're referring to this region, East Maui, when you asked do diversions take 100 percent of base flow.

Q Yes, I was. Thank you for clarifying. How can you tell that a diversion is designed to capture 100 percent of base flow?

A Based on the geometry and the structure.

Q What's an example from the East Maui area of a type of diversion that's designed to capture 100 percent of base flow?

A The intakes on Hoolawa nui or Hoolawa lii lii are where the grate is across the entire stream channel but allows the base flow to drop into a collection basin that then is connected to the ditch.

Q So if 100 percent of base flow is captured, does that mean that 100 percent of all water is captured?

A No.

Q Why not?

A Streamflows here in Hawaii vary quite rapidly over time and across various orders of magnitude, which the diversions are designed to capture the low to medium flows because those are the stable flows. The higher peak flows, the freshets, occur bringing silts, gravel, debris, boulders in some cases downstream.

These are young volcanic islands that are rapidly eroding. And we have a steep elevational gradient in which orographic rainfall, so the rainfall that the trade winds bring. I'm trying to not use technical terms. I'm sorry. We have big rain events frequently, especially during wet seasons, but also on other parts of the islands during dry seasons due to various climactic factors. And these storm events cause

tremendous amounts of rainfall and runoff which transports sediment, debris.

The operation of the irrigation system is designed to not capture the -- it takes a lot of effort to keep these irrigation systems clean. And they don't want the rock, the debris, to end up in the irrigation system. So the --

Q (Indiscernible). By in the irrigation system, do you mean in the ditch?

A Yeah. Yeah. So the diversions themselves allow the boulders to either roll across them and therefore -- with the high flow events or the water buildup behind the dam and spills over during these high flow events and the gravel and cobble are sluiced through a sluice gate.

Either way, the bigger flow events that occur maybe 20 percent of the time, 30 percent of the time, depending on the individual stream and point of diversion, they continue downstream. So when a diversion is designed to capture up to a certain say 10 million gallons per day, all the flows greater than 10 million gallons per day continue downstream.

Q And you're saying that that is an intentional design feature designed to keep sediment and boulders, etc., out of these ditches?

A Correct. Also the ditch has its own maximum capacity, and when it rains and there's a lot of runoff, we're talking hundreds of times greater than the maximum capacity of the ditch itself. And so they -- they really don't want those big runoff events.

THE COURT: I need a clarification, Doctor. A little while ago you were talking about base flow and you used the -- you used the term ground water contribution. I think I know what that is, but could you make it completely clear for me?

THE WITNESS: Sure. So if you think of a -- if you took a cross-section, if you slice the island in half and you looked at it, we have basically two types of ground water. We have the basal lens, which is a lens-shaped water body that sits on salt water that is basically at sea level. It extends above and below sea level. But it's at the sea level elevation. That's called the basal lens. And then we have higher elevation water, and those are things like perched water bodies that occur because of what we call aquitards or geology prohibits the downward infiltration of water. We also have dike-impounded ground water. So we have vertical aquitards which impound water vertically.

And as a stream channel erodes, we get what's called incision. And the stream channel is -- this is

part of watershed geology. And as the stream erodes, we get incision. You can think about it like a V shape. Starts out a shallow V and then gets narrower and deeper and deeper. As that V intersects these high elevation ground water bodies, you get ground water spilling into the stream.

So it can be in the form of a spring on the side of the mountain. It could be a spring coming up in the stream itself. That's where you get ground water contributions. And it's all based on geology and age of substrate, and that sort of thing.

THE COURT: Got it. Thank you.

BY MS. GOLDMAN:

Q That was an excellent question. Thank you for clarifying that, Dr. Strauch.

Could you also please explain what surface water is -- what is meant by that term?

A Generally speaking, we have runoff and then we have ground water contributions to surface water. So the streamflow is a combination of runoff and ground water that's contributing to the stream.

Q Okay. So earlier you mentioned that capturing 100 percent of base flow doesn't necessarily mean 100 percent of all water is captured. Actually I'll withdraw that portion. What is a gaining stream?

A Gaining stream is a stream where as you move from high elevation to low elevation, there is more flow in the stream due to more ground water contributions to the streamflow.

So in a hypothetical situation, if it's really dry for say a week at a time, you know there's no runoff. In a gaining stream, it might start at 1,000 foot elevation and have 5 cubic feet per second in the stream channel. And you move down slope to the 800 feet elevation and you might have 7 cubic feet per second. You know there's no contributions from other surface water sources, no other tributaries flowing. There's no runoff flowing into the stream. But there's more water in the stream because of that increased ground water contribution.

Q Okay. And so you mentioned -- or let's just take a stream for an example. Let take Hoolawa Stream. What -- to your knowledge what is the highest elevation ditch that Hoolawa intersects with?

A Waialoa Ditch.

Q Okay. So hypothetically speaking, if a photograph showed that the ground here is dry immediately makai of a diversion, does that mean the rest of the stream will be dry?

A No. It depends on the specific tributary that

you're talking about, the size of the stream, the depth of the incision within the watershed.

So Hoolawa nui, for example, the larger tributary, if you move from -- if you move makai of the Waialoa Ditch intake a few thousand feet downstream, you will get ground water seeping down into the stream.

THE COURT: So before we move on, the record should show that before the doctor started to answer, Mr. Frankel was trying to interpose an objection, I believe, but he was muted. So -- as I promised before this trial started, I said I'm not going to hold that against anybody. So I'm going to keep true to that promise.

So go ahead and make your objection now and I will I apply it.

MR. FRANKEL: Thank you. I was going to object that it was calling for expert opinion because it was a hypothetical. His answer, however, towards the end was observational. But to the extent that the beginning part of his answer was providing opinion testimony, I move to strike.

THE COURT: All right. That's overruled.

BY MS. GOLDMAN:

Q So I think you may have touched on this, but I'm not sure how clear it was. What happens when there

is a freshet or one of those runoff events or flash floods that causes the amount of water to exceed the capacity of the diversion?

A There is continual flow downstream past the diversion.

Q And does this happen -- how often do these types of events happen?

A About -- well, it depends on the stream, it depends on the diversion, but back of the envelope, probably 30 percent of the time you get flows that exceed the capacity of any given diversion.

Q So by 30 percent of the time, you mean like in a ten-day period, three days on average would have a condition like that?

A No. I mean over a 30-year period, 30 percent of the time we'll have these conditions.

Q Okay. How do you know that it happens with regularity?

A Because we have both historic stream gaging data on many of these streams, but also current realtime data on the index stations that I mentioned. So we continue to gather these -- the frequency of peak flow events.

And -- and then our gaging stations that monitor instream flow standards, they obviously also

register all flows. I mean, they're monitoring 15 minutes -- every 15 minutes. And so when a stream is 8 feet deep, we're also reading 8 feet deep. I mean, we're just not as interested in it for management of instream flow standards.

Q Okay. Earlier you testified regarding your personal knowledge and your historical observations and analysis of various diversion structures located within this licensed area. To your knowledge, are there any diversion structures that you know of that do not ever get flushed out by storm water?

A If there's a structure in the stream, it would be designed to allow for the peak flow events to flow over it.

Q I think that means no.

A Not all diversions are structures in the stream.

Q Thank you for clarifying. So all diversion structures that are in the stream allow for freshets to pass over; correct?

A Yes.

Q Of these 13 streams that -- if I refer to 13 streams, do you know which 13 streams I'm referring to?

A Yes.

Q Of these 13 -- of those 13 streams, which ones

are gaining streams?

A Hoolawa.

MR. SCHULMEISTER: I would like to object. I'd like the record a little clearer. I don't need the names of the streams, but just some further description of the 13 streams would be useful.

THE COURT: That's fine. Go ahead.

MS. GOLDMAN: Understood.

BY MS. GOLDMAN:

Q To your knowledge, how many streams within this licensed area are still covered by a historical IIFS set at the status quo? In other words, how many did not have a new IIFS set or clarified in 2018?

A How many streams were gaining that don't have a 2018 established IIFS?

Q How many streams of the list that we earlier went through? How many of these did not have an IIFS set or clarified in 2018?

THE COURT: Yeah. Whether gaining or not.

BY MS. GOLDMAN:

Q Whether gaining or not. Yes.

A I think it's the 13.

MS. GOLDMAN: Is that sufficient? Okay.

BY MS. GOLDMAN:

Q How many of those 13 are gaining, or which

ones of those 13 are gaining streams?

A They all are.

Q Okay. How do you know?

A Because I've been to the streams during dry conditions at high elevations and during dry conditions at low elevations when they weren't being diverted and seen an increase in flow.

Q And when you made those observations, I assume you mean it was also not a flash flood event?

A Right. During dry conditions. Sorry. Climate and hydrologically, there was no runoff into the stream. So the observations were based on ground water gains. We also have USGS data on representative streams in this area that measure the -- quantified the gains and flow.

Q Just a moment, Your Honor. Thank you for your indulgence.

Earlier, Dr. Strauch, you mentioned I believe it was nine instream values; right?

A Yes. Defined by the state Water Code.

Q Thank you. Is one of those values -- did I get it right that -- sorry -- that one of those values include habitat for aquatic biota?

A Yes.

Q And if I understood you correctly, you are

mandated by the law to evaluate that type of data; correct?

A Yes.

MR. FRANKEL: Objection. Vague as to you.

THE COURT: Sustained.

MS. GOLDMAN: I'll clarify, Your Honor.

BY MS. GOLDMAN:

Q The CWRM. Not you individually.

MR. FRANKEL: Objection. Calling for a legal conclusion, lacks foundation.

THE COURT: I'll allow it as to this witness's understanding. I'm not going to take it as a binding legal decision.

THE WITNESS: So the Instream Use Protection Section is charged with carrying out the establishment of instream flow standards that protect the instream values as defined by the State Water Code. So as one of the nine instream values is aquatic habitat. We work closely with the Division of Aquatic Resources, Fish and Wildlife, and use all the available data to evaluate habitat for fresh water biota.

BY MS. GOLDMAN:

Q How is aquatic habitat quantified?

MR. FRANKEL: Objection. Lacks foundation, calling for expert testimony.

THE COURT: Hold on. Ms. Goldman, Mr. Wynhoff. We are wondering if -- where you guys all disappeared with the witness.

MS. GOLDMAN: I beg your pardon, Your Honor. We were just trying to get the witness set back up in my office.

MR. FRANKEL: No. He was sitting down.

THE COURT: Mr. Frankel, just take it easy. I can handle this. Okay?

MS. GOLDMAN: In an abundance of caution, we can assure the Court that we won't have any conversations relevant to this on any breaks or anything --

THE COURT: All right.

MS. GOLDMAN: -- of that nature.

THE COURT: Understood. But he will be subject to cross on that. So we'll see what happens.

MR. FRANKEL: Your Honor, can we get some assurance about what just happened?

THE COURT: You can ask him when it's your turn. Right now it's her examination. Okay?

Go ahead.

MS. GOLDMAN: Thank you, Your Honor.

BY MS. GOLDMAN:

Q Earlier, Dr. Strauch -- thank you for waiting, by the way. Earlier we talked about the stream

restorations ordered by the CWRM and we talked about two different categories that we didn't go into some detail about. Now I'd like you to tell us what those things mean. What is H-90 flow?

A So as I had mentioned before, we have what are called flow duration curves. It is the magnitude of flow that occurs for a given length of time or across a given length of time. So a Q 50 flow represents the median flow for say a 30-year period, from 1980 to 2010, for example.

An H-90 flow, by contrast, is the magnitude of flow that supports 90 percent of the habitat. So in various studies for East Maui specifically, the concept of restoring a particular amount of habitat was brought up within the contested case process. And the amount of flow that is necessary to restore 90 percent of the habitat was calculated as 64 percent of median base flow.

So I had just mentioned median flow. We -- that's related to total flow. Median total flow, which is the total amount of water available. Base flow is derived from a separate mathematical formula which isolates the base flow component or, as I mentioned earlier, the ground water component of total flow.

So 64 percent of median base flow provides 90 percent of the habitat for a stream as determined by

previous studies.

Q Dr. Strauch, is that a certainty? Is that something that everyone in the world agrees on? Or is that in question somewhat?

MR. FRANKEL: Objection. Calls for speculation.

THE COURT: Everyone? Really? Everyone in the world?

MS. GOLDMAN: I can withdraw. I'll withdraw that question, Your Honor.

THE COURT: Rephrase please. Thank you.

BY MS. GOLDMAN:

Q Dr. Strauch, your job -- how -- okay. Sorry. Dr. Strauch, you are responsible for monitoring these streams; correct?

A For monitoring the hydrology of these streams.

Q And in so doing, you are charged with determining whether it appears as though the IIFS is being followed or not; correct?

A I evaluate whether the IIFS is being met.

Q And on a stream with an H-90 flow, what is your understanding of how -- of how an IIFS would be met?

A It -- so the H-90 flow is the magnitude of flow. It's still a number that represents a flow rate. So cubic feet per day, a million gallons -- or cubic feet

per second, million gallons per day, for example. The IIFS is still a quantifiable value that can be determined by our monitoring. So we evaluate the data that we gather at our monitoring stations, whether the IIFS is being met, whether it's an H-90 flow or other.

Q Earlier you mentioned that you consult with other divisions of the BLNR with respect to the data you monitor and collect from the East Maui watershed; correct?

A Correct. So in our capacity we -- CWRM staff coordinate with other agencies. So in East Maui specifically, we coordinate with Division of Aquatic Resources to monitor stream biota. And 2008 to 2011, I believe, was the range of years in which the coordination occurred.

And then we coordinated with them to develop a follow-up study to understand whether H-90 was an effective method for restoring the ecological value of the stream. So I had mentioned that the Water Code defines specific instream values. And the ecological -- the aquatic ecology is one of those -- or the habitat for freshwater fish is one of those instream values.

Q And again, you are charged with balancing those instream values? You personally, and you personally in your professional capacity developing an

IIFS; correct?

MR. FRANKEL: Objection. Vague, compound, call calls for a legal conclusion.

THE COURT: Sustained.

THE WITNESS: May I finish?

MS. GOLDMAN: Yes, please. Oh, I apologize. You may not answer the question I just asked. I believe I may have cut you off. If you would like to continue that.

THE COURT: No. Time out. That question was objected to, so it cannot be answered. You need to rephrase it. I sustained.

THE WITNESS: She cut me off about the previous.

THE COURT: Let's just start over. Ask a question. Thank you.

THE WITNESS: So I was talking about the Division of Aquatic Resources.

BY MS. GOLDMAN:

Q Okay. What -- you mentioned two different collaborations, studies between DAR and CWRM; is that right?

A Correct.

Q Okay. The second one -- the first one you gave us some years. What about the second one? When was

that taking place?

A So as part of the decision and order, the Water Commission requested, they don't have authority over the Division of Aquatic Resources. The Water Commission requested in their decision and order that the Commission staff work with the Division of Aquatic Resources to evaluate whether the magnitude of flow that supports 90 percent of the habitat -- that quantity actually does support the ecosystem values that it was modelled to support. So the H-90 concept is a mathematical formula that is -- was developed by USGS using actual data from East Maui streams and tested across I believe six different streams.

But it has never been put into practice. And that is what the Commission's decision and order in 2018 when they established H-90 flows for two particular streams, Kopiliula and East Wailuaiki. They established fully restored streams in neighboring watersheds -- Waiohue and West Wailuaiki -- in order to test the effectiveness of the H-90 flow.

So as part of my job, I am coordinating with the Division of Aquatic Resources to evaluate -- to gather data and to evaluate the effectiveness of that management decision.

Q When you say expected use of H-90 flow, what

do you mean by that?

MR. FRANKEL: Objection to the extent it's calling for expert opinion.

THE COURT: I think that question is just too general, Ms. Goldman. I don't understand it. Please rephrase. Thank you.

BY MS. GOLDMAN:

Q You testified that you and -- that CWRM and DAR are consulting on this in order to determine the effectiveness of the H-90 flow.

A So --

Q What did you mean by that?

A I --

THE COURT: Time out. Please stop. Stop. Stop. Okay? We really have to take this one step at a time, folks. You asked a question, he started to answer, and then you started another question. Part of it is because of the video delay. I get it. So let's all just slow down a little bit and make sure we go one, then the other, then the other, then the other. Okay? That will save us a lot of trouble. Okay. So the question -- the question was -- could you please scroll back to the question.

The question is: You testified that you and -- that CWRM and DAR are consulting on this in order

to determine the effectiveness of the H-90 flow. What did you mean by that? That was the question.

Mr. Frankel, go ahead.

MR. FRANKEL: And I'm going to object. It's calling for expert testimony.

THE COURT: Ms. Goldman?

MS. GOLDMAN: Your Honor, it's asking for clarification of something that this witness just testified to that is well within his personal knowledge and is something that he is required to do as part of his job.

THE COURT: Okay. Well, my problem with the question is again, it's very general. The consulting to determine the effectiveness of the H-90 flow -- what did you mean by that? What exactly do you mean? Are you talking about the way they're consulting? Are you talking about H-90 flow? What are we talking about?

MS. GOLDMAN: No, Your Honor. I was attempting to get the witness to clarify what he meant by effectiveness of the H-90 flow. That is what they are measuring. He personally is involved in measuring and determining that. And I would like him to explain what that means.

THE COURT: The problem is there's an expert testimony objection. And this clearly goes right into

that area that *Torres* talked about where it could rely on hearsay evidence. So you can ask him how he defines effectiveness as far as I'm concerned, but not how -- there's some kind of group discussion with CWRM and DAR that reaches some kind of official conclusion about it. That would be an opinion. Okay?

MR. FRANKEL: And Your Honor, he already has testified in terms of all of this is based on coordinating with the Division of Aquatic Resources. So he's already established that that is where the information is coming from. It's not -- this is -- there is a real --

THE COURT: Mr. Frankel, we are never going to finish this trial if every time I make a ruling we have another conversation. I made a ruling. It was in your favor in fact. So just be quiet for a minute and wait for the next question.

MR. FRANKEL: Sorry.

THE COURT: Okay. Go ahead, Ms. Goldman.

BY MS. GOLDMAN:

Q And Dr. Strauch, you testified that you personally are involved in this study. What is your personal -- what is your individual role in this study?

A So I am coordinating the outcomes that the Water Commission would like to see. And that includes

things like the occupancy of the stream by particular species as determined by various methods and the reproductive potential of the species that we are of interest that will occupy or should occupy the stream based on the model. And --

Q May I -- may I ask you to please clarify. You said that you were coordinating or consulting. What does that mean? I want to know what your personal individual role is please.

A So I helped determine or my personal role is to lead the determination of the outcomes we want from the study.

Q How do you determine the outcome?

MR. FRANKEL: Objection, Your Honor. Calling for expert testimony.

THE COURT: She's asking for the process. How does he? She hasn't asked him what is it yet.

MR. FRANKEL: I --

THE COURT: Overruled. Go ahead and answer, Doctor.

THE WITNESS: So the outcomes that we want to determine are, does the stream provide sufficient habitat to support a particular density of native biota or the presence or absence of particular species, the reproductive potential of the biota that do occupy it.

We want to determine if the stream is a source for sink population, for example, as well as how recruitment is being effected by the recruitment to the stream by juveniles is being effected by the H-90 flow versus a fully restored flow. There are things like the amount of habitat that is available that we're trying to determine, the quality of the habitat. These are things that we want to be determined.

BY MS. GOLDMAN:

Q And --

MR. FRANKEL: Your Honor, move to strike wherever he says "we." The question I think was supposed to be on personal, and his answer is about what we are doing.

THE COURT: Objection overruled.

MS. GOLDMAN: Absolutely --

THE COURT: Overruled. Ask your next question.

MS. GOLDMAN: Thank you.

BY MS. GOLDMAN:

Q Why is that something -- in your -- as I understand it, why is that something you as a hydrologist are needed for? And what is your role in that?

A I evaluate the available data and draw conclusions that the Commission then makes for

management. So it is my job to evaluate whether past Commission decisions are meeting the goals of the management decision, and that includes things like improving habitat for native biota, protecting judicial and customary practices. All the things that are defined as instream values is my role to evaluate the effectiveness of the management decision.

Q And you said that you evaluate the available data. Can you describe this data, what you're talking about?

MR. FRANKEL: Objection. Expert testimony.

THE COURT: Well, if we ever get there, I might agree with you. But I'm asking you to rephrase. That's just a very general question, Ms. Goldman. And we're in this situation -- we're all aware we're kind of walking in a minefield right now. It's going to help a lot if you ask targeted questions instead of general ones. So thank you.

BY MS. GOLDMAN:

Q Okay. So you just testified that you evaluate the available data. What form does that data take?

A It can be things like biological studies, hydrological studies, onsite testimony from key informants. It takes the form of quantitative and qualitative data.

Q What -- please elaborate on what -- how you evaluate that.

MR. FRANKEL: Objection. Form of the question.

THE COURT: Too vague. Rephrase. I don't even know what you mean by that.

BY MS. GOLDMAN:

Q Okay. Dr. Strauch.

THE COURT: Go ahead. Sorry.

MS. GOLDMAN: That's okay.

BY MS. GOLDMAN:

Q Dr. Strauch, you testified that you evaluate the available data. What's evaluate in that sentence? What do you mean?

MR. FRANKEL: Objection. Same objections, Your Honor.

THE COURT: Overruled. Again, right now she's just asking him about a process. It's not -- Doctor, she's not asking you to give any opinions at this point, so please do not offer those. Thank you. Go ahead.

THE WITNESS: So in some ways or depending on the location or the management decision, I will do a field site inspection. I will gather data in the field. I will take measurements. I will do a survey. In other situations, I will interview people on the ground. I

will meet with the community.

Is that sufficient to answer?

BY MS. GOLDMAN:

Q Yes. Thank you, Dr. Strauch. So you take measurements. What are you measuring?

A It depends on the data. So sometimes I'm measuring the width of the stream, the depths of water, the velocity through it, the substrate in it, the occupancy of a particular species, the temperature or water quality parameters.

Q And what is your personal understanding of why you are collecting that data?

A Because --

Q I'm sorry. I'll withdraw that. What is your personal understanding of what that data measures?

A That data tells us what is happening in the stream.

Q Please tell us.

A Right. The -- lack of better analogy, it's the boots on the ground. There is only so much you can gather from historic records, but we try and conduct as much field work as possible. I personally lead the majority of the field work that gather these types of data that relate to instream values. And that data then gets communicated within the Commission and to the

Commission.

Q What forms does that field work take?

A I don't know what you mean by forms.

Q You said that you personally lead the field work. Can you give us an example of -- of --

A Much of the time I am the one doing the actual data collection, doing the field work, whether it is getting in the stream or meeting with people, stakeholders, that sort of thing. Occasionally or in the past we have -- the Water Commission has collaborated with other entities and Water Commission staff, including myself, conduct site visits to gather data.

Prior to my employment with the Water Commission, I would -- more academic studies of these streams in which we gathered habitat, data, hydrological data, that sort of thing. Biological data.

Q Thank you, Dr. Strauch. I'm not going to wade into that minefield quite yet. Can you describe for us a site visit for this purpose? Just describe a site visit for this purpose.

A It can be as simple as getting out of a car, walking down or hiking to the stream, using equipment in the stream, snorkel surveying in the stream, taking measurements at the stream. It might be more cumbersome if the access is not so straightforward. It might

involve much lengthy hiking and collaboration for access.

Q Okay.

A Worst case scenario involves a helicopter and a lot more in terms of emergency preparedness. The -- some of these sites are extremely remote and dangerous to get to. So the -- what we do there is dependent on the question we're trying to answer and the data that we're trying to collect.

Q And how is the data that you are trying to collect stored?

A We have various state servers. We publish data on our website. We are working on a geoportal. I think I alluded to that. Some of the data gets -- so there's a biological database that the Division of Aquatic Resources maintains that we submit data to.

Q Do you submit data to it personally?

A Yes. Sorry.

Q Please phrase the rest of your answers in those terms.

A I submit the data. I publish the data through peer review journals. We -- I produce what we call fact sheets, which are summaries of information. I communicate data to the Commission.

Q How do you -- how do you summarize this information?

A Using statistics. Do you want me to elaborate?

Q Yes.

A I mean, I can teach a course in Statistics if you want.

Q Not a course in Statistics. Thank you, Dr. Strauch. I'm just trying to get a sense of what exactly this entails. Your --

A Some of the data require a QA/QC, quality control, quality assurance. Some of the data require more elaborate statistical processing. We -- I looked at body condition health of a species, for example. And body condition requires various dimensional measurements of the animal, of the organism. And those actually have to be converted based on our structure of the animal to a biomass, a wet weight biomass. So that is a process that happens within a spreadsheet.

The density of an individual in a point survey can be converted to a stream density based on the area of known habitat that we -- that I measure while at the site and then can be or is modelled based on the hydrological data available.

Q Okay. Dr. Strauch, you said that you measure the area of known habitat when you are at the site. How do you do that?

MR. FRANKEL: Objection, Your Honor. We're getting expert testimony.

THE COURT: She's just asking him how he measures, so --

MR. FRANKEL: I --

THE COURT: I don't think that calls for expert testimony.

MR. FRANKEL: Well, you'll see what's about to happen.

THE COURT: I have a pretty good idea what's going to happen, but there's nothing I can do about that right now.

Go ahead and answer.

THE WITNESS: So for a particular reach, I will measure the width of the reach at multiple locations, the depth of flow across that width at multiple locations, the velocity of flow across that width at multiple locations, and the substrate, the proportion of substrate occupied in that width at multiple locations.

BY MS. GOLDMAN:

Q Okay. And how does that tell you the area of known habitat, which is what you just testified that you are measuring?

MR. FRANKEL: Objection. That's calling for

expert opinion.

THE COURT: Sustained.

BY MS. GOLDMAN:

Q Have you personally ever done a survey of aquatic biota in the East Maui watershed?

A Yes.

Q Have you personally done that since you have been employed with CWRM?

A Yes. So I --

Q Please tell us about --

A -- surveyed a number of East Maui streams in 2017 as a follow-up to prior surveys. And I quantified the number of individual species in known transects and they then quantified the amount of habitat for those species in those same transects or in those same reaches.

Q How do you -- you said you quantified the amount of habitat?

A Yes.

Q How do you quantify that?

MR. FRANKEL: Objection, Your Honor. Expert testimony and/or irrelevant.

THE COURT: I mean, this is just so general, Ms. Goldman. I mean, I don't even know if we're talking about -- I assume we're talking about East Maui, but I have no idea from the question. Sustained.

BY MS. GOLDMAN:

Q Okay. Mr. Strauch, you just testified that you quantify habitat; correct?

A Yes.

Q What unit do you measure it in?

MR. FRANKEL: Objection, Your Honor. This is -- this really is expert testimony.

THE COURT: Okay. We're -- the objection is sustained.

We've been going quite a while, so we're going to take our last -- maybe not our last, but we're going to take our next break. It's a couple minutes before 3:00. We're going to break until 3:10. And I'm going to ask counsel, Ms. Goldman, Mr. Wynhoff, to give some real thought to where this is going. 'Cause if he's not going to be allowed to give the ultimate opinions, I'm really not sure why we're spending so much time building a foundation to give the opinion.

MS. GOLDMAN: Your Honor, if I may --

THE COURT: You may.

MS. GOLDMAN: -- it will become very clear to you why this is relevant and going somewhere.

THE COURT: Okay. I'm being patient.

Mr. Frankel, go ahead.

MR. FRANKEL: I would like to request that you

instruct counsel, I'm sorry, not to be talking to the witness at all in this break. I'm sorry.

MS. GOLDMAN: I just offered that.

THE COURT: I am going to rely on counsel's professionalism. If you decide you want to dig into that with the witness, you can.

One thing. Mr. Frankel, I wanted to apologize to you for saying be quiet. That was not -- that was intemperate of me. I should have just said, you know, wait for the next question. So I apologize. And I won't do that again.

Okay. We're in recess till 3:10. Thank you.

(A recess was taken.)

THE COURT: All right. Back on record. FTR on?

THE CLERK: Yes, it is, Judge.

THE COURT: All right. Ms. Goldman.

BY MS. GOLDMAN:

Q Dr. Strauch, did you testify before the BLNR or Board of Land and Natural Resources at its meeting on November 9, 2018?

A I did.

Q What was the nature of that testimony?

A The Board asked me to provide information about the 2018 Commission decision and order regarding

the East Maui streams.

Q Did you offer an opinion to the Board at any time during that testimony?

A I would have to refer to my testimony. I don't --

Q That's okay. Okay. So would it refresh your recollection if you could have a chance to look at it briefly?

MR. FRANKEL: Objection, Your Honor. The testimony is already in evidence with the transcript.

THE COURT: Yeah. Well, if we already have the transcript, why do we want his recollection of what it was? I mean, no offense, Dr. Strauch. It's just an evidentiary thing. Nothing personal.

MS. GOLDMAN: Your Honor, this witness testified that the 27 streams in the licensed area were the most important. I would like to explain that he told the Board that.

For the record, it does not matter whether or not -- I'm not offering any of this for the truth of the statement. I am offering this for what the Board was on notice of, just on the listener. So it is not going to come within hearsay.

THE COURT: That will be established by the transcript. Objection is sustained.

BY MS. GOLDMAN:

Q Okay. During the -- that meeting, do you remember if -- do you -- were you asked about the streams for which new IIFS was not set in 2018?

MR. FRANKEL: Objection. Cumulative. The transcript's in the record.

THE COURT: Sustained. Ms. Goldman, just to save time, if you're going to ask him about anything in the transcript, I'm going to sustain the objection. If he said something to the Board that's not in the transcript, then we can have a separate discussion about that. But --

MS. GOLDMAN: Your Honor, I would like to ask the witness what he meant by a specific statement that he said that is in the transcript. I'm unsure of how to bring that into this conversation without either refreshing the witness's recollection as to what he said or reading a line that's already in evidence.

THE COURT: What's the relevance of what he meant? Doesn't it matter what he said to the Board?

MS. GOLDMAN: Your Honor, I don't believe so. I believe this entire case is premised on the idea that the Board somehow did not collect enough information or ask enough questions. I think it is entirely relevant to show what kinds of opinions were conveyed to the Board

and to demonstrate why the Board may have found them to be credible.

THE COURT: Mr. Frankel?

MR. FRANKEL: The fact the information was conveyed to the Board is already in evidence. The reason why it was conveyed is not relevant to this case. It's the Board's decision, and that is reflected in the minutes and in the transcript. So objection.

THE COURT: Objection is sustained, Ms. Goldman. If you're asking him to testify about what he meant, I'm finding -- I find that that's interesting but irrelevant. What matters is what the Board heard and what the Board did. The objection is sustained.

MS. GOLDMAN: Respectfully, Your Honor, may I have just a moment to confer with my co counsel?

THE COURT: Yes, you may. That's fine. We're off record.

(A recess was taken.)

THE COURT: Back on record. FTR on?

THE CLERK: Yes.

THE COURT: Thank you. Ms. Goldman, go ahead.

BY MS. GOLDMAN:

Q Dr. Strauch, did you personally make a determination regarding whether the 13 streams we've spoken about today as the 13 streams are important?

MR. FRANKEL: Objection, Your Honor. Calling for expert opinion.

MS. GOLDMAN: I'm asking within the witness's personal capacity. What did he do.

THE COURT: Well, the question is, are they important. I don't understand what you mean by that, so you're going to need to rephrase.

MS. GOLDMAN: The question was whether --

THE COURT: All streams are important. I think everybody in this room would agree on that. So -- I'm not sure that's what you were trying to get. Some streams are more important than others, but they're all important.

BY MS. GOLDMAN:

Q Did you make a determination as to the relative importance of these 13 streams personally? Do you personally --

MR. FRANKEL: Objection. It's calling for expert opinion. I suppose it was just a yes-or-no answer. But beyond that, it's an expert opinion.

THE COURT: I'm going to allow it, but I'm not sure how much farther it's going to go. You may answer yes or no.

THE WITNESS: Yes.

BY MS. GOLDMAN:

Q What work did you personally do to make that determination?

A In my capacity as the Instream Use Protection Section chief or head, I determine the prioritization of determining interim instream flow standards for the State of Hawaii. And that prioritization is based on other literature such as the Hawaii Stream Assessment that determines candidate streams for protection. So we prior -- I prioritize for the Commission the next stream that I want to -- that I will establish an interim instream flow standard for based on the relevant data.

THE COURT: She was muted.

BY MS. GOLDMAN:

Q Did you tell that information to the Board?

MR. FRANKEL: Objection. Cumulative. Transcript's in.

THE COURT: If you're talking about the Board meeting, sustained. And when I say the Board meeting, I mean the one that we already have the transcript for.

MS. GOLDMAN: Sure.

BY MS. GOLDMAN:

Q Okay. I would to call your attention to an exhibit that has already been entered into evidence. That would be Trial Exhibit 58.

THE COURT: Is that Plaintiff's 5-8?

MS. GOLDMAN: Yes, Your Honor.

THE COURT: Thank you.

MR. FRANKEL: I'm sorry. Sierra Club's Exhibit 58?

MS. GOLDMAN: Yes.

THE COURT: I've got it. Dr. Strauch, do you have it there?

THE WITNESS: Is it a photo?

THE COURT: Yes.

THE WITNESS: Okay. Yeah.

BY MS. GOLDMAN:

Q Okay.

A 58. Hoolawa nui.

THE COURT: Yes.

BY MS. GOLDMAN:

Q What is this a photo of, or do you recognize the photo, Dr. Strauch?

A Yes. It is a photo of a ditch with a pipe coming into a stilling well on the left-hand side.

Q Okay. It was testified in this case that this is a photograph of Hoolawa Stream. Is that correct to your knowledge?

A No.

MR. FRANKEL: Objection in terms of reciting prior testimony to this witness.

THE COURT: Yeah. That's usually not how we like to do things, but I know you're just trying to transition him to it. We have his answer no.

BY MS. GOLDMAN:

Q How can you tell that this is a ditch?

A Because it has -- it's a -- well, it's not Hoolawa Stream because Hoolawa Stream is a wide -- has much wider widths and the banks are not shaped in this way. And this is a stilling well on the left-hand side of the photo, which would not have been built into a stream in this manner. This is not a stream stilling well. This is a ditch stilling well.

Q What about this photograph tells you that it's a stilling well?

A It is a concrete cylinder approximately 5 feet tall, maybe 6 feet tall. There is a wooden -- the base of a wooden box, which would have housed the monitoring equipment for the gaging station. And then the pipe enters the stilling well at the base, which provides for the water.

Q Thank you. Let's talk now about Trial Exhibit 54. That's Plaintiff's Exhibit 54, which is also a photograph that was entered into evidence.

A Okay. It's another --

Q Do you recognize what is depicted in this

photograph?

A This is the Waialoa ditch intake on Hoolawa nui.

Q How do you know?

A Because I've been there many times.

Q Which direction are we looking?

A Up stream. Do you need the cardinal direction? Okay.

Q Which direction is the water flowing in the photo?

A From -- it's kind of making an S shape. But if you trace it up from the grate, it moves slightly up and then to the right and then to the left. So it's -- if you start at the top left of the photograph and you go across at like a 30 degree angle to about the halfway point, and then you zag back to the center -- I don't know how to best describe this visually, but it's making like an S shape.

Q Okay. Is this -- in your experience, is this what this diversion at the Waialoa Ditch on Hoolawa nui looks like usually?

A When you say usually, during low flow or base flow conditions, yes.

Q Does it always look like this?

A No. During high flow conditions, water will

overflow as well as the wing walls that you see -- the concrete walls that you see. The water will flow down to the left or from left to right and over the intake.

You don't see it from this photograph, but in the bottom right-hand corner would be kind of a 120-foot drop.

Q Okay. Let's -- actually before we turn to the next photo, regarding the appearance of the water in this photo, is this typically what the water looks like at this diversion on this stream?

A Each of the times I've visited the stream, the water's appeared turbid or cloudy, which is a condition of this stream. Yes, this is typical.

Q To your knowledge as the individual charged with monitoring and maintaining diversions, is this stream diverted farther mauka of here within that -- (inaudible) -- area. I will clarify.

A I will clarify that I don't -- I'm not charged with maintaining the diversion but with documenting it. There are no other East Maui Irrigation diversions within the licensed area mauka of this one.

Q Okay. Well, let's turn to Trial Exhibit 55 please. Plaintiff's 55.

A Okay.

Q Okay. Do you recognize this photo?

A This is almost the same location, just a different direction of the photo from the previous -- from 54.

Q Can you explain where we're looking in relation to that previous photo?

A We're looking makai. Do you want the cardinal direction?

Q No. Thank you. Makai is fine. What -- what is -- what is this structure made of? What is this structure, what we're looking at?

A We're looking at a control gate, wrought iron, I think, that is used to lift up and release water and sluice material that gets caught in the diversion.

Q And is this -- is the pool of water that's below -- is that also Hoolawa nui Stream?

A Yes.

Q Is this a waterfall or -- it looks like a different elevation. Can you just explain?

A Like I said earlier, we -- the photograph is taken at the top of about a 100-foot waterfall. We are now looking down the stream over the lip of the waterfall. So the pool -- the plunge flow at the base of the waterfall, yes, is at a different elevation.

Q Is this waterfall -- to your knowledge, is this waterfall naturally occurring or is it something

that this diversion structure created?

MR. FRANKEL: Objection. Calls for speculation, expert opinion.

THE COURT: I think if you can answer based on your own personal observations and knowledge, you can answer. But if you have to rely on some textbook or study that you've read from somewhere else, then no. Thank you. Go ahead.

THE WITNESS: So the -- I know that the Waialoa Ditch was dug at a specific elevation above -- in most cases above the -- it's called the knickpoint in the stream channel where the watershed is being eroded. And this knickpoint is developed by the geology or is a factor of the geology. So this would have been a naturally occurring waterfall that the ditch diversion was built into.

BY MS. GOLDMAN:

Q And from your own observations, this naturally occurring waterfall, can you describe it more? Like the size and that sort of thing?

A It's about -- I would say about 100 feet tall. It's made of basalt, like the bedrock. It's -- the width of the stream at the top where the water is flowing would be flowing over it if the diversion was not there. It's about 6 to 10 feet wide. The plunge flow itself is about

120 feet wide, give or take.

Is that a sufficient description?

Q Yes, Dr. Strauch. Thank you.

Do you see an overhanging lip in this photo?

A No. You can't determine that from this photo.

Q Have you observed an overhanging lip in person?

A Yes.

Q What's an overhanging lip?

A So a lot of the stream courses in young lava flows in East Maui and on the Big Island, but in East Maui in particular, which is a little bit older in geologic age -- the stream courses have eroded through former lava tubes, areas that are more easily eroded.

And in the development of the stream channel at places like where you see a plunge pool form is from the underlying geology that the lava tube in its formation is obviously different from the formation of the stream channel. And the lava tube conveyed lava and -- or magma and in that development, it created in some instances what are called overhanging lips. So it's basically basalt that has hardened, and as the stream channel is formed through these string courses, the overhang lip remains.

MR. FRANKEL: Move to strike, Your Honor.

Nonresponsive and expert opinion.

THE COURT: Overruled.

BY MS. GOLDMAN:

Q Looking down -- oh, are we looking makai in this photo?

THE COURT: Yes. He already testified to that.

MS. GOLDMAN: Thank you.

BY MS. GOLDMAN:

Q What stands out to you in this photo?

A Two things. The substrate is primarily sharp basalt and boulder. And by sharp, I mean rough edges and jagged, not smooth.

And then second is that the riparian vegetation is dominated by nonnative species, primarily strawberry guava.

Q I would have said it looks dry like looking makai. Does it look that way to you?

A The stream bank or the stream channel? The stream channel is -- up to the plunge pool is full of water. And then downstream of the plunge pool, the stream channel looks dry.

Q To your knowledge, does this stream channel have any other diversions on it?

A It does.

Q Makai?

A It does at three more locations. No. Four more locations. Sorry.

Q In your experience out in the field, would you expect that this stream channel would be dry at all of those makai diversions up here under these conditions?

MR. FRANKEL: Objection. Speculation.

THE COURT: You mean under the conditions we're seeing in this photograph with this stream? Would he expect the three or four diversions downstream to all be dry? Is that the question?

MS. GOLDMAN: (Ms. Goldman nodded.)

THE COURT: All right. You can answer that, if you know.

THE WITNESS: So I have been there during such conditions, during very low flows. And the stream channel is a gaining stream. So there is water diverted at lower elevations within the stream channel. So there's flow that is diverted.

BY MS. GOLDMAN:

Q You noted a few moments ago that the water appeared cloudy. What does that mean to you?

MR. FRANKEL: Objection. Irrelevant, vague.

THE COURT: Well, he's a hydrologist. I'm going to allow it. Overruled.

THE WITNESS: So cloudy water, meaning high turbidity, impacts the quality of the habitat. So cloudy water prevents the growth of algae, which is a primary food source.

BY MS. GOLDMAN:

Q Thank you. I just wanted to stop you there and make sure that you're telling us what you -- what your understanding is of why you think cloudiness is significant in some way.

A So I've spent a lot of time studying water quality. And I have seen that cloudy water prohibits the growth of algae, which is the primary food source in aquatic ecosystems.

Q Let's turn to Trial Exhibit 56 please, if you will. It was also received into evidence in this trial. Do you have it up, Dr. Strauch?

A Yes.

Q Do you recognize this photo?

A Yes.

Q How do you recognize it?

A I've been to that location and seen that pipe.

Q And where is this location?

A It's on Hoolawa nui above the Waialoa Ditch intake.

Q And what is this pipe?

A It's a pipe that conveys spring flow slightly upslope from the stream channel down to the stream channel so that it may be diverted at the Waialoa Ditch intake.

Q To your knowledge, is this pipe related to one of A&B or EMI's diversions of this stream?

A Yes. As part of the system to divert water, there are many minor diversions or small-seep-type diversions which contributed to the overall amount of water that could be diverted.

Q In your opinion, Dr. Strauch, is this pipe garbage?

MR. FRANKEL: Objection, Your Honor.

THE COURT: I think what she -- I think what Ms. Goldman is really asking is, is this still functional.

MR. FRANKEL: That would be a better question.

MS. GOLDMAN: I would withdraw that question. And would you please answer the judge's question, Dr. Strauch?

THE WITNESS: If it is still connected to the spring and if water is flowing through it, then it is still operating as a diversion.

BY MS. GOLDMAN:

Q To your knowledge, are those things true?

A Yes.

THE COURT: There might have been some confusion there, Doctor. I believe what Ms. Goldman was asking was do you know if this pipe is still working.

THE WITNESS: I -- last time I visited this pipe, there was still water flowing in it, which was two weeks ago or so.

THE COURT: Okay.

BY MS. GOLDMAN:

Q Let's look at Trial Exhibit 59 please, Dr. Strauch. Let me know when you have it up.

A Okay.

Q Mr. Strauch, have you seen this photograph before?

A I have.

Q Dr. Strauch.

A Yes.

Q When or how have you seen it?

A I -- I have been to this part of the stream.

Q Have I also showed you this photo?

A Yes. That too.

Q And when I showed you this photo, are you able to tell where this photo is taken?

A From only the information in the photo? No.

Q And from a hydrologist's point of view, from

your personal point of view, does this photo appear to contain trash?

A So I can't see the entirety of the setting, so it would be difficult to determine if these items are connected to anything else, if they are a part of a structure. From just what's in this photograph, no.

Q Can you turn the page -- or, I'm sorry. The next exhibit please, Dr. Strauch. Trial Exhibit 60. What do you notice about this photo?

A There is water and either a pool or a run of -- appears to be a stream. Appears to be a bank of a stream. This is a strawberry guava root and a piece of wrought iron through it or on it, some sort.

Q Are you able to tell from this photo alone whether this is trash?

A It's hard to determine because you can't tell the entirety of the setting. So -- no.

Q Do you have -- when you visit various diversion structures along a stream, how do you get from one diversion structure to another?

A Either hiking or driving or helicopter.

Q In those instances when you are hiking, do you hike along trails?

A Sometimes.

Q Would you say that you have hiked probably --

how many trails in that East Maui watershed would you say you hiked on?

A So some of the trails are not official trails, they're not part of the Na Ala Hele trail system. Some of 'em are pig hunting trails. Some of 'em we build ourselves. So I'm not sure how to quantify the number of trails.

Q Okay. Have you hiked alongside of Hoolawa Stream?

A Yes.

Q How many times have you hiked there?

A I mean, maybe six or eight times.

Q On those hikes, have you observed trash on the trails?

A On the trails? No.

Q What's a terminal waterfall?

A It's the point of which a stream channel discharges into the ocean over a waterfall. So the terminal point of a stream that ends at a waterfall.

Q Of the 13 streams that did not have IIFS -- new IIFS specs for them in 2018, do any of them have terminal waterfalls?

A Yes. Kolea has a terminal waterfall, Nailiilihaele has a terminal waterfall, Kailua has a terminal waterfall, and Waipio has a terminal waterfall.

THE COURT: What was the second one?

THE WITNESS: Nailiilihaele.

THE COURT: Spell please.

THE WITNESS: N-a-i-l-i-i-l-i-i-l-i-i-h-a-l-e -- I believe it was previously spelled correctly. I'm not sure if I spelled it correctly. Sorry.

THE COURT: That's a good out.

BY MS. GOLDMAN:

Q Okay. So how do you know -- so let's go through them then. You said Kolea and Nailiilihaele. What was the third?

A Kailua.

Q And what was the fourth?

A Waipio.

Q Okay. How do you know that Kolea has a terminal waterfall?

A Because it was based on the topographic map, based on recognizance or field work as it conducted previously, and based on our waterfall's database.

Q Have you seen it?

A No, I have not seen the terminal waterfall on Kolea.

Q What about Nailiilihaele? How do you know there's a terminal waterfall there?

A Based on the previous information that I

cited.

Q What other -- is the presence of a terminal waterfall -- does that mean something to you?

MR. FRANKEL: Objection. Vague. Looking for expert opinion.

THE COURT: Sustained.

MS. GOLDMAN: Your Honor, how long -- how much longer should I be planning that we're going today?

THE COURT: If you're wondering if this would be a good time to end, the answer would be yes.

MS. GOLDMAN: Okay.

THE COURT: It's 4 o'clock. All right. So let's do some planning with Dr. Strauch about next week. 'Cause we still have Chair Case to come back. We're obviously not pau with Dr. Strauch. We may or may not be done with Mr. Higashi. Is there anyone else? Is Mr. Gon going to testify? 'Cause his name was mentioned before, but I haven't heard it lately.

Yes, Mr. Wynhoff?

MR. WYNHOFF: So Your Honor, let me start off with some good news and then we'll go to what may or may not be the bad news. We're not going to call Mr. Gon.

THE COURT: Okay.

MR. WYNHOFF: We are not going to call Mr. Higashi to come back. Mr. Schulmeister has very

STATE OF HAWAII)
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CITY AND COUNTY OF HONOLULU)
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_____)

I, JAMIE S. MIYASATO, an Official Court Reporter for the First Circuit Court, State of Hawaii, do hereby certify that the foregoing comprises a full, true, and correct transcription of my stenographic notes taken in the above-entitled matter, so transcribed by me to the best of my ability.

Dated this 14th day of August 2020.

/s/ Jamie S. Miyasato

_____

JAMIE S. MIYASATO, CSR #394

sierra club/081420

IN THE CIRCUIT COURT OF THE FIRST CIRCUIT

STATE OF HAWAI'I

SIERRA CLUB, Plaintiff, vs. BOARD OF LAND AND NATURAL RESOURCES, DEPARTMENT OF LAND AND NATURAL RESOURCES, SUZANNE CASE in her official capacity as Chairperson of the Board Land and Natural Resources, ALEXANDER AND BALDWIN, INC., EAST MAUI IRRIGATION COMPANY, LLC and COUNTY OF MAUI, Defendants.	Case No. 1CC191000019

TRANSCRIPT OF WEBEX PROCEEDINGS had before the Honorable Jeffrey Crabtree, Judge Presiding, on Monday, August 17, 2020, for Further Jury-Waived Trial - Morning Session Only.

REPORTED BY:
A. HAUNANI HO, RPR, CSR 372
OFFICIAL COURT REPORTER
FIRST CIRCUIT COURT
STATE OF HAWAI'I

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RESOURCES, DEPARTMENT OF
LAND AND NATURAL RESOURCES

I N D E X

E X H I B I T S

that the plan?

I see head-nodding from Ms. Goldman.

MS. GOLDMAN: Yes, Your Honor.

THE COURT: Okay. Everybody ready to go?

All right. Thank you.

Mr. Strauch, welcome back. Good morning.

THE WITNESS: Good morning, Your Honor.

THE COURT: All right. I'll remind you that you're still under oath. We don't need to swear you in again. And please continue doing what you were doing last week in terms of speaking directly and clearly and spelling the more complicated Hawaiian names as we go along. Thank you very much.

Ms. Goldman.

AYRON STRAUCH,

called as a witness by the State,

having been previously sworn was

examined and testified as follows:

DIRECT EXAMINATION (Resumed)

BY MS. GOLDMAN:

Q Dr. Strauch, how many streams would you estimate are in the State of Hawai'i?

A We have 376 perennial named streams that are flowing to the ocean. That doesn't include all of their respective tributaries whether they are named or

not named.

Q And how many of those 376 perennial streams are still subject to their status quo IIFS from the 1980s?

A About 320 of them, 324, something like that.

Q And has anyone -- have there been petitions filed with respect to those approximately 320 streams?

A We have one pending petition relating to streams on the island of Moloka'i and the current petition alleging waste and instre -- you know, mismanagement of instream flow standards in West Maui. But we've addressed some of the issues in that petition already, but that's a separate issue.

Q Okay. I call your attention to last week when we previously spoke and we talked about your -- we talked about your personal experience at each of the streams. I just wanted to clarify a few things about that.

With respect to Honopou Stream, H-O-N-O-P-O-U, had you visited there before November 2018?

A Yes.

Q How about Ho'olawa? Have you visited Ho'olawa, H-O-O-L-A-W-A, before November 2018?

A Yes.

Q And I'd like to ask you a few more questions about Mokupapa. You previously testified that you had never visited there. Are you otherwise familiar with Mokupapa Stream?

A I'm familiar in the sense that I have looked at the registration files for the stream diversions on Mokupapa and I've studied the watershed and the data that are available for Mokupapa.

Q And were those studies -- withdraw that.

When that experience with Mokupapa, did that begin before November of 2018?

A Yes. The Commission has looked at setting instream flow standards, other important areas across the State, you know, as part of our prioritization process.

Q And was Mokupapa prioritized?

MR. FRANKEL: Objection, --

THE WITNESS: No.

MR. FRANKEL: -- Your Honor. And I think I need to explain myself without the witness present.

THE COURT: All right. Mr. Strauch, Dr. Strauch, can you step outside briefly. Thank you very much.

THE WITNESS: Sorry.

Dr. Strauch is to elicit from him his personal observations and to clarify the bases for those observations due to a potential objection that was flagged by Mr. Frankel last week.

THE COURT: All right. Objection overruled. We'll see where this goes. Go ahead. Please continue, Miss Goldman.

MS. GOLDMAN: Mr. Wynhoff has stepped out to let the witness back in.

THE COURT: Thank you.

MR. WYNHOFF: I'm back.

THE COURT: Okay. Thank you. Please proceed.

MS. GOLDMAN: Okay.

Q Ayron, to your -- to your knowledge, Dr. Strauch, I apologize, what is the maximum elevation of Mokupapa?

A It is a -- give or take a few hundred feet, about 1550 feet in elevation.

Q Would you characterize it as a large stream?

A No.

MR. FRANKEL: Objection, Your Honor.

THE COURT: Basis? Just briefly not a long --

MR. FRANKEL: Expert, vague.

THE COURT: Overruled. Go ahead and answer.

THE WITNESS: No. Mokupapa doesn't have a large watershed area and it doesn't receive as much rainfall and the watershed does not extend into the zone of fog drip which contributes substantially to recharge. And all of these would contribute to greater stream flow. Because Mokupapa does not meet those criteria, it does not have much stream flow.

I have also seen photos of the flow in the stream and the size of the stream channel and they confirm that Mokupapa does not have much stream flow relative to other streams in East Maui.

Q (BY MS. GOLDMAN) What's the -- just very briefly, what's your understanding of the fog drip zone? You used that term, just to clarify.

A So the zone of fog drip occurs between 2,000 and 6,000 feet in elevation on windward mountains here in Hawai'i. It's based on what we call the temperature inversion. It's the zone in the toposphere that -- where a temperature increases as you go up in elevation as opposed to typical conditions where temperature gets colder as you go up in elevation. This temperature in the inversion zone keeps the warm moist air that comes off of the ocean to a band of elevation between 2,000 and 6,000 feet. And that band of warm moist air contributes to fog drip. Fog drip,

again, contributes upwards of 30 percent of the recharge in the watershed.

Q What do you mean by recharge of the watershed?

A The amount of water that is input to the hydrologic units. So if you think of the watershed as a bucket, and you get rainfall that falls into the bucket, and you might have a hole in the bucket, which might represent the stream discharging water, you would also get mist. Or if you were to spray a mist bottle on the sides of the bucket, that mist would condense and collect on the bucket and flow into that pool of water that's available for ground water or stream flow.

Q Okay. All right. With respect to Waipi'o Stream, W-A-I-P-I-O, you testified that the last time you were there was in July. Had you been prior to July?

A No, I had not.

Q Okay. And describe the -- describe what based on your own observations were -- I withdraw that.

You also testified that you had been four times in total. Can you approximate when those four times would have been?

A So between July and August I was in East

Maui about four times.

Q Okay. Of this year?

A Yeah.

Q Okay. And based on what you observed, regarding the conditions of Waipi'o Stream, how would you characterize the flow?

A It's very flashy in the higher elevations -- I'll qualify flashy, meaning it responds to runoff. In the higher elevations the watershed's very narrow and therefore whenever it rains a substantial amount you get a lot of runoff. But there is -- there are no substantial tributaries so it doesn't have a lot of base flow.

Downstream or makai of the New Hāmākua Ditch diversion there is a large waterfall. This waterfall is dry unless you have a freshet event. Between the waterfall and the Lowrie Ditch, there are ground water gains in flow and -- but, again, no substantial tributaries.

Q Okay. How about Hanehoi Stream, H-A-N-E-H-O-I? Had you been there before November 2018?

A Yes.

Q How about Hoalua Stream, H-O-A-L-U-A?

A Yes.

Q Had you been there?

Okay. Had your -- had you been to Hoalua Stream before November 2018 in your capacity at this current job?

A Yes.

Q And describe -- just based on your observations, describe Hoalua for us please.

A Hoalua is a watershed that stems higher into the mountain hi -- to a higher elevation than say Waipi'o. It has two -- it has one small tributary and one main stem above the Wailoa and New Hāmākua Ditches. It is heavily incised into the basalt through the main middle reach between the New Hāmākua Ditch and the Lowrie Ditch.

There is a major control structure on the westward side of the intake on the Lowrie Ditch such that no water -- or such that the amount of water diverted at the Lowrie Ditch could be regulated.

The substrate in Hoalua in the lower elevations is -- we call like jagged basalt. So it's relatively freshly broken up boulders basically. Hoalua has low reach diversity. Most of the watershed is composed -- most of the lower elevations of the watershed at least are composed of non-native species. Um --

Q You used the term middle reach. I don't know if we've previously discussed what's meant by lower, middle, and upper reach. Could you take a moment please and explain that?

A Okay. So the stream channel is broken into various sections depending on the distance inland and the elevation of the channel, and these sections support different types of biota.

The lowest elevation reaches are more estuarine, brackish. They support a larger complement of native biota. The middle reaches support species such as 'o'opu, nākea, and 'o'opu nōpili. And then the upper and high elevation reaches support more of the better climbers such as 'ōpae kala'ole and 'o'opu alamo'o.

Q We --

THE COURT: You need to spell those please.

THE WITNESS: Oh, sorry. 'O'opu is O-O-P-U.

And then alamo'o is A-L-A-M-O-O.

'O'opu nōpili, N-O-P-I-L-I.

Nākea, N-A-K-E-A.

THE COURT: Thank you.

Q (BY MS. GOLDMAN) Thank you.

And you briefly touched on the four at Hoalua Stream. Could you just talk about that for another

moment?

A The lowest elevations are the lower approximate quarter or 25 percent of Hoalua, give or take, is zoned agriculture in the state land use district zoning. As such, there is greater low density housing. The land cover is heavily modified. There's the introduction of a lot of non-native species.

Species such a hau bush and bamboo are frequently found at these elevation -- or at this zone in both Hoalua and neighboring watersheds. And these all impact things like leaf litter input, the what we call occlusion of the stream channel or the covering of the stream channel. So when water's flowing underneath the canopy, that canopy can block the sunlight. And the sunlight is what drives algal production and algae is the basis for our food resource for our aquatic ecosystem. Um --

Q So --

A Yeah.

Q If I may just interrupt you for a moment. So things like occlusion of the stream channel, is that something that you can observe? Like you personally have observed that?

A Yes.

Q Okay. And have you personally observed

the lack of algal growth? In --

A Yes.

Q -- that -- okay. And the hau bush and bamboo?

A Yes.

Q How about, let's see, Hanawana Stream, H-A-N-A-W-A-N-A. You testified that you never visited there, but you did have knowledge of the diversion before -- well, I apologize. But you had knowledge of the diversion. Did you have knowledge, personal knowledge, of the diversion structure prior to November 2018?

MR. FRANKEL: Objection, relevance.

THE COURT: Overruled.

THE WITNESS: So my knowledge of the diversion structures on that stream are from the historic documents, the registration files that we keep.

Q (BY MS. GOLDMAN) Okay. Was there verification field work done on --

A Yes.

Q -- that stream?

A Um --

Q When was that?

A The Commission hired a consultant to verify stream diversions in East Maui. I think it was

in 2010, 2011. So we have their verification records as well and their photographs.

Q Have you had the opportunity to review those in addition to other historical documents?

MR. FRANKEL: Objection, calls for hearsay.

THE COURT: Hold on.

When you say review those, you're talking about these consultant documents from 2010 to 2011?

MS. GOLDMAN: Yes, Your Honor, but I don't intend to ask anything further regarding them, or their content.

THE COURT: So you're just asking if he reviewed them. You're not asking him to tell us what's in them. All right. You may answer.

MS. GOLDMAN: Yes, Your Honor.

MR. FRANKEL: Well, then, Your Honor, irrelevance.

THE COURT: You may answer.

THE WITNESS: Yes, I have reviewed all of the consultant's work.

Q (BY MS. GOLDMAN) And to your knowledge, are there diversions belonging to other parties who are not EMI, A&B on Hanawana Stream?

A Yes.

Q How about on Waipi'o Stream? Are there

non-EMI diversions there?

A Yes.

Q And how about Mokupapa? Are there non-EMI diversions there?

A Yes.

Q Moving on to Kailua Stream, K-A-I-L-U-A. You had testified that you've been there 120 times I think you said because it's easily accessed from the road. But have you also been there for work?

A Yes.

Q Okay. And had you been there for work prior to November 2018?

A Yes.

Q Okay. Describe Kailua Stream for us, please.

A Kailua Stream has one main tributary. It extends fairly high up in elevation. I think to around 6 or 7,000 feet in elevation. I could be off. The main tributary is named Ohanui, H -- or O-H-A-N-U-I, the spelling on some maps. Some documents refer to that stream as West Kailua.

The Kailua and West Kailua channels are heavily incised. They are fairly large or wide. They're also full of hau bush and other non-native vegetation. There are a number of inland waterfalls,

multiple inland waterfalls of substantial height, some of which have overhanging lips. There is a terminal waterfall.

Kailua Stream is -- has -- has three major diversions on it. It is a gaining stream. There are -- there's one -- no, there are two major diversions on West Kailua Stream.

I'll stop there.

Q Okay. So are there any -- you said that there's a terminal waterfall. Just to clarify, that's a waterfall ending in the ocean, correct?

A Correct.

Q And other waterfalls as well.

Are there other natural barriers -- other barriers to migration that you've observed? I mean, barriers to connectivity of that stream?

MR. FRANKEL: Objection, calling for expert opinion.

THE COURT: When you say that stream, are you talking about Kailua Stream?

MS. GOLDMAN: Yes, Your Honor.

THE COURT: So you're just asking him if there are any natural barriers to migration?

MS. GOLDMAN: Any other natural barriers to migration.

THE COURT: All right. The objection's overruled. You may answer.

THE WITNESS: The inland waterfalls represent natural barriers to migration, for certain species.

MS. GOLDMAN: Okay.

Q I assume that would be the non-climbers? Is that --

A The climbers that are not the best climbers.

Q Okay. Nā'ili'ilihaele Stream. N-A-I-L-I-I-L-I-H-E-L-E. And this one also you had said was easily accessed from the main road. Do you also visit it for work?

A Yes, I do.

Q Okay. And had you visited before November of 2018?

A Yes.

MR. FRANKEL: Relevance.

THE COURT: Overruled.

THE WITNESS: Yes.

Q (BY MS. GOLDMAN) Describe Nā'ili'ilihaele for us, please.

A It's a relatively large watershed, it extends again fairly high in elevation, through the fog drip zone. There are a couple of -- I would say three

relatively small tributaries that are -- contribute to the main stem.

The main stem is diverted five times. A portion of the main stem is used for the conveyance of water from the Center Ditch to the Lowrie Ditch. There is a offstream reservoir that is fed by water diverted from this main stem. The -- much of the watershed is modified by the presence of bamboo. Bamboo has invaded much of the middle elevations and has changed the riparian zone substantially as well as the stream.

Nā'ili -- the -- Nā'ili'ilihaele ends in a terminal waterfall. There are a number of inland waterfalls as well.

Q And how about on Nā'ili'ilihaele, what about any gaging stations? Are there any gaging stations?

A The Commission on Water Resource Management has up until last year had not funded any long-term continuous gaging stations. But we in consultation with USGS on our statewide monitoring needs assessment, we added a station in -- on the main stem above the Wailoa in -- Ditch intake. This station was previously active from 1913 to 1971 I believe, or '75.

In terms of its location as an index station

and the continuity of long-term monitoring records to understand climate impacts to hydrological resources, this location was ideal. We checked off a number of boxes in our monitoring needs assessment.

Outside of that station that was recently funded, no, there are no other gaging stations in Nā'ili'ilihaele.

Q Okay. And Puehu Stream, P-U-E-H-U. You said that you had been there four times not counting seeing it from the highway. Was that for work purposes?

A Yes.

Q And were those visits, were any of them before November of 2018?

A Uh -- no.

Q Okay. When were they?

A Um -- over the last year and a half.

Q Okay. And just briefly, and it -- assuring -- you know, ensuring that it's based on your personal observations only, could you please describe Puehu Stream for us?

A Puehu has two small tributaries. Pa Stream and Puehu Stream. Pa Stream has -- starts at about the 3,000 foot elevation, maybe 2200 feet in elevation. I can't remember off the top of my head.

Pa Stream is used for the conveyance of water at the Center Ditch very -- for a very short period -- short length.

And then Pa Stream is diverted by the -- sorry, that -- I -- instead of Center Ditch, I meant Manuel Luis Ditch, and then Pa Stream is diverted by the Center Ditch as well. Um --

Q How about --

A Pu --

Q -- the -- oh. I apologize.

A No. Puehu Stream is also diverted by the Center Ditch. Puehu hydrologic -- or watershed is relatively small. It's dominated by non-native vegetation. The -- there are no structures at the Center Ditch intakes. The small stream flows directly into the ditch.

Q Okay. How about 'O'opuola? O-O-P-U-O-L-A. You also said you'd been there about 119, 120 times. Was that also for work?

A Yep. So 'O'opuola Center Ditch intake can be accessed from the main highway. The -- there are -- there's one named tributary for Makanali -- or named Makanali into 'O'opuola. That's M-A-K-A-N-A-L-I. Makanali. 'O'opuola has three tributaries that are minor. The -- each one is diverted by the Wailoa and

New Hāmākua Ditches.

'O'opuola main diversion is on Wailoa Ditch and captures most of the base flow available. From the Wailoa Ditch makai, so from about 1250 feet to the ocean, 'O'opuola watershed's dominated by non-native vegetation, a lot of hau bush. There are areas that have some thick stands of strawberry guava.

I'll leave it at that.

Q Okay. Ka'aiea. K-A-A-I-E-A. You said you'd been there four times for work, last time being earlier this month. Had you also visited in November of 2018?

A Um --

Q Or I apologize. Had you also visited prior to November of 2018?

A Um -- no. Uh -- un -- unless you're just referring to seeing something from the highway. Ka'aiea is a relatively small stream, although it's got -- the watershed extends fairly high up in elevation. It doesn't have any major tributaries at all.

The main intake is on Wailoa Ditch at -- above a waterfall. There are a couple of inland waterfalls at the Man -- it's diverted at the Manuel Luis Ditch and then the Center Ditch as well. The Center Ditch

intake is right on the highway so you can see it from the highway. But because there's relatively little water that's flowing into it, it's less of a priority for us to, um -- observe.

Q Okay. How about Punalu'u, P-U-N-A-L-U -- L-U-U? Had you -- you testified that you've analyzed this stream in the course of your job. Had any of that taken place prior to November of 2018?

A So as part of my job, um -- we look at the larger sources of water that contribute to irrigation systems, and this stream does not contribute much flow. It's a relatively small watershed. It doesn't extend into that zone of fog drip. It's dominated by bamboo. It's, um -- low base flow.

Q Okay. Thank you.

Kōlea Stream, K-O-L-E-A. Had you visited before November of 2018?

A Yes.

Q And can you please describe Ke -- Kōlea Stream, including how you get there.

A Um -- you can get to part of the stream from the highway, but you can also drive. There are two different access roads to Kōlea.

The watershed is heavily dominated by bamboo. Bamboo was -- has been encroaching from the Waikamoi

side and it has been, um -- altering the vegetation cover. Kōlea also used to have an instream reservoir that was decommissioned by the State in 2011 and a con -- consultant removed the structure altogether.

There is a West Kōlea tributary to the East Kōlea or main Kōlea Stream. Kōlea extends kind of a -- not as high up and onto Haleakalā as say Kailua, but higher up than say Puehu, and therefore there's a little bit more water available for instream and offstream uses.

Kōlea, because the name was also part of -- because the name Kōlea was part of a tributary to Punalau, which was part of the original petition, we've spent -- I have spent a -- more time studying Kōlea and Division of Aquatic Resources did a number of biota surveys in Kōlea and I've studied those results.

Kōlea ends at a terminal waterfall and is a gaining stream.

Q Okay. Okay. How about Waikamoi? You said you had been about 120 times. Have you been there prior to November of 2018?

A Yes.

Q Was that for work?

A Yes.

Q Are there any gaging stations on

Waikamoi?

A The Water Commission manages and -- a gaging station to monitor instream flow standards, and that responsibility lies on me to -- to do the field work for and analyze the data. There is also a Maui County funded USG -- co-funded USGS gage above the Waikamoi dam at about the 4,200 foot elevation, give or take a few hundred feet. That's above the Waikamoi Flume which is a primary drinking supply for Upcountry Maui.

Q Okay. Puohokamoa, P-U-O-H-O-K-A-M-O-A. You said you'd been there approximately 40 times and that you'd been there before November 2018.
Was -- were those visits for work? Had you been there in the course of this job?

A Yes.

Q Okay. Haipua'ena, H-A-I-P-U-A-E-N-A. Actually, withdraw that one.

Punalau, P-U-N-A-L-A-U. You briefly touched on this, but just again had you visited before November 2018?

A Yes.

Q Honomanū, H-O-N-O-M-A-N-U. Is there a gaging station there?

A There is no -- well, right now, yes.

The -- in 2018 I -- the Commission on Water Resource Management added Honomanū as part of our statewide monitoring needs. I had tried to establish a monitoring station in Honomanū at a lower elevation, and the gaging station kept getting wiped out by flash -- flash flooding.

It was very frustrating, because you can spend a day and a half doing installation and you visit it five or six times to start developing the rating curve and site the station, and then a boulder the size of a bus moves and you have to start all over and you lose all your equipment. So this is one of the examples of a location where it is -- makes sense for us to fund a USGS gage because it saves time on my plate to address other issues.

Q And that USGS gage is there and active today, correct?

A They have a gaging station that is collecting data right now. They are not quite finished with the satellite connection, but they have been monitoring the dat -- the flows, yes.

Q Okay.

THE COURT: Miss --

Q (BY MS. GOLDMAN) Nua'ailua, have you --

THE COURT: Miss Goldman, we've been going 50

minutes so we're going to take our morning break. So I'll see you at two minutes of 10:00. Okay? Ten minutes from now.

MS. GOLDMAN: Okay. Thank you.

THE COURT: All right. Thank you.

All right. Off record.

(Off record.)

THE COURT: We're in recess.

(Recess taken at 9:50 a.m.)

(Proceedings resumed at 9:59 a.m.)

THE COURT: All right. We're back on record.

FTR on?

THE BAILIFF: Yes, it is.

THE COURT: All right. Miss Goldman, go ahead, please.

MS. GOLDMAN: Thank you, Your Honor.

Q Dr. Strauch, have you been -- have you visited Pi'ina'au Stream, P-I-I-N-A-A-U, before November 2018?

A Yes.

Q Was that for work?

A Yes.

Q How about Palauhulu, P-A-L-A-U-H-U-L-U?

A Yes.

Q How about Waiokamilo,

W-A-I-O-K-A-M-I-L-O? Had you -- you testified that the diversions were discontinued before you started at CWRM, is that right?

A Yes.

Q Can you tell us just from what you know for that through your job why that was or how you know that?

A So Waiokamilo was originally part of the 27 stream petition filed with the Commission in 2001. Following a Land Board decision in I believe 2006, East Maui Irrigation notified us that they would be discontinuing the use of those diversions, so that's why they -- (indiscernible).

Q Are there remaining diversion structures on Waiokamilo Stream to your knowledge?

A Yes. There are a couple of 'auwai, A-U-W-A-I, or ho'ouai, the intake, which start as like little concrete or boulder structures in a stream that remove water primarily for kalo production.

Q And have you personally been to them since you began with CWRM, so while they were discontinued?

A So have I -- have I been to the East Maui Irrigation diversions or the 'auwai diversions?

A Let's do one at the time. The EMI

diversions.

A Um -- no, I have not been to the EMI diversions on Waiokamilo.

Q How about 'auwai or (indiscernible)?

A Yes, ho'ouai.

Q In what ways are those non-EMI diversions?

A They're what we call the community sources of water, kuleana sources of water that support traditional and customary practices in the area.

Q Okay. Wailuānui, W-A-I-L-U-A-N-U-I. You stated that you had been there about 120 times for work. Was that prior to November 2018?

A Not 120 times prior to 20 -- November 2018, but, yes, I had been there prior to November 2018.

Q West Wailuāiki, W-A-I-L-U-A-I-K-I. You said -- you also said you had been there about 120 times for work. Were any of those from before November 2018?

A Yes.

Q And how about East Wailuāiki? Same spelling.

A Yes.

Q Okay. And have you spent time at East

and West Wailuāiki in the past year?

A Yes.

Q What have you been doing there?

A I monitor the stream resources. As well as the diversions.

Q Are you involved in the study of those streams?

I should clarify. The study we spoke about when you previously testified in consultation with DAR regarding the difference between full and H90?

A Yes.

Q And -- okay. How about Pua'aka'a, P-U-A-A-K-A-A? Have -- had you been there prior to 2018?

A Yes.

Q Were you familiar with the diversions there because of your work?

A Yes.

Q Okay. Kōpiliula, K-O-P-I-L-I-U-L-A. Had you been between to the Kōpiliula intake at Ko'olau Ditch before November of 2018?

A Yes.

Q Waiohu'e Stream, W-A-I-O-H-U-E Stream. Had you been there before November 2018?

A Yes.

Q Have you been there in the past year?

A Yes.

Q Okay. I'd like to call your attention to just very briefly what was marked as Plaintiff's Exhibit 65 which has been admitted into evidence.

A Okay.

Q Okay. Do you recognize this photograph?

A Yes.

Q What is it?

A You're looking from the right bank at the outflow of a plunge pool in Waiohu'e with the connectivity flow pipe coming from the photographer towards the middle of the photo. The -- in the -- the stone that's been set is part of the intake from Waiohu'e to Ko'olau Ditch on the -- the lower right portion.

Q And based on your personal experience going there -- or when was the last time you went to this stream?

A Mid-July.

Q Was the connectivity flow pipe still there?

A Yes.

Q Okay. Even though it's not currently being used, can it be used again in the future --

A Yes.

Q -- to -- sorry, to clarify, is it usable?

A Yes.

Q And might there be any opportunity in the future to use that pipe again?

MR. FRANKEL: Objection, calls --

THE WITNESS: Yes.

MR. FRANKEL: -- for speculation.

THE COURT: Sustained.

Q (BY MS. GOLDMAN) That stream, is that stream one of the ones being studied?

A Yes.

Q And which is it, a full or H90 restoration stream?

A It's a full restoration stream.

Q Pa'akea, P-A-A-K-E-A. You said you had been there once before November of 2018. Could you describe it just very briefly?

A It starts in native forest at moderate elevation and the main channel flows in relatively young lava. There is two minor diversions that also contribute flow off of springs. The main stem is diverted at the Ko'olau Ditch. There are -- the -- the stream channel's dominated by bedrock. It's a gaining stream, flows down to a terminal waterfall at the

ocean.

Q Okay.

A There are one main tributary, Puakea. Puakea's also a gaining stream. Yeah.

Q Okay. Prior to the filing of this case, did you personally think of Puakea as a stream?

MR. FRANKEL: Objection, relevance.

THE COURT: Sustained.

Q (BY MS. GOLDMAN) Has Puakea been studied at all, to your knowledge -- or I'll withdraw that.

Have you studied Puakea at all?

A Um -- only in the context of it being a tributary to Pa'akea.

Q Okay. Hanawī Stream, H-A-N-A-W-I -- oh, I forgot also. Would you please just close the exhibit that was open in front of you, if you haven't already.

Thank you.

Okay. Hanawī Stream. You'd been there about 50 times. Had you been there before November 2018?

A Yes.

Q And Makapipi Stream. You'd been there about 60 times. Was that prior to 2018 as well?

A Yes.

Q Prior to November 2018?

A Yes.

Q Okay. Okay. And is there anything I haven't yet asked you that you think would be important to explain your other testimony?

MR. FRANKEL: Objection, Your Honor, form of the question.

THE COURT: Sustained.

MR. FRANKEL: Vague. Thank you.

THE COURT: I'm sorry. I said sustained. Maybe you folks didn't hear me. Sorry.

MS. GOLDMAN: Oh. Okay. That's all from the State for Dr. Strauch at this current time.

THE COURT: Okay. Thank you.

Let's see. I think we --

Mr. Schulmeister, you wanna go first?

MR. SCHULMEISTER: Okay.

CROSS EXAMINATION

BY MR. SCHULMEISTER:

Q All right. Dr. Strauch, you had some testimony about your typical East Maui site visits. Just a couple questions on that. On a typical day, would that start with an early flight?

A Uh, certain pre-COVID, many trips I would spend the night on the island. So some days, obviously, it starts with an early morning flight to get to the island. Other days it starts with an early

morning wake-up and coffee on the island, so no flight involved.

Q And what do you usually take with you?

A Um -- in terms of field equipment? I bring, you know, a day's supply of food and water, emergency clothes, emergency locator beacon, sometimes a radio, field notebook, various measuring devices, equipment, various foot attire. I have three different pairs of tabis on Maui for the different conditions, such as fishing.

Q Your measuring equipment, do you normally carry that?

A Yes.

Q And you mentioned I think that sometimes you drive and sometimes you hike. With the measuring equipment, do you have to just physically carry that by hand when you hike?

A Yes.

Q Okay. And you mentioned snorkel surveys a number of times. So just to be clear, what exactly is a snorkel survey?

A So we -- I'll -- I'll describe the process from the beginning. At a location where we will do a snorkel survey, we will measure out transects at a particular reach. So those are widths across a

stream at known intervals. And then at a specific randomized location within that transect we will do what's considered a point quadrant snorkel survey. So we tend to wear wetsuits because the water gets really cold when you're in it for that length of time. So we put on a wetsuit, we put on a snorkel, we approach the transect and the randomized location within the transect from downstream. And as you approach it, you define the boundaries of the transect.

Our goal is to do a one meter transect, but nothing in nature is perfectly defined in one meter sections or areas. And so in that quadrant that we subsequently measure, we monitor for such as three-minute length of time the number of species, we estimate the number of the -- the species, we count them -- or we estimate size, we count the number, and we identify them to the species.

Once that length of time is up, we use a folding ruler to measure the actual boundaries and the depth and then we measure the velocity through that. So that's a typical snorkel survey.

We then estimate the substrate, such as boulder, gravel, bedrock, and then the habitat, riffle, run, pool, cascade, those sorts of descriptors that go with that quantitative data.

Q So would you have snorkel surveys on like on the same site visit as taking flow measurements?

A Yeah. We would typically measure flow or have a monitoring station that's monitoring flow at the -- the stream of interest.

Q So on a visit like this on a typical -- I mean, how many hours do you actually work in a day?

A So on a day that we're doing snorkel surveys, we focus -- we can only do maybe -- and, again, it depends on how many observers you have. If you have two that are leapfrogging each other, you can get maybe two reaches done in a day, and each reach has 20 snorkel surveys. That's an entire day from, you know, being in the field from 8:00 a.m. to maybe 5:00 p.m. Certain days, you know, depending on who's with you, your team, I can spend, you know, 14 hours a day in the field, 16 hours, depending on daylight. We're mostly limited by the amount of daylight.

Q And that doesn't include travel time?

A No.

Q And so if you got up in the morning and you go and you have a day like that, then you still have to fly back?

A Yeah, I'm usually on the -- the 9:00 p.m. flight back.

Q Okay. And do you get paid overtime?
A No.
Q Do you try to be conscientious and diligent when you collect data?
A I mean, we focus our efforts to inform the Commission as best we can. So in the sense that we don't gather field work data in locations that are not important to Commission decisions.
Q And do you try to be precise when you collect and record the data?
A Yes.
Q And do you double check it before you publish it?
A Yes.
Q Do you take pride in your job?
A I do.
Q Now, is it the -- is there a surface water branch at CWRM that you're a part of?
A The Stream Protection Management Branch addresses surface water.
Q Okay. And, again, is that -- could you just kinda just briefly describe how the surface water branch is staffed and where you kind of fit into the organizational chart?
A So we have a branch chief, and then we

have two sections. The Permits & Regulations Section and the Instream Use Protection Section. We have one person who deals with permits and regulations and then I am in the Instream Use Protection Section. I supervise right now two other employees. One person manages our -- our water use reporting and national hydrography data set for the State of Hawai'i.

THE COURT: Can you --

THE WITNESS: (Indiscernible) --

THE COURT: -- please slow down a little bit.

THE WITNESS: Sorry.

THE COURT: Okay. Thank you.

THE WITNESS: We have two employees that I supervise. One of them manages the national hydrography data set for the State of Hawai'i as well as our water use reporting database and then assists me with field work as needed. One employee does -- follows up with water use reporting and assists with field work and does stream diversion verifications.

Q (BY MR. SCHULMEISTER) Okay. And is this a good team?

A Yes.

Q Now, is one of the things that you do attend Water Commission meetings and from time to time present informational presentations or Power

Points to Water Commission members?

A Yes.

Q And is that done -- what's the purpose for doing that?

A I inform the Commission on field work on efforts used to advance our development of instream flow standards, on monitoring needs, on communications. Our -- often times we collaborate with other agencies and so I will present or bring in other presentations as a collaborative effort to inform the Commission on issues that we are addressing.

Q Okay. And one of the other agencies I think you mentioned that you collaborate with is United States Geological Survey, USGS, is that right?

A Correct.

Q And from time to time there's a USGS representative who, you know, makes the presentation along with you or in conjunction with you, is that right?

A Correct.

Q Now, I think you also mentioned that from time to time the Water Commission collaborates with USGS on various studies, is that right?

A Correct.

Q Does that sometimes include the County of

Maui and Board of Water Supply as well?

A It does.

Q Could you look at Exhibit S-5?

THE COURT: Is that S as in Sierra 5?

MR. SCHULMEISTER: No, as in State 5.

THE WITNESS: Okay.

Q (BY MR. SCHULMEISTER) So --

THE COURT: It's already in evidence, right?

MR. FRANKEL: No.

MR. SCHULMEISTER: I'm sorry?

MR. FRANKEL: Well, if it is, it's for a very limited purpose, Your Honor.

THE COURT: Okay. Well, I'd have to go back and review my notes on that, but for whatever purpose it's in, it's in, right?

MR. SCHULMEISTER: Right.

Q Dr. Strauch, are you familiar with the study that's -- well, S-5?

A Yes.

Q And earlier in your testimony I think you gave some testimony about a study that had come up with 64 percent of base flow as being the flow in Hawaiian streams that corresponds to 90 percent habitat suitability. Do you remember that?

A Yes. As it applies to East Maui streams.

Q Right. Is S-5 the study that you're referring to?

A Yes.

Q Okay. And so in that, is that study one that has been relied upon and cited to frequently over the years for precisely that point about the 64 percent base flow corresponding as a result of this study in certain East Maui streams to 90 percent habitat suitability?

MR. FRANKEL: Objection, form of the question, vague, passive voice, calls for speculation.

THE COURT: Passive voice? That's a new one. What's that?

MR. FRANKEL: Passive voice. Relied on. Relied on by whom?

THE COURT: Oh. Okay. Sustained.

Q (BY MR. SCHULMEISTER) Dr. Strauch, could you look at J-14, please?

A Okay.

Q All right. And turn to Bates stamp page 000169.

A Okay.

Q All right. And, again, I believe you testified previously that you're familiar with J-14 as being the June 20th, 2018 Water Commission's Decision

and Order setting interim -- amending interim instream flow standards. Is that right?

A Yes.

Q Okay. And there's references beginning on page 000169 and continues for the next several paragraphs to studies done in 2002 and a specific reference, Gingerich, S.B. and Wolff, quote, "Effects of Surface-Water Diversions on Habitat Availability for Native Macro-Fauna, Northeast Maui," Hawai'i: U.S. Geological Survey Scientific Investigations Report 2005-5213.

Do you see that?

A Yes.

Q Is that a reference to the same study that is Exhibit S-5?

A Yes.

Q Okay.

THE COURT: Mr. Schulmeister, I think --

Q (BY MR. SCHULMEISTER) Now --

THE COURT: Mr. Schulmeister, time out. I think your question referred to 2002. I'm going to assume you meant 2005. Is that fair?

MR. SCHULMEISTER: Actually, well, the -- I think it was -- the report is dated 2005. But if you look at the first paragraph of 562 on the page I

referenced, the studies were actually conducted between 2002 and 2005.

THE COURT: Oh, I see.

MR. SCHULMEISTER: According to the findings.

THE COURT: I got it. Thank you.

Q (BY MR. SCHULMEISTER) Dr. Strauch, did you testify during the contested case hearing on the -- in the case that led to the Decision and Order that is J-14?

A Yes.

Q Okay. And do you remember who called you as a witness?

A I might be confusing like different contested case hearings officers, but the process I think it was the hearings officer that called me, but that might have been in a different contested case. So, no, I -- I could not with definitive. Sorry.

Q All right. Well, do you remember that Dr. Lawrence Miike was the hearings officer when you testified?

A Yes.

Q All right. And you don't recall if he's the one who actually called you to come in and testify?

A I think he did. It is my understanding that the hearings officer called me in the con -- in

multiple contested cases.

Q All right. Okay. That's fine.

Could you look at Exhibit AB-164?

THE COURT: 164?

MR. SCHULMEISTER: Yes.

THE COURT: Thank you.

THE WITNESS: Okay.

Q (BY MR. SCHULMEISTER) Okay. Do you recognize this document?

A Yes.

Q What is it?

A It's a summary of the interim instream flow standards established prior to -- is this before or after? It must be -- prior to the 2018 decision for East Maui streams petitioned in 2001.

Q Did you have any role in the preparation of this document?

A Yes. I --

Q What was that?

A -- helped organize it.

Q And was that at the request of Dr. Miike, the hearings officer?

A I can't remember for sure.

Q Okay.

MR. SCHULMEISTER: Your Honor, I'd like to

just note that this is one of the documents that we've asked that this was an exhibit in the CWRM case. It was marked Exhibit HO-1, H-O standing for hearings officer, and it's available on the Commission website. We got the petition also, so I'd like to move it into evidence at this time.

THE COURT: So you're saying it was an exhibit in the CWRM hearing that resulted in the 2018 D&O?

MR. SCHULMEISTER: Yes.

THE COURT: All right. And your basis for moving it into evidence is?

MR. SCHULMEISTER: Well, I would like to question the witness about it. He's already said that he was involved in the preparation of it. And I would like to have it in evidence so you can -- he also testified that he con -- that he testified at the hearing.

THE COURT: Are you introducing it for the truth of the data that's in it?

MR. SCHULMEISTER: I am -- well, I -- you know, I haven't gotten there yet because I haven't been allowed to question the witness about it. But at a minimum I think it should be admitted as a true and correct copy of Hearings Officer Exhibit 1 to the -- Exhibit 1 in the record of the contested case hearing

that led to the D&O.

THE COURT: Okay. Mr. Frankel?

MR. FRANKEL: Objection, to relevance, foundation, hearsay.

THE COURT: Okay. But do you dispute its authenticity in the sense that it was an exhibit in the CWRM hearing?

MR. FRANKEL: I have no idea and I'm not gonna fight that, Your Honor.

THE COURT: All right. Miss Goldman?

MS. GOLDMAN: The State has no objection.

THE COURT: Mr. Rowe?

MR. ROWE: The County has no objection, Your Honor, and would also like to note that this exhibit is specifically referenced in the Decision and Order.

THE COURT: Can you give me a cite to that, please?

MR. ROWE: Yes, Your Honor. So J-14 is the Decision and Order. If you look at page 154, which is the Bates number, paragraph 500 is one reference to it. I'm not sure if there are more.

THE COURT: All right. I am looking at J-14 right now and you're right, paragraph 500 references Exhibit HO-1.

All right. The objection is overruled. So

AB-164 is received.

(DEFENDANT'S EXHIBIT NO. AB-164 IS RECEIVED INTO EVIDENCE.)

MR. FRANKEL: Your Honor, is that for the truth of the matter or just --

THE COURT: Well, Mr. Schulmeister said he wasn't there yet so I guess not, not yet.

MR. SCHULMEISTER: Okay. All right.

Q Dr. Strauch, could you give a -- and I'll give you a minute to do it because I realize it may have been a while since you've looked at this, but could you explain what the preparation of this document was intended to depict for the hearings officer?

A So in prior Commission decisions, some of the IIFSs established had seasonal components to it. So there were wet season and dry season IIFSs for specific streams. And the first set of columns next to the stream name depicts that seasonal component. Although if there is no seasonal component, it says annual in parentheses under dry season.

So the -- these were based on Commission decisions I believe in 2008 and 2010. The restoration amounts I believe is the am -- additional amount that was to be restored given the draft -- or no, um -- let me read that.

MR. SCHULMEISTER: Your Honor, let me withdraw that question. I can make a more specific question if that would be helpful.

THE COURT: That's fine.

Q (BY MR. SCHULMEISTER) All right. Let's look at the column that says -- it's the next column. It says the amount EMI diverted and it has a couple of footnotes. Do you see that?

A Yes. Let me read the footnotes.

Q And I guess footnote 3 and footnote 4, and directing your attention to footnote 3. I'm sorry, footnote 4. It says the total amount EMI diverted is not the full amount diverted by the entire EMI system as the streams displayed in the table is only a subset of the streams that EMI diverts from East Maui. Do you see that?

A Yes.

Q Is that true and correct?

A Yes.

Q Okay. All right. Let's talk a little bit about the IIFS amendment process that you testified to during your direct examination. I think that you mentioned that you were involved in the IIFS amendment process at the staff level, is that right?

A Yes.

Q How many different ways are there to potentially initiate an IIFS amendment?

A We have two ways. A petitioner can file paperwork with the Commission to initiate the process or staff can initiate the process themselves.

Q Okay. And I think you'd mentioned that part of your job when there's an IIFS being considered is to look at the instream values, --

A Yes.

Q -- is that right?

What about the non-instream values? Do you also work on that?

A Yes.

Q And I think you'd testified quite a bit about what you'd do when evaluating instream values. Could you just, you know, briefly summarize what you do when you evaluate the non-instream values?

A So we look at the use. Depending on the system, the use might vary from domestic use to commercial agriculture to drinking water supply to hydropower. So we -- we evaluate what that use is. Is it a reasonable and beneficial use based on, for example, when you evaluate the -- for agriculture, the crops being grown and the amount of irrigation proposed for those crops. We look at for drinking water supply

the population served, altern -- we also look at alternative resources.

Q Okay. And I believe you used the phrase, quote, "best available information", close quote, in one of your answers on direct examination in terms of the work you do on evaluating the instream values. Do you recall that?

A Yes.

Q Is, quote, "best available information", close quote, does that phrase have a particular meaning in your job?

A Yes. We can't know everything about everything, so we use -- we often times rely on historical documents to supplement what we can gather in the field. And so we -- and we rely on other agencies to provide us with information and we don't -- we don't necessarily go out and say -- ask what every single household's water needs are. We rely on the County to provide like a summary of water uses and that's what we consider best available information.

There might be better available information if we, you know, tried to break down the use by household and/or commercial operation or resort facility, that sort of thing. But overall best available information is what the Commission relies upon.

Q Does that phrase, to your knowledge does that phrase, best available information, does that appear in the Water Code?

A I believe it does.

Q Okay. And among the information that you consult, does that include plantation historical diversion records?

A Yes.

Q Plantation irrigation records?

A Yes.

Q Plantation well data?

A Yes.

Q And when you're trying to put together historical information about diversion and irrigation historically, are the plantation records frequently the best available information on this subject?

A Yes.

MR. FRANKEL: Objection, calls for speculation.

THE COURT: Overruled.

THE WITNESS: Yes.

Q (BY MR. SCHULMEISTER) I think in your testimony this morning you made a reference. I think there was a question about how many streams in the state have status quo IFS from 1980 or so versus how

many have been set. And I think in your response you referred to a Moloka'i petition that's pending and also to something that's pending in West Maui. Do you recall that?

A Yes.

Q And in West Maui you made specific reference to something that you termed a, quote, "waste complaint", close quote. Is that right?

A Yes.

Q Does the Water Commission have a procedure for receiving and disposing of what you've referred to as waste complaints?

A Yes.

Q What is that procedure?

A When a formal complaint is made, the -- that involves surface water, the Stream Protection Management Branch evaluates it on its merits, then we issue a -- a notice of violation to the other party that's -- the complaint is against, and request a response to understand their perspective on the complaint.

And then that information, we might do a follow-up, field work, or, you know, analyze new -- other sources of information, and then we take the complaint to the Commission to either recommend some

sort of fine or recommend a modification to the system such that there will be less to -- to address the complaint, the waste issue, directly. Yeah.

Q Is this procedure provided -- I mean, if you know, is this provided for in the Water Code?

A I believe it's provided in our administrative rules.

Q Okay. And can any member of the public make a waste complaint to the Water Commission?

A Yes.

Q Okay. And does it matter whether the alleged waste is occurring on state land or private land?

A No. We evaluate all water sources.

Q Okay. And, actually, going back to the evaluations that you do for instream values and offstream values in connection with interim instream flow standards, is one of the factors that you apply in evaluations whether it's on private land versus state owned land?

A No.

Q So like, for example, in the Nā Wai ʻEhā area, N-A-W-A-I-E-H-A, of West Maui, there's interim instream flow standards that have been set and are still undergoing review at the Commission, correct?

A Yes.

Q And that's principally all on private land, right?

A Correct.

Q And, again, in West Maui there's a number of Commission initiated interim instream flow amendments that there's been publication on and some of them are set, and most of those are on private land, is that right?

MR. FRANKEL: Objection, Your Honor, relevance.

THE COURT: Hang on. Let me review the question.

Well, it's compound and then it kind of changed a little bit, frankly, in the middle. If you could rephrase, Mr. Schulmeister.

MR. SCHULMEISTER: Okay. Let me withdraw the question.

Q And, basically, let me just ask the question this way. When evaluating whether to amend an interim instream flow standard for any particular stream, is it even a factor in the analysis whether all or part of the stream is on privately owned land versus on state land?

A Only in a water use management area where

a water use permit is being issued where a applicant may have riparian rights as opposed to just an appurtenant right to water would land ownership ever come into factor. The instream flow standards is -- it -- it doesn't consider whether the state owns the land on it -- around the stream or not.

Q Okay. And just to be clear, are any of the streams in the East Maui Ditch System within a designated water management area?

A No.

Q So there are no water use permits applicable to those streams as you've just described in your previous answer, is that right?

A Correct.

Q Okay. Have you been involved at all in any of the post-Decision and Order review and evaluation of diversion modification permits in the East Maui Ditch System?

A Yes.

Q Okay. And as far as the Commission's role in reviewing and taking action on diversion modification requests, does that depend at all on whether the diversions are located on state land or private land?

A No.

Q So the juris -- the Water Commission has jurisdiction over diversions regardless of whether they're on private land or state land, is that right?

MR. FRANKEL: Objection, calls for legal conclusion.

Q (BY MR. SCHULMEISTER) To your understanding.

THE COURT: His understanding. Yes, go ahead.

THE WITNESS: Correct.

Q (BY MR. SCHULMEISTER) Now, you recited very impressively from memory a lot of detailed descriptions of diversions on various streams. So I'm gonna test you. I'm gonna ask you about one.

Are you familiar with the Puolua, Puolua is P-U-O-L-U-A I believe, Stream at the Lowrie diversion?

A Pu'u -- Pu'ulua?

Q Yes, the tributary of Hanehoi, H-A-N-E-H-O-I.

A Oh. Okay. Got it. Yes.

Q All right. So is there a diversion at that location?

A There -- yes.

Q Are you familiar with that one?

A Yes.

Q And that's one of the streams that is a

full restoration stream under the D&O, correct?

A Yes.

Q Is there still some water going into the Lowrie Ditch at that location?

A I have not been to that location in maybe six months so I could only testify to -- prior to modifications to that.

Q Okay. Well, let me just ask you this. Do you know whether that stream goes all the way up to and is also diverted at the Wailoa Ditch?

A I don't believe it is, no.

Q Okay.

THE COURT: Mr. Schulmeister, we've been going 50, 5-0 minutes. Can we take a break now or do you want to finish up in the area or?

MR. SCHULMEISTER: You know what, I am so close to being done, you know. I am so close to being done. Let me just take a quick look.

You know what, I don't have anything further.

THE COURT: All right. Thank you.

We'll take our recess now, for 11 minutes. So I'll see you back here at 11:00 a.m. Thank you.

We're in recess.

(Recess taken at 10:49 a.m.)

(Proceedings resumed at 11:01 a.m.)

THE COURT: Back on record.

FTR on?

THE BAILIFF: Yes, it is.

THE COURT: All right. Thank you.

Mr. Schulmeister, you're still concluded or do you have any additional questions you thought of during the break?

MR. SCHULMEISTER: No, I'm done for now until I hear how the rest of this goes. Thank you.

THE COURT: All right. Thank you.

All right. So let's go with Mr. Rowe next and then have Mr. Frankel.

MR. ROWE: Thank you, Your Honor.

CROSS EXAMINATION

BY MR. ROWE:

Q Dr. Strauch, have you ever taken members of the Commission on Water Resources Management on a site visit of East Maui streams?

A Yes.

Q Can you tell us a little bit about what you showed them?

A Depending on the specific day, locations where instream flow standards were to be established or already had been established, some representative diversion structures, the streams themselves, various

stream resources if easily accessible or visible.

Q And did you perform one of these site visits in conjunction with the 2018 Decision and Order?

A Yes.

Q And do you recall who was there?

A The entire list of participants?

MR. ROWE: I'll withdraw the question, Your Honor. I have nothing further.

THE COURT: All right. Mr. Frankel.

MR. FRANKEL: I'm chomping at the bit, Your Honor. Thank you.

THE COURT: Be careful what you ask for.

CROSS EXAMINATION

BY MR. FRANKEL:

Q Dr. Strauch, you provided a lot of detailed information about streams today and on Friday, right?

A Yes.

Q Did you provide that level of detail to the Board of Land and Natural Resources in 2019?

A No.

Q And in 2019, did you provide to the Board of Land and Natural Resources any criticisms of Dr. Parham's study which is in A&B's draft EIS?

A No.

Q Okay. And, you know, by the way, have you ever taken the Board of Land and Natural Resources members to a site visit of East Maui streams like you did with the Water Commission?

A No.

Q Okay. So I wanna ask you some questions about diversion structures on specific streams in East Maui, and I wanna start with Waiohu'e Stream, W-A-I-O-H-U-E. You've been to Waiohu'e Stream about 80 times, right?

A Yes.

Q And when were you there last?

A Mid-July.

Q Okay. And you're familiar with the beautiful pond and waterfall by the Ko'olau Ditch there, right?

A The plunge pool?

Q Yes.

A Yes.

Q Okay. Let's take a quick look at it to refresh everyone's memory there. Exhibit 67. Sierra Club's Exhibit 67.

A Okay.

Q Got it there? And that's what we're talking about, that area?

A That's the plunge pool you were referring to?

Q Is that right? Okay.

And now, are you familiar with recommendations that the Division of Aquatic Resources made regarding the modification of diversion structures back in April 2010?

A In relation to this specific diversion?

Q Well, let's just take it one step at a time. We'll get there. But are you familiar with the fact that they wrote a letter back in April 2010 regarding structures on various streams in East Maui?

A Yes.

Q Is that -- okay. So let's take a look at Exhibit J-23.

A Okay.

Q And so you've seen this before, right?

A Yep.

Q And let's turn to page -- the page 11, the number's at the very bottom of the page.

A Okay.

Q Are you -- so, you know, back then the Division of Aquatic Resources recommended the digging of a channel to lower elevation to allow overflow water to go down the right bank. That's what they

recommended back then, right?

A Um -- that is one recommendation. They also provide a simple recommendation as described above, provide passage at waterfall pool.

Q Sure. You don't think that the narrative below is a description of how that diversion -- that modification would be made.

MS. GOLDMAN: Objection, Your Honor. This is outside of the witness's scope of personal experience.

THE COURT: Well --

MS. GOLDMAN: He's just reading something that's already been admitted into evidence.

THE COURT: Okay. I'm not -- I'm looking at the question in print and it's not as clear as I'd like it to be. Could you rephrase?

MR. FRANKEL: Sure.

You know what, I'm just gonna leave it at that. That's fine.

Q My question to you, Dr. Strauch, is the recommendation in the text below what I'll call the box, that has not taken place, has it, based on your observation? The modification of K-13 intake into Ko'olau Ditch would involve digging of a channel to lower elevation. That specific modification has not taken place, has it?

A Not with the establishment of full restoration, the ditch intake has been closed, which increases the elevation of the plunge pool to the point where digging a said channel would not be necessary.

Q Right. And so if we look at Exhibit J-21, J-21 now.

A Okay.

Q And if you turn to page 161 of this exhibit.

A Okay.

Q And have you seen something like this before? If not this exact chart, charts similar to this before?

A Yes.

Q Okay. And if we look at this chart and we look at what's going on with Waiohu'e Stream, which -- yeah, it is on page 161 towards the bottom there, Waiohu'e Stream, and this is information that was given to the Board of Land and Natural Resources before its 2019 meeting, and just as you said that sluice gate was closed, and that's what you're saying has happened. The sluice gate closed and therefore there's water that's flowing over the dam now, right?

A So the control gate at the intake has been closed. The sluice gate is removed because you

don't need to sluice material out, so yes.

Q Okay. So the control gate is closed. Now, the gate that EMI installed there, that's not gonna last forever, is it?

A I mean, how do you -- how long do you define forever?

Q Well, is that -- forever's forever. Is that gate gonna last forever?

A I mean, again, it will last two -- two decades, yeah.

Q That's not my question. Is that gate gonna last forever?

A It's possible.

Q You've seen how it's constructed?

A Yeah.

Q And you're telling me you think it's gonna last forever?

A No, I think it's possible.

Q And so there's a possibility it may not last forever?

A Correct.

Q And if it doesn't last forever, the water's gonna flow into the ditch?

A Yeah.

Q Digging a channel is a more permanent

fix, isn't it?

A So I guess -- I'm gonna reph -- I'm gonna qualify my answer in saying when I say yes, water will flow into the ditch, it flows into the transmission ditch, not the Ko'olau Ditch.

Q That's fine. But also it's not flowing into the stream anymore (indiscernible) --

MS. GOLDMAN: Objection, Your Honor. Argumentative.

THE COURT: Overruled.

THE WITNESS: So can you re -- can you rephrase the question or tell me the question again?

Q (BY MR. FRANKEL) If that gate, for lack of a better word, were to collapse, or break, degrade, the water then would no longer be flowing directly into the stream, it would be diverted out of the stream, right?

A Correct.

Q Now, has the Board of Land and Natural Resources ordered EMI or A&B to do the modification specifically recommended by the Division of Aquatic Resources, yes or no?

A I don't attend every board meeting so I don't -- I can't answer that.

Q And so as far as you know, no such order

has been made as far as you know?

A As far as I know that the Commission has established full restoration and EMI has complied.

Q Okay. But I'm talking my focus here is on diversion structures. So as far as you know, as far as you know, the Board has not ordered EMI or A&B to follow the recommendation that the Division of Aquatic Resources issued back in 2010, correct?

A Correct.

Q Okay. I wanna turn to another diversion structure. And let's talk about Puohokamoa Stream.

MR. FRANKEL: And, Your Honor, I don't -- do we have the same court reporter as we had before? Or should I spell it all out?

THE COURT: No need.

MR. FRANKEL: Okay. Thank you, Your Honor.

Q Now, in 2010, the Division of Aquatic Resources remember -- sorry -- recommended incorporating v-notches into three diversions. Does that sound familiar?

A Yes.

Q And that has not taken place, right? Right?

A Correct.

Q And we know that in part by looking again

at Exhibit J-21, which is that sort of for lack of a better word spreadsheet that was provided to the Board of Land and Natural Resources?

A Correct.

Q Okay. Now, has the Board of Land and Natural Resources ordered EMI to do the modifications recommended by the Division of Aquatic Resources as far as you know?

A No.

Q Is there -- okay. Great. Now let's talk about Hanawī Stream. Can you just really briefly describe for the court what Big Spring is and what's kind of unique about it?

A So the geology of the Hanawī area which includes Hanawī watershed but also neighboring watersheds is pretty unique. There are a lot of what we call perched water bodies. Think of it as like a pancake of concrete that are -- it's sub -- subsurface.

And so you get a lot of rainfall in that region and this is one of the wettest parts, if not the state, the world, and a lot of that infiltrated rainfall doesn't make it to the base of the aquifer. It hits that concrete pancake, flows horizontally, and when the stream has incised or eroded away at that pancake, that -- that horizontal flow of water springs

as a spring into the stream channel.

Big Spring is one of, you might imagine, the larger springs in the area and contributes a lot of flow to the lower reaches of Hanawī Stream.

Q And Big Spring certainly makes Hanawī a gaining stream, correct?

A Correct.

Q Now, in 2010 the Division of Aquatic Resources recommended incorporating a v-notch on the dam wall right bank. Are you familiar with that recommendation?

MS. GOLDMAN: Objection, Your Honor, asked and answered.

THE COURT: Overruled.

THE WITNESS: Yes.

Q (BY MR. FRANKEL) So and that again, so that's in Exhibit J-23 at 12. That recommendation is there under the table there. That's a recommendation that's made. And you understand that the purpose of this was to allow for the animal passage and to reduce entrainment of larvae, right?

A Yes.

Q And given the huge volume of water from Big Spring, the key to restoration habitat in Hanawī is establishing that good connection. It's rather than

putting lots of water back in the stream, it's to ensure that the species can get -- move back and forth and they don't get entrained, right?

A Correct. But a v-notch is not the only way to achieve connectivity.

Q Now, the v-notch has not been put in the dam wall, correct?

A Correct.

Q BLNR has not ordered a v-notch be installed, correct?

A Correct. The Commission has jurisdiction over structures in the stream channel.

MR. FRANKEL: Well, move to strike, Your Honor, nonresponsive.

THE COURT: Sustained.

Q (BY MR. FRANKEL) So instead of a v-notch, what's happened so far is a sluice gate has been altered, is that right?

A When you say -- what do you mean by altered?

Q Well, let's take a look at Exhibit J-21, again, that sort of spreadsheet at page I think it's 161. Yeah.

And maybe I shouldn't -- you're right, the word shouldn't be altered, it's been adjusted. Do you

see on page 161 of Exhibit J-21 it talks about Hanawī Stream and it talks about adjustments to the sluice gate in yellow?

A Yeah.

Q Do you see that?

A Yes.

Q And that's your understanding as well, right, the sluice gate has been adjusted?

A Yes.

Q Now, that sluice gate will not last forever, will it?

A No.

Q Okay. I wanna switch gears from structures to stream flow. Now, you're familiar with the status quo standard you testified, right?

A Yes.

Q The standard was whatever was flowing on June 15th, 1988.

A Yes.

Q And that was based on existing water diversion?

A Yes.

Q And that is the standard for 13 streams in East Maui, right?

A Uh -- are you referring to the main stem

of 13 hydrologic units, yes.

Q And that standard was not based on the biological value of those streams, right?

A No.

Q Or the ecological value?

A No.

Q And it was not based on the recreational value of those streams?

A I don't think so.

Q And so the 1988 standard did little more than ratify the existing diversion.

A I don't know what you mean by ratify.

Q All right. Let's move on.

So and this might -- I hope this is not gonna be tedious. I want to try to summarize some of the information that Miss Goldman walked you through.

I wanna ask you about the restoration status of the streams in East Maui. Just the streams, not the tributaries. I just wanna focus on the streams as you defined them. So in 2018 the Water Commission ordered full restoration of nine streams, is that right?

A I believe so.

Q And of those full restoration streams, Waiokamilo ends in a terminal waterfall, is that right?

A Yes.

Q Okay.

A I mean, there are -- there are other streams that end in terminal waterfalls in East Maui.

Q Right. But we're just talking about the full restoration streams and one of them ends in a terminal waterfall, right?

A Yes.

Q Now, the Water Commission required that 64 percent of the base flow remain in five streams, is that right?

A Yes. And I don't have the numbers memorized. I mean, I can count 'em off, but, yes. I'll go with yes.

Q Well, would it help if I listed them off for you or are you comfortable --

A I'm fine. No, I'm fine with five. That's fine.

Q Okay. And of those 64 percent base flow streams, Waikamoi ends in a terminal waterfall, right?

A Yes.

Q And there are approximately five native species that can get up over a terminal waterfall, right?

A Um -- there are two fish, um -- one shrimp, and one mollusk that are the best climbers that

would be able to inhabit a habitat above waterfalls. So I would say four.

Q All right. And, again, going through this list, this gets a little confusing, but the Water Commission allowed all but 20 percent of the flow of seven or eight streams to be diverted in connectivity streams. Does that sound right?

A Twenty percent of the median base flow, yes.

Q And that's for seven or eight streams?

A I'd have to count them on the list. Sorry.

Q Okay. All right.

Now, let's switch gears. We're making good progress. Switching from the amount of water that's flowing in these streams, you don't know how the water taken from East Maui is actually used or has been used in 2019 or 2020, do you?

A Um -- the actual application of the water to a specific use? No, we don't get that information. We only are -- are only -- the diverter is only responsible to report the amount diverted to us.

Q Thank you.

Again switching gears, you described invasive species like bamboo and strawberry guava near streams

when Miss Goldman was asking you questions earlier. Now, was that within the revocable permit area or outside the revocable permit area?

A Depends on the watershed.

Q Okay. So sometimes some of those conditions you were describing are in the revocable permit area and sometimes it's outside the revocable permit area?

A When you say revocable permit area, do you mean state owned property?

Q Yes.

A Yes.

Q Okay. And have you ever seen in all your time spent in the East Maui watershed, have you ever seen folks from East Maui Irrigation working to eliminate, get rid of invasive species in the watershed?

A Uh, only in areas that are along acc -- accessible, you know, roads and trails and that sort of thing, not as a general maintenance of the watershed.

Q In other words, to make sure the road or trail is clear, not to get rid of the species?

A Correct.

Q Okay. Now, you visited Waipi'o Stream for the first time this year, right?

A Yes.

Q July and August?

Out loud?

A Yes.

Q Thank you.

Were diversions taking water from the stream at that time?

A Um -- not at the New Hāmākua Ditch. And at the, um -- at the Haʻikū Ditch the sluice gate was open, but at the Lowrie Ditch I wasn't able to get to the -- all the intake so I can't say so.

Q And is New Hāmākua the highest diversion on that particular stream?

A Yes.

Q And so Wailoa doesn't go --

A Wailoa does not take any water. It's -- the stream is too small and ephemeral and there's -- there was no design of an intake for the Wailoa Ditch.

Q Okay. Now, before you testified on Friday you'd seen some of the photographs the Sierra Club's using in this trial, right?

A Yes.

Q And were you given the individual photographs or did you get an email that was forwarded to the attorneys back on March 12th?

A I don't remember. Um --

Q Was it in email form or was it a single photo? In other words, was the email with lots of photos or just individual photos?

A Just individual photos.

Q Okay. And when were you given those photos?

A I don't know.

Q Well, were you given them in -- I don't need the exact date. Were you given them in March, April, May, June?

A No, more recently.

Q So probably not. So July maybe?

A Yeah, that would sound about right.

Q Okay. So you followed up on those photographs specifically because of this trial?

A Not really. Um -- I do field work as part of a routine, you know, work, and so no, none of my -- none of my field work was specific to this trial. It was just, um -- when we had a ban on interisland travel starting in mid-March, I had to cancel maybe 14 trips to Maui, and so I tried to fit in as much as possible in June, July, and August.

Q But you were not given these photographs until July, right?

A Right.

Q Okay. And by the way, have you looked at the plaintiff's or the Sierra Club's trial memoranda that was filed in this case?

A I don't think so.

Q Okay. All right. So I wanna talk to you about trash or treasure. If you could take a look at Exhibit AB-63.

A Okay.

Q And if you could take, you know, a minute to just sort of scroll through those photographs.

A Oh, there's more than one? Okay.

Okay.

Q Have you ever seen debris like this in the area encompassed by the revocable permits in East Maui?

A To some of the old rail structure I have seen, um -- not those -- do you want me to be specific? Um, I -- some of the old wrought iron stuff definitely.

Q And when you say you've seen it before, would you say your observations were relatively recent or you saw them a long --

MS. GOLDMAN: Objection.

Q (BY MR. FRANKEL) -- time ago --

THE COURT: Let him finish the --

MS. GOLDMAN: (Indiscernible).

THE COURT: Let him finish the question, please.

All right. Dr. Strauch, we're about to have a question and then an objection, so please don't answer the question right away. Thank you.

Q (BY MR. FRANKEL) So when you say you've seen these things or things like this in the revocable permit area, my question were those observations made relatively recently or in 2018 or in 2017? Can you give us some sort of ballpark when you would have seen, when you did see materials like this within the revocable permit area?

THE COURT: Okay. Miss Goldman.

MS. GOLDMAN: Objection, Your Honor, over broad, compound.

THE COURT: Overruled. It's general, but we gotta start somewhere. Go ahead.

THE WITNESS: Yeah. For 2018 I've seen some wrought iron in the state owned portion of the watersheds.

Q (BY MR. FRANKEL) And maybe if you could, when you say wrought iron, maybe it might help the record if looking at Exhibit AB-63 you could tell us which photograph sort of most is similar or resembles

what you mean by wrought iron? Which page?

A Um, the -- I think it's 9, page 9 or photograph 9, the -- like you can -- old railroad rails which were used to transport material from tunnels, and then were often incorporated into stream diversions.

Q All right. And, you know, you've described just the impressive amount of work you do, and so I'm not attempting to denigrate you whatsoever. But I wanted to know, did you ever ask anyone at EMI to remove the debris that you'd seen, that looked like the photo, that sort of resembled some of the stuff in page 9 of Exhibit AB-63?

A No, because they are often incorporated into structures built for stream diversions, so I just figured they were material in -- waiting to be used.

Q And in fact, Dr. Strauch, have you seen disconnected PVC pipes hanging from any of the waterfalls in the revocable permit area?

A Um -- when you say disconnected, are you -- were they -- are you implying that they were connected together and then they were just separated out? Or just like a PVC pipe that doesn't flow -- isn't connected to the ditch itself?

Q Well, you know that for some of these streams EMI had in focusing to restore the amount of

water flowing in these streams, they've had to disconnect certain pipes to ensure the amount of water remains in the flow. Does that make sense?

They've disconnected pipes that were diverting water before, and they disconnected them so they can't divert the water anymore.

A Disconnected them from like from the spring source?

Q No. I -- well, who knows where the disconnection is, but they're hanging in midair. Have you seen a pipe hanging, a PVC pipe hanging in midair above or within a waterfall?

A Can you give a photo of an example?

Q I cannot. But maybe if you thought of Waiokamilo Stream, can you think of any plastic pipes that are hanging along the waterfall there?

A So Waiokamilo is the one watershed that I didn't have to visit any of the diversions from or that I had --

Q All right.

A So I'm not familiar with those, sorry.

Q All right. Have you seen any PVC pipes that are sort of in midair anywhere in the East Maui watershed that do not appear to have any function?

A No.

Q Okay. When you went in on your visits in July and August 2000 -- this year, did you see anything that could be characterized in the way you characterize things as trash, debris, or garbage?

MS. GOLDMAN: Objection, Your Honor, vague as to the location of where he would have seen something of that nature.

THE COURT: Well, we'll see if he answers yes and then we'll see if we get into the details. Overruled.

THE WITNESS: Yeah, I've seen what I would consider debris or garbage in the stream.

Q (BY MR. FRANKEL) And that's within the revocable permit area?

A Not usually. Um -- I mean, my experience has largely been in the agricultural zoned areas, like the lower say 25 percent of each of the watersheds, other than the -- the small watersheds. That's where a lot of the trash gets, um -- collect -- or gets transported by runoff, you know, from the neighboring, um -- regions and get stuck.

Q I understand. My preface to my question was your recent visit in July and August 3rd. So my question is about those visits. And I don't know if that's one, two visits, or four visits, but in this

very recent timeframe, within the last month or so, have you seen debris, trash, garbage within the revocable permit area, again, within this time period?

A Uh, yes.

Q And where was that?

A That was in Nā'ili'ilihaele.

Q And what did you see there?

A I saw an old, um -- iron pipe that had -- may have been used as a -- to convey water or to convey a control line between the Wailoa and New Hāmākua Ditches on the side of the road, the access road.

Q Did you see any other garbage, debris, trash, anything like that within again this last month or so within the revocable permit area?

A I'd have to really think about it. Um -- yeah. Um -- between the New Hāmākua Ditch intake and the Old Hāmākua Ditch intake on Ho'olo -- Ho'olawanui there was a piece of what I estimate or guess to be a part of the diversion structure that had been damaged.

Q And I know you have a lot to do. But have you asked anyone from EMI to remove these two things that you observed fairly recently? Have you had the time to do that?

A I notified them of the former, but not

the latter. I hadn't had time to follow that.

Q Okay. And so when did you let them know about the former? When would that have been?

A A couple weeks ago. I don't -- I don't remember the specific date.

Q Right kind of before trial started?

A I would say end of July.

Q Okay. All right.

So let's take a look at Exhibit 56, Sierra Club's Exhibit 56.

A Okay. Is it the Water Use Report?

Q I'm sorry. Not the -- Sierra Club's, not the -- it's a photograph you'll recognize.

A Okay.

Q So this pipe diverts water from a spring to the stream and then into the EMI ditch, right?

A Correct.

Q And you don't know where the water from the spring would flow if not for this pipe. Precisely.

A Well, sometimes spring flow didn't ever have a precise direction, and it was very -- you know, depending on the contours of the -- the landscape, you know, it could spread out.

Q Sure, and it could -- it may flow over the waterfall there, the Ho'olawanui Waterfall you

described, without having to go over the lip itself. It could go in there where there is no lip.

A So the spring is upstream of the main Wailoa intake and it would -- based on the channel and the riparian area, it would most likely flow directly into the stream itself. So I -- you know, there is basalt along the right bank that -- bedrock that would confine it to the current channel. I doubt it would flow anywhere other than where the current flow is.

Q So then this pipe may not be necessary to convey the water to this part of the stream?

A So these sorts of diversions were -- more directly conveyed the water. So they were placed at the start of a spring. So you wouldn't lose water to -- in a diffused flow or to evaporation. It would transport it -- transport it directly from the spring to the stream.

Q And so water that might be used by plants or whatever in the area is completely captured so it can be taken up to Central Maui, right?

A So that riparian area is dominated by non-native species, so, yes, they would have used water, but they're doing well already.

Q To your knowledge has the Board of Land and Natural Resources -- I take it back. Have you ever

discussed or shown this pipe to the Board of Land and Natural Resources?

A No.

Q And to your knowledge has the Board of Land and Natural Resources ever determined that this pipe does not mar natural beauty?

A No.

Q Okay. Let's turn to Exhibit 57.

A Okay.

Q So you were given this photograph by your attorney within the last -- sometime in July, right?

A Yeah.

Q Were you able to see it on your recent visit?

A Yep.

Q And would you agree that it's disconnected?

A Yes.

Q Did you ask EMI to remove it?

A No. That would not be appropriate. The Water Commission would have to judge that that ir -- diversion would be not needed, and so there would be an abandonment process that would have to take place.

Q Okay. Let's look at Exhibit 58.

A Okay.

Q You remember talking about this photograph earlier, right?

A Yep.

Q You called this a stilling well.

A The structure on the left-hand side, yes.

Q And, actually, to take a step back. So when you are -- to get to this area, do you drive up Lupi Road, is that right?

A Yes.

Q And just before you get to this area there's basically a bridge over the stream, right?

You have to drive over?

A There are multiple bridges across multiple streams in the area, yes.

Q But to get to this particular area, right in this area there's a bridge nearby, right?

A I mean, I would assume so, yes.

Q Well, when you descend from that elevation down into the stream bed. Right?

A I mean, are you telling me what I did?

Q Well, what does one do to get to this -- where the photograph is? One would have to descend from the roadway down into the stream bed, right?

A I mean, I didn't take the photograph so I

don't know how.

Q Well, you did testify that you went to this area just a few weeks ago.

A To this area, not to where this photograph was taken.

Q Oh. So you didn't see this pho -- you did not go to this specific area on your recent visit?

A When you say area, can you define area then?

Q Did you actually see the area depicted in this photograph or not?

A No.

Q Oh. Okay. Then -- okay. I did not understand that. Okay.

So do you -- there is a big tunnel that is above and a few, maybe a hundred feet above where this area is depicted, isn't there?

A So when you say big tunnel, do you mean the tunnel that is transporting the Wailoa Ditch or?

Q It's a tunnel that's empty that you could walk in. It may lead to the Wailoa Ditch. That I don't know. But I'm asking you whether there's a big tunnel up there that's dry, that you've ever seen?

A So there are multiple access tunnels, yes.

Q And is there one in the area of the stilling well?

A Yes. I mean, that's what we're looking at.

Q Well, that's interesting.

All right. Have you seen this stilling well in operation?

A No.

Q So you don't know that it's still in use, do you?

A I don't think it is because the actual gage house is missing.

Q Huh. So that pipe that's in this photo that leads to the stilling well is going to a stilling well that you believe is no longer in use?

A Correct.

Q Okay. So that pipe is not in use?

A Correct.

Q And this is -- how far away would you say this is from where water is flowing from the stream that you have seen?

A I would -- so I would guess that it's probably a few hundred feet.

Q Okay. Now let's go look at Exhibit 61.

A Okay.

Q You've been to Hoalua Stream about 120 times, right?

A Yeah.

Q And you've seen this pipe?

A Yep. But not 120 times.

Q That's fair. Have you presented a photograph of this pipe to the Board of Land and Natural Resources?

A No.

Q To your knowledge has the BLNR ever determined that this pipe does not mar natural beauty?

A No.

Q Okay. Let's take a look at Exhibit 65.

A Okay.

Q This pipe used to serve a purpose, right?

A Yes.

Q But it no longer does?

A Not at this very moment, correct.

Q And you have not asked EMI to remove it, correct?

A We have not, no.

MR. FRANKEL: Thank you.

I have no further questions, Your Honor.

THE COURT: All right. Thank you.

Let's see, back to you, Miss Goldman. Let me

ask. It's quarter of. What's your guesstimate on how much more time?

MS. GOLDMAN: Just a few questions, Your Honor. Hopefully not more than ten minutes.

THE COURT. Okay. Hang on. Let's go off record for a second.

(Off record.)

THE COURT: All right. We'll continue.

Thank you. Go ahead.

Back on record.

MS. GOLDMAN: Thank you, Your Honor.

REDIRECT EXAMINATION

BY MS. GOLDMAN:

Q Dr. Strauch, just a couple things. To your knowledge, who has jurisdiction over the diversion structures in a stream?

MR. FRANKEL: Objection, relevance, calls for legal conclusion, lacks foundation.

THE COURT: I'll allow it as to his understanding, but this might be the fifth time the court's been told about this.

THE WITNESS: The Commission on Water Resource Management issues permits for stream diversion works and stream alteration permits.

MS. GOLDMAN: Okay.

Q You also mentioned that there are more ways to ensure connectivity than by inputting a v-notch into a diversion structure. Could you give an example please of one of the other ways?

MR. FRANKEL: Objection, calling for expert testimony.

MS. GOLDMAN: Your Honor, it's directly responsive to a line of questioning clearly opened by plaintiff.

THE COURT: Overruled.

THE WITNESS: So a wedded path can be provided for across the dam face which a -- a flow of water would provide that connectivity for recruitment or migration upstream of native indigenous species. The wedded pathway is achieved in a number of situations in East Maui by prior modifications to the diversions in certain locations.

Q (BY MS. GOLDMAN) Okay. And just quickly, drawing your attention back to the exhibit you looked at previously, it was AB-63. Could you bring that up again, please?

A Okay.

Q Okay. Could you just flip through so we know you've seen all of the photographs, please.

A Okay.

Q Okay. And from what you can tell from the photos, are these materials still littering any stream bank?

A No, I don't see any streams in -- in these photos.

Q And finally, AB-58, please.

A Okay.

Q Although this stilling well is not currently in operation, to your knowledge is there anything that would prevent it from becoming operable again one day?

A I guess, um -- AB-58 is -- I'm looking at --

Q Oh, I apologize. Plaintiff's 58. Thank you for clarifying.

A So the stilling well would need to be cleaned out or ensured that there was no debris inside it and then a new gage house could be put on top of it. And then with the existing pipe, the -- if it was continuous with the ditch, then it could still be operated.

MS. GOLDMAN: Thank you, Your Honor. That's all from the State for this witness at this time.

THE COURT: Thank you.

Thank you. Mr. Schulmeister?

MR. SCHULMEISTER: I have no questions.

THE COURT: Mr. Rowe?

MR. ROWE: I have no further questions, Your Honor.

THE COURT: Mr. Frankel?

MR. FRANKEL: Just one quick question, Your Honor.

RECROSS EXAMINATION

BY MR. FRANKEL:

Q Dr. Strauch, have you seen where the end of this pipe is? Or both ends have you seen where they end?

A One ends in the stilling well. I have not been into that tunnel specifically, no.

MR. FRANKEL: Okay. No further questions.

THE COURT: Miss Goldman?

Sorry. I think you were muted. I didn't hear anything.

MS. GOLDMAN: Oh. Nothing further from the State. Thank you.

THE COURT: Mr. Schulmeister?

MR. SCHULMEISTER: No further questions.

THE COURT: Thank you.

Mr. Rowe?

MR. ROWE: No further questions, Your Honor.

THE COURT: I think that's it.

All right. Dr. Strauch, thank you for your participation these last couple of days. Your testimony is concluded and you are free to go.

THE WITNESS: Thank you, Your Honor.

THE COURT: All right. Let's go off record and talk about our lunch break.

(Off record.)

THE COURT: All right. 1:00 o'clock. See you all then.

MR. FRANKEL: Thank you, Your Honor.

(Recess taken at 11:53 a.m.)

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STATE OF HAWAI'I)
)
CITY AND COUNTY OF HONOLULU)

I, A. HAUNANI HO, RPR, CSR 372, Official Court Reporter, First Circuit Court, State of Hawai'i, certify that the foregoing pages comprise a full, true, and correct transcription of the proceedings had in the above-entitled cause, transcribed by me to the best of my ability.

Dated this 17th day of August, 2020.

OFFICIAL COURT REPORTER

/s/ A. Haunani Ho

A. HAUNANI HO, RPR, CSR 372