AFTERNOON SESSION

April 7, 1997

THE COURT: All right, sir, if you'll take the stand again, please.

Thank you.

CONTINUED DIRECT EXAMINATION

BY MR. SMART:

Q Dr. Melone, before lunch we were talking about Exhibit 1362, which, as I understand it, was the tabular form of your information concerning the height of Dike District 12's dike above the Burlington Northern Bridge as surveyed by you in 1993 versus the design drawing elevations that you took from the 1955 design specifications for that same dike; is that correct?

A That's correct.

Q And the right-hand column, then, is the difference plus or minus between what was actually surveyed by you in 1993 and what you learned from your review of the design specifications; is that correct?

A That's correct.

Q Now, do you know that the dike was actually built to the design specifications?

A The design drawings I had were the elevation that it was meant to be constructed to. It was not an as-built drawing.

Q Okay. Were you unable to find any as-built drawings?

A I did not locate an as-built drawing, but it was the design for the intended elevations for that dike.

Q So would it be a correct statement that as far as the record for your review is concerned, you were unable to

see exactly what they built it to, but you've compared the actual 1993 elevations to what the specifications called for in 1955?

A That's correct.

Q And, in your experience, are there sometimes variations between what the specs call for and what the as-built condition is?

A There sometimes are variations.

Q Now, you also indicated earlier, before lunch, that in your opinion there had been no change in the elevation of Dike District 12's dike that affected flood levels in the 1990 flood. Do you recall that testimony?

A That's right.

Q All right. Well, if the average change in Dike District 12's dike was, as you indicated on this second page of 1362, six inches, how is it then that there was no change that affected flood levels during the 1990 flood?

A Well, I compared the flood levels from 1990 to the actual and design elevations that were intended for that dike district levee. Conceptually, if the water never

gets that high it can't be a factor.

What I discovered in making the comparison, in every case, the difference between the flood level we had in 1990 and the design elevation for '55 was greater than three feet, so the 1990 flood never got within three feet of what that levee was designed for, so even if there was another six inches added, on average -- again, there was some points that were even lower than designed, but even on average, six inches, that just meant the water was three feet six inches lower than the levee crest, but in every case the 1990 flood was greater than three feet below what the levee was built to in 1955.

Q In a minute I'm going to have you come down here and see

if you can draw that on a piece of butcher paper for the jury, but before I do that, can you identify 1363, and is that, in tabular form, the results of the comparison that you made with respect to the design elevations and the actual survey data?

A That's correct.

MR. SMART: Offer 1363, Your Honor.

MR. HAGENS: Your Honor, may I examine?

THE COURT: Yes.

MR. SMART: And I might ask one more foundational question.

Q So 1363 is simply a mathematical computation, taking the information on 1362 and comparing it to the actual water surface elevations that you determined from the 1990 flood, correct?

A Correct.

MR. HAGENS: This was prepared on 4-3-97?

THE WITNESS: It was printed on 4-3-97.

MR. HAGENS: Okay. I'm trying to get an understanding here, was the 1993 -- I asked him if the 1990 flood elevations from KCM modeling results, that column was obtained from your model; is that right?

THE WITNESS: That's correct.

MR. HAGENS: And the design elevations came from the design of the levee relocation; is that right?

THE WITNESS: That's correct.

MR. HAGENS: This only applies to an area north of where the relocation started; isn't that right?

THE WITNESS: That's correct.

MR. HAGENS: Beginning of the relocation?

THE WITNESS: The beginning of the relocation.

MR. HAGENS: Does this Exhibit 1363 tell us or the jury whether or not the strength of any of these levees have changed since 1955?

THE WITNESS: This exhibit only addresses the height of the levee in comparison to the flood level.

MR. HAGENS: So when you say levee profile, you mean levee height; is that right?
THE WITNESS: Which column are you reading from?
MR. HAGENS: I'm talking about the summary of the exhibit on top, says Skagit River Dike District 12 Levee Profile. It should be levee height; isn't that right?
THE WITNESS: Another term for a survey along the levee is a profile.
MR. HAGENS: Well, Your Honor, we think it's somewhat a misnomer to call it a profile, which envisions somebody's facial contours. This seems to be more of a height measurement than a profile, so -- and also we have not been provided this before, so on those two grounds we would object.
THE COURT: Are you saying you've not had access to the underlying data?
MR. HAGENS: We may have had access -- did you provide us with the underlying data, Mr. --
THE WITNESS: Yes, you have seen it.
THE COURT: Okay.
Mr. Anderson?
MR. ANDERSON: No objection, Your Honor.
THE COURT: All right. 1363 will be admitted.

(Whereupon, Defendant's Exhibit No. 1363 was admitted into evidence.)

Q (By Mr. Smart) All right. Let's do it this way.

Before I get you down here just to draw the concept for the jury, I'd like to go over the Exhibit 1363. Again, you've indicated on the right-hand column of 1362 that there are these differences, over on the right-hand side, of actual height versus design height of the Dike District 12 levee, correct?

A That's correct.

Q And then 1363 compares the actual and design height to the water surface profile that you determined to have occurred during the 1990 flood, so that in column one of 1363 we again have the location by -- in feet along the levee realignment, correct?

A That's correct.

Q And then column number two is the levee crest elevation that you surveyed, and that is the same number as found on column two of 1362, correct?

A That's correct.

Q And then what you have is the design elevation in column three, and that's the same as column three on 1362, correct?

A Yes.

Q And then the difference here on this exhibit, 1363, is that the fourth column is the flood elevation, and the fifth column is the difference between the height of the dike and the flood elevation, correct?

A That's correct.

Q All right. Now, you indicated that, in every instance, that the difference between the height of the dike and its design elevation was more than three feet higher than the water surface elevation during the 1990 flood; is that correct?

A That's correct.

Q So, if I understand your testimony, if there's six

inches of gravel or some new material on top of a -- of the dike, then that -- the top of that would be three feet six inches over the water surface elevation and it would never have come into play.

MR. HAGENS: Your Honor, again, this is extremely leading. I don't think counsel should be testifying.

THE COURT: That was leading. I agree.

Q Would you come down and draw for me, if you would, please, on this butcher paper, the concept that you've identified.

A Okay. What I'm going to draw is a cross section of a levee going into a river channel, so we're looking down

the river at a cross section of the levee. Low flows in a river would be right down here. As it goes higher it starts to go against the levee. This would be the design elevation of the levee.

In 1955 an engineer sat down and said this is how high the levee should be. What we're saying, then, is we surveyed it in 1993 and we found in some cases it was a little lower, in other cases it's a little bit higher. But then we compared how did this relate to the 1990 flood.

Q Blue for water.

A Actually, let me do a few things here. Here we have as much as 1.2 feet lower, as much as 1.5 feet higher, but if we compare the flood elevations in 1990, we find that the flood was always three feet lower than this design crest, so whether that levee was a couple inches higher or a foot higher or a couple of inches lower or a foot lower had no impact on this flood level that never got that high. That's what we found from comparing our

survey, it was meant to be built like that, how it exists today, and what the flood levels were. Never got that high. Never got to the low spots, never got to the high spots -- than three feet.

Q Would you label this document for me Difference Between Flood Elevation of Dike District 12 Levee and Design

Height.

MR. SMART: And I'd like to mark that, Your Honor, as Exhibit 1363A so that we can match it up with the document that it relates to.

THE COURT: All right.

A We call it difference --

Q Between flood elevation -- elevation and design height for Dike District 12.

Okay. Thank you.

MR. SMART: Offer 1363A, Your Honor.

MR. HAGENS: Your Honor, may I voir dire on the exhibit, Your Honor?

THE COURT: All right.

MR. HAGENS: This only deals with the elevations from the beginning of the 1955 levee realignment; isn't that correct?

THE WITNESS: That's correct.

MR. HAGENS: This doesn't undertake to talk about the difference between November 25, 1995, and Dike District 12's entire dikes, but just the dikes beginning north -- going north of the realignment?

THE WITNESS: That's correct.

MR. HAGENS: When he has Dike District 12, that isn't accurate. It's only a small portion.

THE WITNESS: Right. It would say 1955 dike

realignment.
MR. HAGENS: Your Honor, I think that this is --
MR. SMART: We'll add in --
MR. HAGENS: So this is an illustrative exhibit if he limits it to the realignment, because the realignment's only a small fraction of the entire dikes that he studied.
THE COURT: I'm sorry, you said so that makes it illustrative?
MR. HAGENS: I do think it's illustrative. He's not saying that this is a -- anything but a schematic of what is -- actual calculations depicted on the various exhibits, Your Honor.
MR. SMART: I don't think that means it shouldn't be admitted as part -- along with 1363.
THE COURT: Mr. Anderson?
MR. ANDERSON: No objection, Your Honor.
THE COURT: It will be admitted, then, in its present form, with the change having been made.
(Whereupon, Defendant's Exhibit No. 1363A was admitted into evidence.)
MR. SMART: Thank you, Your Honor.

Q All right. Now, Dr. Melone, did you also take a look at any rating curves with respect to the portion of the --

the portion of the river below the Burlington Northern Bridge in this area down in here?

A Yes.

Q Okay. And just to refresh the jury, what is a rating curve, sir?
A A rating curve is a relationship between the level of water in the river and the amount of flow in the river, so it's a graph that if you know the elevation of the water in the river, you can go to this graph and then determine what the flow in the river is. It's the standard procedure used by the U.S. Geological Survey to maintain a continuous record of flow. What they actually measure is water level and then they, based on this graph, they convert that to flow in the river.
Q Okay. Now, Dr. Mutter put into evidence a rating curve which I'll show you here, Exhibit 998. The jury's already seen this one, and the testimony at that time was that the rating -- that the points on the rating curve for the 1990, 1975 and 1951 floods all fell on the rating curve.
What does that mean with respect to the ability of the river to pass water down below the Burlington Northern Bridge during that time frame?
A That means at that location, given -- means the relationship between the flow -- the water level and the

flow is unchanged for a given water level, whether it was in '51 or '75 or '90, from this graph is unchanged, meaning there has been no changes that has affected that portion of the river to convey floods.
Q All right. Showing you Exhibit 1364, can you identify that document?
A It's a different plot that I prepared of the rating curve at the exact same USGS location.
Q Okay.
A This is just near the Riverside Bridge on the Skagit River.
Q Okay. Does the rating curve information that you have

on 1364 match the rating curve information that is found on Exhibit 998, Dr. Mutter's rating curve?

A Appears to be identical.

MR. SMART: Offer 1364, Your Honor.

MR. HAGENS: This was prepared in -- on April 2nd, or printed on April 2nd, 1997?

THE WITNESS: Yes, it was.

MR. HAGENS: And had this work been done earlier?

THE WITNESS: Yes, it was.

MR. HAGENS: You just didn't have the printout, is that what you're telling us? You didn't have the printout earlier?

THE WITNESS: It was printed out early. I

reprinted it here, whatever the date was here.

MR. HAGENS: What was the purpose of the reprint?

THE WITNESS: I have a better printer. Prints a tidier copy.

MR. HAGENS: Then we have no objections.

MR. ANDERSON: No objection, Your Honor.

THE COURT: All right. That will be admitted then.

(Whereupon, Defendant's Exhibit No. 1364 was admitted into evidence.)

Q Showing the jury the rating curve as plotted by yourself, Exhibit 1364. Again, I'm going to focus in on the floods of 1951, 1951 through 1990, and all of these floods fit exactly on the same rating curve; is that correct?

A That's correct.

Q And that, again, indicates what with respect to the ability of this river to pass water?

A Means nothing has changed at that location that's affected the relationship between flow and water level.

Q All right. Now, I'd also like to show you an exhibit

that was placed into evidence by the plaintiffs in this case. I'm going to have to find it. I thought it was

Exhibit 47, but it's not.
Actually it is. It's the last page of 47.
Showing you the last page of Exhibit 47, can you identify that as a survey of Dike District 17's levee below the bridge?

A That's correct. That prints a survey from the Riverside Bridge up to the Burlington Northern Bridge on the south side of the Skagit River.

Q And that would be in this location here; is that correct? Okay, this section here, Riverside Bridge here, Burlington Northern Bridge here, correct?

A That's correct.

Q And how many feet is that, approximately?

A Don't recall how many feet. I think it was --

Q How many feet are shown on the survey? Approximately 1,100?

A I don't see it listed on the survey. I don't recall. I thought it was 1,700.

Q Can you take it off the stations, 2,900 to --

A You're right, 1,100.

Q Now, the testimony from the plaintiffs in this case is that the portion of the dike in that location below the bridge on the Dike 17 side was filled through the 50-year water surface profile by a project that was done in July of 1990, and I'd like you to assume that for the

purpose of my question here, and that would be this distance between the actual survey profile, which is somewhat lumpy here, and this design 50-year profile or 25-year protection level that's measured by this portion in here. And my question to you, sir, is have you had an opportunity to take this exhibit and plot on it using the plaintiffs' models' results the water surface elevation that actually occurred in 1990?

A Yes, I have.

Q And is 1365 your plot of what their model says that the water surface elevations are --

A Yes, it is.

Q -- for the 1990 flood in comparison to the dike height both before and after this project that, according to the testimony, took place in July of 1990?

A Yes, it is.

MR. SMART: And I would offer then 1365, Your Honor.

MR. HAGENS: Wait a second. This hasn't been previously provided to us, has it, Mr. Melone?

THE WITNESS: No, I think in my opening comment, I think I said it was a recent analysis.

MR. SMART: You did this yesterday; is that right, sir?

THE WITNESS: Correct.

MR. HAGENS: Maybe I could just understand where the plot is in relation to everything you've done here. May I see the exhibit?

THE WITNESS: I think I'm about to tell you that.

MR. HAGENS: Tell me -- I don't want you to -- describe the numbers, I just want you to identify where on the chart it is.

THE WITNESS: I don't understand the question. The blue line is the water level. The blue line on that figure is the 19 -- November 25th, 1990, flood level.

MR. HAGENS: Using your model or Dr. Mutter's?
THE WITNESS: Using the plaintiffs' model.
MR. HAGENS: The plaintiffs being Dr. Mutter's demonstrative model?
THE WITNESS: Yes.
MR. HAGENS: Is there any estimation done in connection with 1365?
THE WITNESS: Any estimation of what?
MR. HAGENS: Any estimation done of where -- as you notice on the right-hand side of Exhibit 47, there is a vertical line showing the feet, right?
THE WITNESS: Correct.
MR. HAGENS: Is this an estimated foot relationship?

THE WITNESS: No, it is using the same scale that is on the figure, the same vertical scale you made reference to using that same scale.
MR. HAGENS: But this is an estimate on your behalf?
THE WITNESS: No, it's not an estimate, it's a measurement.
MR. HAGENS: Okay. I understand what you've done, and if I were to ask you for it, you could actually give me the number of feet in terms of flood elevation?
THE WITNESS: Yes.
MR. HAGENS: Against this portion of the levee; is that right?
THE WITNESS: That's true.
MR. SMART: I'm offering 1365, Your Honor.
MR. HAGENS: Your Honor, we haven't seen it. I recognize it's just a computation, so we're not going to object, Your Honor.
MR. ANDERSON: Can I see the actual exhibit? No objection, Your Honor.
THE COURT: All right. 1365 then is admitted.
(Whereupon, Defendant's Exhibit No. 1365 was admitted

into evidence.)

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Q (By Mr. Smart) All right. Let's put this on the screen.
Now, again, for the jury, this is the surveyed profile of the levee as it existed before the project in July of 1990; is that correct?
A Yes.
Q And this is a 50-year water surface profile or 25-year protection level line that is the design, if you will, for a project to bring this levee up to a particular grade; is that right?
A Yes.
Q So that assuming this project were built as represented by the plaintiffs, this section of levee here would be filled in to this level here; is that correct?
A That's correct.
Q Now, this blue line represents the water surface elevation according to their own model in the 1990 flood, is that what I understand your testimony to be?
A That is right.
Q And how far below the preexisting dike elevation is that water surface elevation?
MR. HAGENS: Below what elevation? I'm sorry.
MR. SMART: Below the preexisting dike elevation.
A It varies with location along that. The lowest, I believe, was about two feet below. In some cases

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greater, but maybe I would expand on what we're looking at here.

What we drew on the paper here was a profile looking up and down the river. On the drawing there is a cross section of the river as if you're standing and looking down. This figure is different. This is looking -- standing in the river and looking at the bank of the river. You're looking now at a levee from the side. You're not -- so as you look at this from the side, what we see on this drawing, the way the wavery line is what existed prior to the project. That's an elevation of the top of the levee prior to a project.

Q Right here?

A Correct.

Q Okay.

A Then I looked at, using the plaintiff's model, what was the flood elevation in 1990 and drew it in at the same scale. To give you a sense of the scale, if the greatest amount of fill -- can you -- straight up from where you're at --

Q Here --

A Right there. The greatest amount of fill there, that's about 1.8 feet, so if we go down from that point to the blue line, that's in the order of about 2.2 feet, to give you a scale here on the drawing.

Q Okay. So assuming that this dike was changed in July of 1990 from its existing elevation as shown by this bumpy line here on 1365 to this straight line, the 50-year water surface profile, in July of 1990, could that have had any effect on water surface elevations during the 1990 flood?

MR. HAGENS: Wait a second. I'm going to object to that without some foundational questions as to whether or not the dike was widened and strengthened so as to prevent failures. He's assuming all they do is

raise a dike and they can just raise it one for one, and I think even this witness will tell you you don't raise a levee one for one, it's two to one or three to one or something like that.

I'm going to object to that without a foundational question as to whether or not the levee had been altered in its property to withstand failure.

MR. SMART: The witness has already given his qualifications. He's testified that just raising a levee does not alter --

THE COURT: That has been his testimony. You can follow up on cross-examination on that point.

You may proceed.

Q Okay. My question then, sir, is, assuming that this portion of the dike were raised to this 50-year water

surface profile, could it have had any effect on the water surface elevations during the 1990 flood?

A Could not have had an effect on the elevations in the November, 1990, flood.

Q And why is that?

A Because the flood level never got to the elevation of even the pre-project height of the levee.

Q Okay.

A So adding to it didn't change levels. Very similar to the drawing that we have up.

Q So with respect to these two locations, this same phenomenon would be true?

A Yes.

Q All right, that any asserted change in the height of the dike would not have affected flood levels during the 1990 flood because the water just simply didn't get that high; is that correct?

MR. HAGENS: Wait a second, he's testifying again.

THE COURT: That's leading.

MR. SMART: I'm just trying to sum up and move on, Your Honor.

THE COURT: An objection's been lodged, and it

is leading.
Q All right. Would you describe then, sir, in summary

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form, the information that we've just gone over.
A In summary, for the two levees that we looked at, the north Dike 12 dike, the realignment of the dike district, Dike District 17, this is further downstream from Burlington Northern Bridge to Riverside, in both cases, the 1990 flood level did not get to a pre -- in this case, this case of Dike District 17 did not reach a pre-project level, so anything that was done to make it higher would not come into impacting the 1990 flood. Same as for the Dike District 12, dealing with two miles of realignment, that the flood levels did not reach that elevation, the design height elevation.
Q All right. Now, you indicated earlier this morning that, in your opinion, the log jams on the Burlington Northern Bridge were an impediment to the flow of water downstream; is that correct?
A Yes.
Q And do you have an opinion with respect to whether or not that impediment raised water surface elevations during the 1990 flood upstream from the Burlington Northern Bridge?
A Yes. As the Burlington Northern Bridge is a bottle neck in the river system by itself, it's a narrow opening for the river to pass through. It has 12 big concrete piers holding that bridge up. And, in addition, commonly for

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major flood events, a lot of log debris comes and jams up on that bridge, and as it jams up on the bridge, what the water has to do -- if you think of it in terms of a -- it takes the water more energy to get through this log jam and the pier, more energy than it would if the log jam wasn't there. So then how does the river get that energy? It gets that energy upstream from the bridge by backing up, backing up and getting higher. That's how it gets more energy, so that it can overcome the energy losses, the amount of energy it takes to get through the log jam and the bridge.

Q Okay. And have you calculated the amount of increased water surface elevation upstream from the Burlington Northern Bridge as a result of the log jams that occurred during the 1990 flood?

A My calculations showed --

MR. HAGENS: Wait, wait, wait, wait. I'm going to be object here. He needs some foundation. If he's talking about a log jam, I'd like on to know what the dimensions of the log jam are, how deep it is, how wide it is.

THE COURT: Sustained.

Q How did you calculate it, sir?

A We have a modeling effort. I mentioned that we created a two dimensional FESWMS, F-E-S-W-M-S. It is an acronym

for a model called the Finite Element Surface Water Modeling System. In creating this model, what a modeler must do is what we call calibration. Calibration means go out -- remember I said we surveyed 1990 flood elevations? A model, thus, to be calibrated, it must reproduce the 1990 flood elevations, and if it cannot do

that, then you say I do not have a calibrated model. We did the same with 1975 using information from the Corps of Engineers. We found, when we tried to calibrate our 1990 model in the vicinity of the bridge, upstream from the bridge we could not reproduce the observed flood levels that I surveyed with the bridge with just the 12 bridge piers, so what I did is made the area less. I lessened the area to account for more obstruction of the log debris, and I did that process. You put some -- you decrease the area to see if you reproduced your 1990 number. If I haven't, then that means I haven't blocked enough, so you block that area and make it smaller 'til you've reproduced the 1990 observed flood level.

Q Okay. And is that the standard practice in using the FESWMS computer model system for reproducing phenomena that affect certain flood levels?

A It's a standard procedure for all hydraulic models.

Q And what did you determine with respect to your efforts

in that regard concerning the water surface elevation caused by the log jam during the 1990 flood?

A I found that there was an increase in flood levels upstream from the Burlington Northern Bridge. It varied with distance from the bridge, but in the immediate vicinity, about seven inches in my opinion was attributable to the log jam itself. As we went further upstream it lessened to perhaps four or five inches throughout the lower Nookachamps valley.

Q Okay. Did you also make a comparison between the 1951 flood and the 1990 flood with respect to water surface elevations?

A Yes, I did.

Q Could you tell the jury what you did in that regard.

A I took the same -- our modeling of the 1990 flood, which, again, was calibrated to the observed flood levels. The Corps of Engineers, in the 1967 report, showed their analysis of the 1951 flood. I compared the

two. The 1951 flood had higher flood levels further upstream near Sedro Wooley, in that area. As we went downstream from Sedro Wooley they were actually higher than 1990, and as we got closer to the Burlington bridge they crossed and the flood levels were a little bit lower than 1990.

Q And is 1366 a comparison of the 1951 flood level

information that you observed from the Army Corps -- is it Army Corps or USGS?

A Corps of Engineers.

Q Army Corps and the observed flood levels in 1990?

A Yes.

MR. SMART: Offer 1366, Your Honor.

MR. HAGENS: When did you prepare this, Dr. Melone?

THE WITNESS: The exact date I don't know. Printed it probably in the last few weeks. The information I've had and been --

MR. HAGENS: It was turned over to us, I know, years ago. The 23.4, road mile 23.4, is it indicated on here someplace on this water surface elevation?

THE WITNESS: The access along here shows river mile 23 and 24, so 23.4 would be in between those two.

MR. HAGENS: But I'm just trying to understand the exhibit. 23.4 would be where then the Highway 9 bridge is located, is that --

THE WITNESS: Yes.

MR. HAGENS: And this is based on what data, did you say?

THE WITNESS: The 1951 data was extracted from the U.S. Army Corps of Engineers report.

MR. HAGENS: And the 1990 data came from where?

THE WITNESS: That is the modeling effort that I undertook.
MR. HAGENS: Model. Thank you.
No objection, Your Honor.
MR. ANDERSON: No objection, Your Honor.
THE COURT: All right. 1366 will enter.
(Whereupon, Defendant's Exhibit No. 1366 was admitted into evidence.)

Q (By Mr. Smart) All right. Now, showing the jury your graph of the results, can you identify -- actually maybe if you would come down here and, using the pen as a pointer, it would be easier for you to explain, and just tell me whether you need it to be bigger or smaller, and just using that as a pointer explain what you've plotted here.
A This is a figure, it's a graph. Along this axis is the water elevation. This is river mile. This is location along the river. At a point here we're at the lower end. This is about where the USGS gauge is, and we see the water get higher, not deeper, but working its way up the river, and we get to this point and we are about at the Highway 9 bridge near Sedro Wooley. So then what we did --
Q Just for clarification then, that's going from the

Burlington Northern Bridge here up here to the Highway 9

bridge, which is just about where my finger is; is that correct?

A That's correct.

Q So it's that section of the river?

A Correct. And the comparison that I made, the dark solid line is what the U.S. Army Corps of Engineers said the flood profile was in 1951. The 1990 line, which is the squares and the dashed line came out of the hydraulic modeling that I did, another set of elevations and flood profile, so this is just a comparison of water levels. What it means is, for example, just arbitrarily here, picking out a spot at mile 20, we would see in 1990, higher than 1951. In -- or at the Highway 9 bridge we would see the Corps of Engineers with a higher flood level than what I calculated for 1990.

Q Now, there has been testimony in this case by Mr. Ken Johnson who owns a farm that's located, oh, right in the middle of the Nookachamps, but it's right approximately here, and I can point it out on a -- Mr. Johnson's farm is in this location right in this area here. Does your -- and the testimony was that the water surface elevations for the 1951 flood and the 1990 flood were exactly three and a half inches different.

Would you agree that, based on your graphing of

the 1990 and 1951 floods, that the water surface elevations were very close at the Johnson farm?

A Yes.

Q And that point is shown -- you've got the Johnson river mile at 21.7, and that is in approximately this location here?

A Yes.

Q Is that correct?

A That's correct.

Q So if you translate up to the graph, and it's a little bit difficult to show, it's just near where you have this black dot here?
A That's correct.
Q So based on the modeling that you did and the results, the information that you have received from the Army Corps with regard to elevations, you would -- would you be in a position to verify the testimony of Mr. Johnson that the water surface elevations were very similar?
A That confirms that, yes.
Q All right. Now, let's move on to your next opinion, which is that all topographic and physical features from the Burlington Northern Bridge upstream have an effect on water surface elevation. Could you explain that to the jury and how you came to that conclusion.
A I think we've commented a few times today, there are a

number of man-made structures and natural topographic features in the Skagit Valley. We've mentioned the Burlington Northern, their railroad, their embankment. We've mentioned the bridge, the bridge piers, the 12 big concrete bridge piers. We've mentioned the railroad that parallels SR 20 built up there, Dike District 12 and their levee, Dike District 17 and their levee.
If we go upstream, we have, again, major significant flood control reservoirs. We've got Puget Power's Ross Lake, we've got -- or Seattle Light's Ross Lake, Puget Power's Baker Lake. All of these structures collectively and cumulatively affect water surface elevations. Some of them might raise a flood level, some might lower a flood level, but collectively there is a network of civil works that construction began on in the 1800s of putting civil works in the valley, in the upper basin, that have carried on since then collectively and cumulatively affect flood levels on the Skagit River.
Q Now, you have brought with you here today photographs of

the dams and the flood control reservoirs at Baker lake and Ross Lake, have you not?
A Yes, I have.
Q Would you identify Exhibits 1367 through 1370 and just say for the record what each one is. You'll have to

look at the back. Don't show them to the jury yet, but look at the back, identify the number and say what it is, please.
A 1370 is a photograph of the Upper Baker Dam. 1367 is a photograph of Baker lake. 1368 is a photograph of Ross Lake. 1369 is a photograph of Ross Dam.
Q Okay. And you're familiar with these structures, are you not?
A Yes, I am.
Q And these photographs are true and accurate depictions of these dams and lakes that they depict, are they not?
A Yes, they are.
MR. SMART: Offer 1367 to 1370.
MR. HAGENS: When were these taken, Mr. Melone?
THE WITNESS: The photograph of Ross Lake was take in 1971. The photograph of each of the dams was taken at the time of construction, shortly after construction, and I do not know the year of the Baker Lake photograph.
MR. HAGENS: You didn't take these pictures, obviously; is that right?
THE WITNESS: I did not take these photographs.
MR. HAGENS: You didn't see these things, did you?
THE WITNESS: Yes, I have.

MR. HAGENS: At the time that they were --
THE WITNESS: At the time of the photograph, no. I wasn't there at the time of the photograph.
MR. HAGENS: Well, Your Honor, we have no objection to these. I understand why they're being offered, so we're not going to make any objection to them.
THE COURT: All right.
MR. ANDERSON: No objection, Your Honor.
THE COURT: All right. They'll be admitted then.

(Whereupon, Defendant's Exhibit No. 1367, 1368, 1369 and 1370 were into evidence.)

MR. SMART: Thank you Your Honor.

Q Now, would you just come down here while I hold them, and perhaps explain to the jury which they are and describe where they're located and what their purpose is.

A In the upper valley of the Skagit River there are two very major flood control reservoirs. Each one has a very large dam. Behind the dam is a very large reservoir. They're operated for power. They're also operated significantly for flood control. This one is one of them on Baker River, tributary to the Skagit

River, one large dam. It's a photo taken shortly after construction. We see what the reservoir looks like, and the amount of water that is in the reservoir is storage for flood control that is available in the reservoir.

Q You're talking now about 1367?

A 1370 and 1367.

Q All right.

A Similarly, 1369 and 1368, we have again a very large dam, Ross Dam, the upper Skagit River. Behind the Ross

Dam, again, a very large hydropower project and flood control project in the mountainous areas, the head waters of the Skagit River that are operated for flood control. They operate for flood control. When the flow of the river gets to be about 90,000 cfs -- it doesn't have to get very high before they start operating for flood control. 1990 peaked at 152,000. When that flow got to 90,000, or any flow, 1990 or any other year, they begin operating these dams for flood control to reduce the flood level and flow downstream.

Q And in the 1990 flood did these dams and storage reservoirs operate to reduce flood levels in the Nookachamps area?

A Yes, they did.

Q And has the Army Corps reported on that situation and identified how much they operated to reduce flood levels

during the 1990 flood?

A Yes. In my review of Army Corps of Engineers --

MR. HAGENS: Wait a second. I object. I don't think he should be entitled to repeat hearsay. If he's done his own study, formed his own opinion, that's one thing, relying on other people's testimony, but I don't think he should be allowed to regurgitate what somebody else wrote.

MR. SMART: It's a historical. Plaintiffs' experts have testified, as have others, with respect to the effect -- in fact, we have an exhibit that was put into evidence by plaintiffs, Exhibit 145, that is the Army Corps report in question. I don't see why Dr. Melone can't refer --

MR. HAGENS: I'm objecting because he's not saying what his opinion is, he's just regurgitating what somebody else's opinion is.

MR. SMART: Mr. Hagens has asked, throughout

this trial, do you have any reason to dispute this information. You know, it's clearly appropriate information for a hydraulic engineer, an expert on flood control.

THE COURT: I'm not sure, is it something that he's relied upon in the course of his -- of your analysis of this case, Dr. Melone, have you relied on

that report or referenced it? You haven't prior to this?

THE WITNESS: I have read it. Part of my review of what I did in preparing for this trial was review Corps of Engineers reports.

THE COURT: Have you actually read that document?

THE WITNESS: Yes, I have.

THE COURT: All right. You may proceed.

Q (By Mr. Smart) Okay. Again, referring to Exhibit No. 145, and if you'll turn to page 15, does that document indicate what the determination was with respect to the amount of savings in terms of flood elevations at Mount Vernon for the November 25th, 1990 flood, if you look at subparagraph d.

A Yes. The Corps of Engineers, through their analysis, and it's the Corps of Engineers who works with the power companies in the operation of the dams, their estimate for the November 25th, 1990, flood was that the amount of water they held back in these large reservoirs, they made a difference at Mount Vernon of four and a half feet in flood elevation. That is what the Corps of Engineers, again, through their analysis, and their analysis of how much water they held back during the November 25th flood, the result was a flood level being lower at Mount Vernon, by their analysis, of four and a

half feet.
Q All right. Now, the flow that was predicted by the Army Corps of Engineers that would have occurred had there not been the storage in the storage reservoirs was what amount?
A 180,000 cfs.
Q All right. And 180,000 cfs correlates to what historical flood?
A 1906.
Q All right. And you have studied the 1906 flood as part of your review of documents and analysis of the river, have you not?
A Yes, I have.
Q All right. And have you -- before I get there --
THE COURT: Before you get there, why don't we take about a five minute stretch break. I'm seeing the same look I'm feeling on a couple of faces, so why don't we do that. Go ahead to the jury room if you like, or walk around. We'll make it five minutes.
(Recess was taken.)
(Whereupon, the following occurred in the presence of the jury:)
THE COURT: Be seated, please.

CONTINUED DIRECT EXAMINATION
BY MR. SMART:
Q Just a couple more questions, Dr. Melone, with respect to this upriver storage and then we'll move on.

In your estimation, have the dams at Ross and Baker Lake provided flood storage benefits to all the residents downstream from those dams?

A Yes. We just saw cited the 1990 example, but I think it's interesting to look at just the list of historical floods. Our 1990 flood is certainly the largest that's occurred since Ross Lake went into -- was built in 1940, but if we also look when are all our largest floods on record, I don't think we have exceeded the 1990 flood until 1921.

Q And was 1921 before the upriver storage dams went into effect?

A Yes. So the large floods from 1921 and forward all occurred before the upriver large flood control reservoirs were constructed.

Q Okay. And, again, the Army Corps report equates the 1990 flood without the storage to the 1906 flood of 180,000 cubic feet per second, correct?

A That's their estimate of what the flood would be in 1990 without the storage.

Q Okay. Now, let's move on to some other opinions. Your

next one was what, sir? Your next opinion? I think we've gotten to the point where you've just finished talking about the topographical features that were --

A Yes. The next opinion that I had dealt with, it's actually very similar to opinion one, that is simply that the flood waters that go into the Nookachamps Creek as the Skagit River overtops its bank, that these flood levels relate to the Skagit River flood level. We showed earlier the black and white air photos and for how, from 1915, water entered into this area, and there's certainly a relationship. The bigger the flood on the Skagit River, once it goes over bank, the Nookachamps Creek area just rises right along with it, and it starts to flood in that depressional area I estimated somewhere around 65,000 cfs is when we start

to go over bank in the lowest areas and start to back up into the Nookachamps Creek area, so there is -- certainly the relationship between flood levels.

The bigger the flood on the Skagit River, the higher the flood levels will be in the Nookachamps Creek area.

Q And what climatic conditions cause these bigger floods?

A Certainly in a big river like the Skagit River and our Pacific Northwest climate, we have our floods occurring in the November winter time, November through the

winter. Combination. We have large amounts of rainfall, warm rainfall. I guess we, on the news, are referred to as pineapple express, very warm water, large precipitation events, and then we have, because of our Mountainous terrain, considerable amount of snow pack in the upper mountains, so extreme flood throughout the northwest, not just on the Skagit River, is a large rainfall event supplemented by a large amount of snow melt due to the warm temperatures and the large amount of rain.

Q All right. Your next opinion was what, sir?

A Had to do with Fir Island. I guess -- I've been involved, I've heard a lot about Fir Island. It's a levee failure that occurred many miles downstream from our site. I guess the question that at one point was asked, did Fir Island affect our area upstream from the Burlington Northern bridge, and our answer --

MR. HAGENS: Wait a minute. I want to know if he did any study or work to determine that.

THE COURT: It's a foundation objection. Sustained.

MR. SMART: Your Honor, the opinion is already in. It's been testified to this morning.

THE COURT: The opinion is in, but I thought he was going to --

MR. HAGENS: I'm going to object. He can summarize his opinion and we'll get around to finding out if he's got a supportable opinion, and I'm entitled to object. Let's see the foundation for this. I think he has to lay some foundation for this opinion, and maybe, if it doesn't fly, we can go back and ask that it be stricken, because every expert is entitled to give a summary overview and then to get up and give an individual opinion.

MR. SMART: I've already laid the foundation as to what he did, but I'm happy to go through it again.

Q Dr. Melone, what was it that you did, sir, in order to evaluate whether or not the break at Fir Island had any effect on flood levels in the Nookachamps?

A I did two things. One we spoke of earlier. Remember the rating curve at the USGS gauge, that is the relationship between water level and flow going by the USGS gauge. If something happened somewhere else on the river to change that relationship, then that flow measurement that plotted right on the curve, it would not have plotted on that rating curve. It would have told us that something has happened to change this rating curve because our flow doesn't plot on it any longer.

The graph that I showed and Dr. Mutter showed,

the 1990 flow measurement plotted exactly on the existing rating curve. That tells me that nothing has occurred on the river that has affected that

relationship at the USGS gauge.
Q Would that be true of places other than Fir Island? For instance, if there was something closer to the USGS gauge that affected water surface elevations, would you expect that to show up on a rating curve and change those plotted points?
A If anything happened downstream from the USGS gauge that affected flood levels at the gauge, it would have showed up in the rating curve.
Q Okay.
A That's one of the two things I looked at.
The second one was simply to look at the recording that was made by the USGS as the flood went by that gauge. In my opinion, if something happened, if there was a levee failure, something quickly happened, I would expect to see it on the recording of the USGS trace. Remember, I told you on the rating curve they report water level in the river, so if something had happened, I would expect on that recording to see a little break in the record or a fluctuation. I would expect to see some anomaly in that trace, and, in looking at the recorded trace at this USGS, I did not

observe that.
Q Okay. First of all, here's 1364, which is your rating curve, and here is the 1990 point and that, again, is right on the rating curve established by the previous floods, correct?
A Yes.
Q And if something had happened downstream from the USGS gauge in order to change the amount of water that was passed by the system and/or affect flood levels, would you have expected the 1990 point to be at a different location than right on the curve?
A Yes, it would not have plotted on that rating curve.
Q Now, you also mentioned the trace of the USGS trace of the flood; is that correct?
A Yes.

Q Showing you Exhibit 1371, is that the trace of the 1990 flood?
A Yes.
Q And have you marked on 1364 the time at which the Fir Island dike breached?
A Yes.
Q And is page one of the trace -- is time on the horizontal axis and elevation, flood height elevation at the gauge on the vertical axis, and page two is time on the horizontal axis and flood flow on the vertical axis;

is that correct?
A That's correct.
MR. SMART: Offer 1371, Your Honor.
THE COURT: Counsel?
MR. HAGENS: What's the second page of 1371?
THE WITNESS: The first page is a plot of the water level. The second plot is of the flow in the river.
MR. HAGENS: By the way, these show -- have been printed 4-4-97; is that correct?
THE WITNESS: That's correct.
MR. HAGENS: This is not something you had available for the deposition?
THE WITNESS: Yes, I had it for the deposition.
MR. HAGENS: You had the data but not the chart?
THE WITNESS: The chart was in my files.
MR. HAGENS: On the stage feet of the river, is there a relationship -- does the chart depict a relationship between the amount of water coming down the river, that is if the water level -- if the water level as depicted in this exhibit were to go up because the flow increased, would that be related in this exhibit?
THE WITNESS: Yes, that's what it is, it's a record of the increasing water level.

MR. HAGENS: No objections, Your Honor.

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MR. ANDERSON: No objection, Your Honor.
THE COURT: All right, 13 -- and the number?
MR. SMART: 1371, Your Honor.
THE COURT: Great. Thank you.
(Whereupon, Defendant's Exhibit No. 1371 was admitted into evidence.)

Q (By Mr. Smart) For the jury then, this chart shows November 25, 1990, stage and, again, although we've described it not so that they could see, on this axis is the flood height called stage; is that correct?
A That's correct. As I mentioned, what the USGS records is water level, so this is the recording of the water level at the gauge.
Q And on the horizontal axis is time in hours; is that correct?
A Yes.
Q And each of these increments is a four-hour period; is that right?
A Yes, it is.
Q So -- and you have marked the eleven a.m. approximately, Fir Island on November 24th, the Fir Island dike break; is that correct?
A Yes.
Q And then for the next -- let's see -- 5, 9, 13, 17, 21,

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maybe 22 to -- the next 22 or so hours, is it correct that the water surface elevation continued to rise?

A That's correct, yes, it did.
Q And so what would you expect to see if the Fir Island dike breach had affected water surface elevations?
A If there was a breach or anything else that affected flood levels right where I drew this, or anywhere on this curve, I would expect to see a break. Again, I would say if something happened, I would expect, if something happened that caused water levels to go down, I'd expect to see a drop, or a rise, or just a change in the slope of this curve, some anomaly that tells me something happened for a little while here that caused things to change.

This is a very smooth curve, in my opinion, tells me, combined with the information we got out of the rating curve, that nothing downstream propagated up to this gauge.
Q And the dike break was down in this area here?
A I don't know the exact location of the Fir Island break.
Q But the gauge is in this neighborhood here, correct?
A Yes.
Q And, in fact, this rating curve shows us that nothing that happened downstream has affected water surface elevations at the gauge, correct?

MR. HAGENS: Wait a second. That's, again, a leading question, Your Honor.
A I've already stated that.
MR. HAGENS: May I have my objection ruled on, Your Honor?
THE COURT: Yes. All right, it was leading.
Q Okay. With respect to the location of any affect of what -- describe for the jury, if you would, please, what the lack of change in the rating curve demonstrates.
A I was just trying to restate what I believe I already stated. Nothing downstream occurred that affected the flood level at the USGS gauge on the Riverside Bridge.
Q And if it didn't affect the flood level at the USGS gauge, could it have affected flood levels in the Nookachamps?
A It could not have affected flood levels in the

Nookachamps.
Q Now, the second page is the same information, is it not, simply plotted against time against flow on the vertical axis as opposed to water surface elevation?
A That's correct. Again, that's the whole purpose of a rating curve. The USGS records the water level in the river. They use that rating curve to translate or convert it to flow, and then this is the plot of the

flow.
Q And, again, same with the previous graph, if there had been something downstream you would have expected to see a break somewhere in this curve?
A Yes, I would. In my opinion, I would expect to see some indication.
Q Okay. Your next opinion was what, sir?
A Opinion number six we actually covered as part of probably opinion three. Had to do with the hydraulic model that I prepared for this study area and how I used it, and one of the things, one of the analyses that I did with the hydraulic model, as I spoke of earlier, was to focus in on this debris blockage at the bridge just to see if that was another one of the contributing factors to flood levels. As we've said already a few times today, there's many entities cumulatively and collectively all contributing to affecting water in some way. My goal was to say is the debris just one more of those pieces, and I think we explained that earlier.
Q All right. Now, part of opinion number six was that there have been larger floods in the Nookachamps prior to the 1990 flood, and we were talking about that before lunch with respect to Exhibit 1332 and the surveyed elevations of the water surface shown in that photograph. Now, Exhibit 1332 is a photograph from

1909, correct?
A Yes, it is.
Q And the 1909 flood had a flow of 220,000 cubic feet per second, correct?
A That's correct.
Q Did you investigate the water surface elevation that would have been caused by the 1909 flood in the Sedro Wooley area?
A Yes, I did.
Q And how did you do that?
A Okay. The pieces of information here, the water level at Sedro Wooley for that flood of 1909 was about 47.6 feet.
Q Where did you get that figure from?
A That was a published value from the USGS.
Q All right. And how did you use that in order to evaluate flood levels downstream from Sedro Wooley?
A With this property, a house in Clear Lake or a building in Clear Lake that existed in 1909, the question that I was answering was simply was that a higher flood level than 1990. The various things that I did for this particular building, it was not under water in 1990. In this photograph there is water surrounding the building, so on that basis alone we have the 1909 flood being higher.

I sent a surveyor out to the building and, through the survey information, calculated as best I could on this photograph a flood elevation of about 43 feet. That's really the first thing I did, so that being higher, certainly, higher than 1990. Then I asked

myself, not the best photograph, is there any other supporting information to this. That's when I went to the USGS gauge, where they have 47.6 at their gauge, which certainly correlates to this flood elevation, correlates in that my opinion is that that 47 was about a foot and a half of what we would see at this location, so my opinion is that this photograph is, one, higher than 1990, two, probably not even at the peak of the 1909 flood. The best I've been able to estimate is about elevation 43. I believe it was probably even higher than that during the peak of the flood.

Q Okay. And how much higher did you estimate that the peak of the flood was at this location in 1909?

MR. HAGENS: Well, wait a second. What would be the basis for this? Is this more estimation and guesstimate on his part? I want some foundation here how he's doing this estimate. I can understand him using the 47 feet.

THE COURT: I think he's being asked to extrapolate back from that given number in one location

to another, which is an area he's surveyed.

MR. SMART: We talked about several --

THE COURT: That's fine. You may proceed. Overruled. You may proceed.

Q Okay. Your estimation of the 1909 flood levels in the location of this photograph at the peak would be approximately what?

A I think it could be two feet higher than that photograph.

Q Okay. Now, is there a certain measure of variability or margin of error in any of these estimates of historical flood levels, yours, the plaintiffs' expert Dr. Mutter?

A There's always uncertainty in the measurement or the observation of a flood level.

Q And do you find that measurement of uncertainty even in recorded flood levels by witnesses, for instance, who

are measuring things against their barn, that sort of thing?
A There is always some level of uncertainty for many reasons. Did you mark -- were you there during the time of the highest flood level to mark it or did you get there before or after. If you got there before or after, was there evidence on a building that you could mark definitively that's the mark. Access, did you mark it as it was occurring or did you come back three days later and do it from memory, or did you do it based on

debris from a fence line, which would be plus or minus six inches.
Q And the margin of error that you use to measure accuracy would be how much, Dr. Melone?
A I would think plus or minus six inches.
Q And if your estimates or if the predictions that you make or any hydraulic engineer makes with respect to flood levels either past or future is within six inches one way or another, would you find that to be acceptably accurate?
A Yes, I would.
Q Now, your next opinion is what, sir?
A Again, more work with the hydraulic model. Say a few words about it, hydraulic model that was put together that represents flow patterns in the valley. We do that by entering into the model enough information to reproduce the value. By that we mean entering topography, entering ground elevations really, entering ground elevations into the model. We enter in roughness, how much resistance is there to the flow. A forest is going to have more resistance than a plowable form field. You vary what the roughnesses are, and then the third piece of information goes in how big is the flood, so the model effectively says to itself I have

this much water coming down, the land looks like this,

has some shape and it has forest and cleared area and channel and I'm going to flow through that, how deep is the water, and the model will come back and tell us how deep the water is, so we just created the model for the area as it existed in 1990 and did a modeling event and just generalized some numbers. Again, in the upper Nookachamps, if we took some of the lowest depressional areas, got as much as 12 feet of water. The Nookachamps, the lower Nookachamps Creek that we talked about so much as being a big depressional area, flood depths up to 22 feet of water.

Q This is in 1990?

A In 1990.

Q Did you then perform a comparison between the flood depth elevation and/or depth that was experienced on the plaintiffs' properties in 1990 and flood elevations and depths that occurred in previous floods?

A Yes, I did. Using the exact information that you saw earlier on the black and white air photographs where we showed what area was under water, I had to do an analysis. In order to determine what's under water, I had to do an analysis to say how deep the water is, so what I subsequently did, using that exact same information from those black and white air photographs, combined it with the 19 modeling results and made a

number of tables.
Again, in my opening statement I mentioned the data we collected to prepare some graphics and tables. I prepared a number of tables that just shows the variation in flood levels for all these floods that we've been talking about from 1815.
Q And how did you get the flood -- how did you take the flood elevation numbers that -- for instance, for the 1815 flood that you earlier identified was determined by the Army Corps, and translate that to the plaintiffs' properties?
A Okay. Each of the floods that we have on record that the USGS has published with that flood elevation the USGS publishes a flood level, so for each of those floods I had a flood elevation from the published USGS record and, with that, in some cases I had a published number both at Mount Vernon and Sedro Wooley, so we know the gradient from recorded. In other cases I had it at one of the locations and then used the gradient of the river to estimate the water level at other locations.
Q Okay. And have you then taken the topographical information from the survey that you had on Exhibit 1359 and used that to compute the actual depth of water on the plaintiffs' properties for various floods?
A Yes, I have.

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Q And can you tell me if Exhibit 1372 shows that information in tabular form for a number of the plaintiffs' properties?
A Yes, it does.
MR. SMART: Offer 1372, Your Honor.
MR. HAGENS: How did you use the maps you said you had, the overhead maps, or what do you call them?
THE WITNESS: I said I used the same information that went into making the maps.
MR. HAGENS: I just want to make sure we're on the same page about maps. What do you mean by --
THE WITNESS: I said I used the same

information that I used in preparing the graphics or the aerial photographs we showed this morning of the areas of inundation, the same data from the USGS was used to tabulate that information.

Q And then is it correct that you basically did a mathematical calculation to subtract the actual elevations that were surveyed from the actual?

A Yes. What we have, again, from the historical record is an elevation. Elevation doesn't tell us depth of water, elevation just tells us how high the water is.

Another presentation, not different numbers but just another presentation of that same information is to take that -- take the water level, compare it to the

ground elevation, subtract the water level from the ground elevation and we have a depth, so it's not a different set of data, it's just one case we present it as an elevation. In another case we combine, we throw in the ground elevation, subtract one from the other and we have a depth.

MR. HAGENS: You're not saying you gave this to us before today, are you, Mr. Melone?

THE WITNESS: You have seen that data --

MR. HAGENS: I'm talking about this particular map. I don't want to be told you've given me some 2,500 --

THE WITNESS: The question is, have you seen that graphic previously?

MR. HAGENS: Yes, that is the question.

THE WITNESS: I do not believe that you have seen that graphic previously.

MR. HAGENS: Then the question would be the data on the graphic, whether or not we have -- are you going to tell me what we've been provided this in both data

form in some kind or another? Is that what you're going to tell me?

THE WITNESS: No, I'm not going to tell you that.

MR. HAGENS: When was this computation

deprived?

THE WITNESS: This is the information we've been discussing on the black and white air photos for about three years now.

MR. HAGENS: In connection with that, on your deposition on December 4th, 1995, you were asked this question. This map gives area that was flooded. It does not give depth of flooding, correct?

THE WITNESS: That is absolutely correct, for the black and white graphic that we presented earlier showed area -- I think I was very clear in explaining that. It showed area of inundation. There is nothing on that black and white photograph that presents depth.

MR. HAGENS: The thing that allowed you to put this exhibit together was you had done the elevation shootings in late '96 that then gave you the ability to do this kind of work; isn't that right?

THE WITNESS: That's true. In part we have had from the beginning of the project and the formulation of my model and the formulation of the plaintiffs' model topographic mapping that gave us the elevations that we have had for some time now. The only thing that you're referring to is some refinement of a few spots there through an actual survey in the field.

MR. SMART: But the only thing that this 1372 is

designed to depict is the mathematical subtraction of the water surface elevation for a particular year -- excuse me, I got it backwards, the subtraction of the actual topographic height above sea level of a particular place from the water surface elevation for a previous flood, correct?

THE WITNESS: That's correct.

MR. HAGENS: This map doesn't undertake to tell the jury anything about what amount of flooding is caused by the levees, does it, just talks total flooding, isn't that right?

THE WITNESS: That graphic I think is quite clear at various locations what the depth of flooding is or was for a number of years through history. That is what's meant and that's exactly what it presents.

MR. HAGENS: I understand. Now try to answer my question. This map doesn't tell the jury the amount of flooding if any caused by the levees during the various events you depicted for each property here; isn't that right?

THE WITNESS: The question -- I'm sorry -- isn't sinking in here. The graphic is a graphic of depths. Has nothing to do with levees. Has absolutely nothing to do with levees.

MR. HAGENS: Just total flooding; isn't that

right?

THE WITNESS: I don't understand total" flooding."

MR. HAGENS: Total water depth as opposed to something -- as to trying to allocate that depth amongst what's caused by the levees.

THE WITNESS: Of course it's a depth of

flooding. There is absolutely nothing on there that refers to levees. It is exactly what it's presented to be, depths of flooding for various floods for -- in the historical record.

MR. HAGENS: Your Honor, we were not provided this exhibit. In fact, I might like a little opportunity to cross-examine the witness a little bit further in the absence of the jury if I had a moment to do so, Your Honor, as well as raise another objection, because I do think it's somewhat misleading. If it doesn't tell us what amount of flooding is caused by the levees, I'm hard pressed to understand what the relevance is except to create smoke and mirrors that these people have always flooded, without telling them why they flooded, which is what this lawsuit is about. It's grossing misleading to get into something that shows total flooding without being any effort whatsoever to allocate or determine what amount of flooding is

caused by the levees and what portion is not caused by the levees.

THE COURT: Counsel?

MR. SMART: Just because Mr. Hagens has a different view of this case and what is or isn't important doesn't bear on the relevance of this document, which is simply a mathematical calculation from other evidence, exactly the same as Mr. Mutter did and Mr. Regan before him with respect to making calculations up here in front of the jury.

MR. HAGENS: Your Honor, Mr. Mutter, unlike this witness, spent great hours and time determining what the amount of flooding was caused by the levees. This doesn't deal with that question at all. It lumps it all together and says, look it, these people were flooded ex-number of feet during these various events. That's not what this witness has done, Your Honor, and that's

why I think it's grossly misleading to get into something like this with making no effort to distinguish -- without making any effort at all to distinguish how much of this flooding was caused by the levees and how much of it was not caused by the levees, which is what the lawsuit has been about since the get-go.

MR. SMART: Just because Mr. Hagens says that's

what the lawsuit is about doesn't mean we agree. Your Honor will instruct on what the law and the jury will decide the facts. And, of course, as is shown by this document, some of these floods, like 1815 and 1856 floods occurred way before there were any levees, so Mr. Hagens point is something that he can argue, but it has nothing to do with whether or not this is an admissible document.

THE COURT: Counsel?

MR. ANDERSON: No objection, Your Honor.

THE COURT: I agree. It goes to the weight of it, not the admissibility. Mr. Hagens can follow up on those questions in cross-examination, but it's admissible for whatever value the jury wants to assign to it. And that's 1372; is that correct?

MR. SMART: That's correct, Your Honor.

THE COURT: All right.

(Whereupon, Defendant's Exhibit No. 1372 was admitted into evidence.)

Q This is going to be a little hard to see, so what I'm going to do is have you step down here, and I have a copy of this that I can put up on the screen for various properties. Why don't we pick a couple of properties so

you can identify for the jury what is depicted in 1372.

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DIRECT - MELONE (County)

Let's take, for instance, let's take the Hershaw property, which is located here, and you've got a chart here about -- with three different columns. First of all, I want you to explain what the columns are, and I will put this on the screen so the jury can see it better while we do this.

A We go back to the black and white graphics that we showed this morning for a number of floods, 400,000 cfs, 300,000, the point being there have been some larger -- with the larger floods there have been greater depths. This ties into this earlier graphic. It ties into it that it's going to provide you an overview, a feel for what those depth changes are. It's not to be any more or any less than that, a feel for what kind of depths are we talking about here when we talked about 400,000 cfs.

Q Okay. Let's talk about the Hershaw property.

A The Hershaw property here. Another thing I mentioned earlier, this depressional area here, if you live, for example, at the Hershaw property, what I have, the same years of flooding that we looked at earlier.

Q What are they?

A 1815, 1856, 1906, 1951 and 1990. The last column is, again, when I said the elevation, doesn't tell us

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DIRECT - MELONE (County)

how deep it is, just tells us how high the water is, and we get that from the historical record. Tells us how high the water is, not numbers I made

up, numbers that came from the USGS.
Then we talk about the ground elevation, simple
calculation here to create the third column or the middle column. We took this water surface elevation, we took a ground elevation, subtracted one from the other and we get a depth.
Q And the ground elevation that you subtracted is the one
that was surveyed here as shown on Exhibit 1359; is that correct?
A That's correct.
Q And so as an example, for instance, at the Hershaw property, what would the depth of water there have been in 1990?
MR. HAGENS: Same relevance objection, Your Honor. Same relevance objection. The question is what depth of the water was caused by the levees, Your Honor.
THE COURT: I understand what you're saying. Overruled.
A In 1990, for this reference elevation, the depth of water, I'm rounding here to the nearest foot. Remember a few minutes ago we talked about

accuracy? For this table I rounded everything to the nearest foot. About three feet is about how deep the water was at this particular point on that property in 1990. Pretty high ground, about three feet deep.
Q In 1951?
A '51, four feet.
Q And 1906?
A 1906 here we're up to five feet.
Q And in 1856?
A 1856, again, these big floods we had before the flood control reservoirs, we're up to eleven feet of water.
Q And in 1815?
A 1815, largest flood we have on record, we're up to 14 feet of water, or about 11 feet more historically has occurred at that location.
Q All right. Let's take another example, if we could. I
don't want to take -- let's say, for instance --

let's take one down here by Barney Lake, this location of Mr. Lundvall's property. Do you want to do this one here? Mr. Lundvall's property, which is all of this gold shaded property in this area. Let me find that on mine. Okay.
Okay. For Lundvall, in this location here, in

1990, the depth would have been what?
A 1990, about 16 feet here in 1990. But, again, this is a big depressional area. We've now gone over the high ground. We're going into the Nookachamps area. Happens to be in a low area. He's got 16 feet of water.
Q And in 1951 how much?
A '51, about the same, rounded off to the nearest foot.
Q 14 feet -- 16 feet rather?
A Sixteen.
Q And does that match up with the observed levels testified to by Mr. Johnson not far away from this property that he had three and a half inches difference between 1951 and 1990?
A It appears to support that.
Q And in 1906 what was the depth at the Lundvall location in that location?
A Up about three feet higher, to 19 feet.
Q 1856?
A Again, remember, we're getting into the big historical floods, jumping up to 24 feet.
Q 1815?
A Up to 28 feet is what we see here. You may not have noticed this. The difference say between '90 and 1815 is about eleven feet at both locations. Here

we've got 3 versus 14, here we've got 16 versus 27,

so the difference is the same but your depths of water are affected by your ground elevation. If you're down in a hole or depression you're going to have deeper floods than someone who is up on higher ground.

Q I'm not going to go through anymore with the jury, I'm sure that they can read the chart, but basically does the same relationship carry through, approximately eleven feet of difference between 1990 and 1815?

MR. HAGENS: Wait, wait, wait. At what location?

MR. SMART: At all locations.

MR. HAGENS: Eleven feet at all locations in Skagit County?

MR. SMART: Approximately at all locations shown on the map.

THE COURT: That appears to be the property.

Q Is the relationship approximately the same?

A It's approximately true for the points that we have shown on this graphic.

Q All right. Now, your next opinion is strengthening the levees does not result in higher flood levels; is that correct?

A Yes, it is.

Q Could you explain that concept to the jury. I know we've been over a little bit, but why don't you --

A Okay. Couple things about strengthening. What affects flood levels is really the question we need to ask ourselves. If you have a higher levee and the flood levels get up that high, you perhaps have done something that has affected flood levels, but if you do not change the elevation, if you do not change the height of a levee, then it cannot change the elevation of a flood. The flood doesn't know what the levees made of. All the flood knows is how high it is. That's all the flood -- that's all the water molecule knows is how high it is, so you do not -- strengthening of the levees does not result in higher flood levels.

Q Does the amount of water on a level, in other words in elevation, is there a correlation between how high

the levee -- is there a correlation between how high the water gets on a levee and its propensity to fail?

A Certainly, as the water rises on the levee, I guess our experiences are that levees would tend to fail at some peak in the flood or, as the flood level gets higher on the levee, the higher the water level

gets. If there's to be a breach, that's when I would expect it to occur. And in saying that, what we're also saying is does it increase flooding, or the area -- whatever is going to be flooded is already flooded. The waters come up, it's reached the top of the levee. If the levee breaks at that time, all this area has already been flooded so it doesn't change or reduce the amount of area flooded, it's already been flooded prior to the break in the levee. The water's come up, land has gone under water, levee breaches. If there's any effect at all from that breach, maybe the water will drop, but that area has already been flooded.

Q Okay. Now, you also had some opinions concerning the plaintiffs' or Dr. Mutter's dike versus no dike theory. Why don't you restate your opinion, if you would, please, so I don't get it wrong, and I'll ask you for the basis of that.

A Okay. My earlier comment, very first comment this morning was one of the plaintiffs' approach, and I'm talking just the approach to comparing a dike and a no dike scenario. I said it did not make sense to me, and the reason I said it doesn't make sense to me, and I'm talking the approach, we have an event in November, 1990, that really happened.

We know it. We measured it. We modeled it. It

really happened. Now we're trying to compare that event to a scenario that's never existed in the history of the Skagit River.

Q And what is that scenario that's never existed?

A The scenario that's never existed is simply to take out the levees, claim that that is the effect of the levee. From my opinion, for this comparison, to make any sense, we have to have a base case, and the base case is if I'm going to look at a case with no levees, then I have to go back in time to a point when there weren't levees, and if I'm going to do that, then I have to put everything else that was in place.

I think we've spoken a few times today, there are a lot of things going on in this valley. Burlington Northern Railroad, the bottle neck at the bridge, the railroad across SR 20, Dike District 12, Dike District 17, big flood control reservoirs. If we're going to look at a no dike scenario, in my opinion, the base case has to be back in time, back in time when there were no levees and what physical conditions existed at that time. Take the reservoirs out, put in what -- put the forest back in.

I think what we're doing now, in my opinion, is apples and oranges. It's an interesting exercise but, in my opinion, it doesn't provide the base line condition for comparison to the time when levees did not exist. And what I'm suggesting is a situation, to make this a proper comparison, is to have a base line that goes back in time, no levees. Put everything else back in place and then we've got apples and apples and, in my opinion, that's the appropriate comparison that would have to be made.

Q Now, did Dr. Mutter take out the reservoirs, the upstream reservoirs when he did no levee analysis?

A It did the same scenario as if the reservoirs --

Q Did he put in the forest that had been there?

A I'm not aware of that anywhere in the basin, or even on our local flood plain that used to be forested, and

how water would move through our local flood plain would be different in more of an agricultural setting.

Q And do you -- if this lawsuit is attempting to measure or attempting to assess whether or not there is anything done by Skagit County during a particular time period to increase water surface elevations in the Nookachamps, does the model that has been

developed by the plaintiffs, in your opinion, make hydrologic engineering sense?

MR. HAGENS: I'm going to object to that unless there's some foundation laid as to what analysis this gentleman has done, if anything, as to what Skagit County has done or not done with respect to these levees.

THE COURT: I'm sorry, I didn't understand the question.

MR. SMART: I'll rephrase the question. My question is simply whether or not he thinks that the plaintiffs' model makes sense for the purpose of evaluating what Skagit County has done with respect to these levees.

MR. HAGENS: Well, again, Your Honor, I think some foundation should be laid as to -- my understanding, this witness hasn't studied the projects or Skagit County's involvement in them, so I think some foundation has to be laid as to whether he knows about Skagit County's involvement, the relationship between the dike districts and the county, the funding --

THE COURT: Except I think the point of the question is -- presumes that the witness can evaluate the modeling that was done by Dr. Mutter.

MR. SMART: Right.
THE COURT: And then address it from the standpoint of whether or not any activity, whether the county did it or anyone else, or the effects of any activities that have occurred since the development of the Skagit County.
MR. HAGENS: I would have no objection to that question, Your Honor.
THE COURT: So I probably confused Dr. Melone with my paraphrasing of your question. You go ahead and I'll allow you to do that.
Q Dr. Melone, if this case is about assessment of what, if any, effect Skagit County has had on increased flood levels in the Nookachamps, does the plaintiffs -- in your opinion, does the plaintiffs' expert's model make hydrologic engineering sense to address that question?
A The model does not, I think, assign responsibility, but it represents structures, as we've talked about today, that all collectively and cumulatively affect water levels in this valley, none of which am I aware are the county's structures.
Q And, in fact --
MR. HAGENS: Objection. That last one, I want some foundation as to what he knows about what the

county did or didn't do. I took this gentleman's deposition. He made no effort to find out who did what. That's what I was worried about, that he would sneak some question like that that would require a conclusory statement without laying any foundation as to what effort he's made --
THE COURT: That's a fair objection. The last part of the question did presume some knowledge on his --
MR. SMART: It doesn't presume any knowledge, or wasn't intended to.
Q My question is, the model that they prepared doesn't attempt to segregate out the activities of anybody in terms of development of a system of civil works from the start of time to the present day, does it?

A Not that I'm aware of.
Q And it doesn't assign responsibility, doesn't attempt to attribute responsibility to any particular individual, so that all they have presented is something that is a measurement of what happened in the 1990 flood versus a mythical condition that never existed back before the levees existed; is that right?
A I believe that's been my testimony, yes.
Q And even with respect to that mythical condition that

existed back -- Mr. Mutter referred to as the turn of the century in Exhibit 955, it doesn't describe the actual conditions at the turn of the century does it?
A No, it does not.
Q Because it doesn't take out the upriver storage, it doesn't take into account the forest cover or changes in topographic conditions and the forest cover, things like that. Doesn't do any of that, does it?
MR. HAGENS: Your Honor, that's a leading question, Your Honor.
THE COURT: That's fine. Go ahead. You may answer.
A It does not create what I would call the proper base case for comparison.
Q Okay. Now, even assuming that the plaintiffs' model had been premised on some proper base case scenario, you indicated that you had identified some problems or flaws in it; is that correct?
A That's correct.
Q And can you tell me what those flaws are?
A Okay, again, prefacing the same as you have, I've given my opinion and concerns on the approach. Aside from that, aside from the approach, I have two

concerns related to the calibration of the model.
Remember when I mentioned the reason you do a calibration is to show that your model reproduces an event that has actually occurred? Having done that, then you can apply your model to other conditions. I had two concerns. One, I would -- one had to do with the debris buildup upstream from the bridge. The high water marks that I surveyed upstream from the bridge show a debris buildup at the bridge and, in my opinion, there were not adequate calibration points in the plaintiffs' model to recognize the debris buildup. That was point one. Two, which I think is a very significant one, the exhibit that we're looking at here that's called turn of the century --
MR. SMART: And, for the record, this is Exhibit 955.
THE COURT: All right, thank you.

A It's noted as "turn of the century", and it lists a flood elevation of elevation 31 at the BNRR bridge.

Q Okay. And in your review of Dr. Mutter's modeling, did he, in fact, consistent with this exhibit then, his testimony in the trial which you weren't here for, was there, in your review of his model, an elevation that was computed by the model to be 31

feet at the Burlington Northern Bridge during -- in his no levee scenario?

A Yes, I would believe that's where the plaintiffs got the information on the model.

Q And you've seen that number in your review of Dr. Mutter's model, correct?

A Yes.

Q And the turn of the century condition, that's back in this -- where did our floods go? That's back in this 1897 to 1906 time frame where we had two floods of 190 and 180,000 cubic feet per second, correct?

A That's correct.

Q What was the concern about this particular number that was produced by Dr. Mutter's model?
A Okay. On that chart, or on the graphic you're showing, the table, it states "Turn of the century, a time period," and what's the top line say?
Q It says Mutter, Water Surface Elevations, Elevation Condition -- strike that. I want says Mutter, Water Surface Elevation, Turn of Century Condition.
A Okay. Turn of the century means a no levee. This is a model result of a no levee scenario at the turn of the century. I looked into the historical record published by the USGS. In that public record, in

their published record is an estimate of the flood elevation at the Burlington Northern Bridge in the 1906 flood, and that flood elevation is 37.
My concern, and from a calibration point of view, is elevation 37 for that location at approximately the turn of the century, as this table says, is far higher than the elevation 31 that came out of the model.
Q Now, showing you Exhibit 1394, is that the -- can you identify that, sir?
A Yes, I have it.
Q Can you identify it for me, please?
A This is just a photocopy from records published by the USGS where they publish annual flow data and they provide summaries of water levels from other extreme floods. It's an annual publication of their record by the USGS.
Q And there's been testimony from, frankly, all the experts in this case the USGS is a standard source of information for hydraulic engineers; is that correct?
A USGS is the government agency that monitors stream flow, records it, publishes it.
Q And does the Exhibit 1394 -- excuse me, is that the right number?

A 1373.
Q I'm sorry, does Exhibit 1373 have in it the published height of the flood in 1906 at the Burlington Northern Bridge.
A Yes, it does.
Q And that number is?
A And it is the elevation 37 feet that I mentioned.
MR. SMART: Offer Exhibit 1373, Your Honor.
MR. HAGENS: Mr. Melone, you're aware, you read Mr. Mutter's deposition that he calibrated in accordance with the 1975 flood. Do you recall him testifying to that, that he calibrated his model using the 1975 flood?
THE WITNESS: I would imagine he could have.
MR. HAGENS: In fact, he did, if you read his testimony.
THE WITNESS: Okay. He calibrated.
MR. HAGENS: What does some flood in 1908 have to do with the calibration using a 1975 flood?
MR. SMART: That doesn't have anything to do with the admissibility.
MR. HAGENS: Yeah, it does. What's the relevance of this?
THE COURT: I agree. It does. Go ahead. You may ask.

MR. HAGENS: So can you tell me what a 1908 event has to do with a calibration that was based on a 1975 event?
THE WITNESS: A calibration is a process of convincing yourself as a modeler that your model reproduces an event that has occurred. This modeling simulation is called the no levee scenario. It's not the 1975, it is called the no levee scenario representing the turn of the century. What I am saying is the published record says at the turn of the century, the flood elevation at that point was 37, which tells me, as

a modeler, I have to ask myself is my model correct. I am not reproducing this elevation 37.

MR. HAGENS: In other words, you're not saying that -- what you're saying is this is a check on the calibration then to use 1908, even though you used 1975?

THE WITNESS: I'm certain that 1975, when he calibrated to 1975 he used 1975 conditions. When he did his no levee, obviously it was not 1975 condition, it was a no levee condition, to which a modeler has to ask himself now that I've done this, how do the numbers look. And what I am saying is the plaintiffs' model had a number that said at the

Burlington Northern Bridge would be 31 at the turn of the century.

I'm making a very simple point. The published record says at the turn of the century that the flood level of 37 was observed there, to which you have to ask yourself is the model properly reproducing that no levee scenario.

MR. HAGENS: No objection, Your Honor.

THE COURT: All right. Counsel?

MR. ANDERSON: No objection.

THE COURT: We need to take the remainder of our recess. It ran a little over five minutes. Let's make this ten minutes. That will give us a good break, and go from there.

Thank you.

(Recess was taken.)

(Whereupon, the following occurred in the presence of the jury:)

MR. SMART: Your Honor, with respect to 1373, I can't remember if the objection was withdrawn or it hadn't been ruled on yet, but Sally didn't be show it as admitted.

THE COURT: I think it was withdrawn.

MR. HAGENS: Yes, it was, Your Honor

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THE COURT: So it will be admitted then. In fact, I think Mr. Anderson had just been able to get in the fact that he had no objection as well.
MR. ANDERSON: Yeah.
THE COURT: Thank you.
(Whereupon, Defendant's Exhibit No. 1373 was admitted into evidence.)

Q Showing the jury then 1373, this is the USGS Water Resources Data for 1994, and it indicates, as testified to a moment ago, that the -- I got to find it. Here we go. That the flood elevation for 1906 was 37 feet at the Great Northern, now the Burlington Northern Railway; is that correct? Is that correct, Dr. Melone?
A Yes, it is.
Q Now, prior to the time you testified in this trial, in fact, several months ago now, the plaintiffs put into evidence an exhibit that they said was the historic data from the USGS. I'd like you to come down here and take a look at Exhibit 200 and see if you can find this 37 foot elevation anywhere on Exhibit 200.
A No, I do not see it on this exhibit.
Q And, in fact, their exhibit starts in the year 1907, one year after the 1906 flood; is that correct?

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A Yes, it is.
Q All right. Now, the 37 foot elevation was for a flood of 180,000 cubic feet per second, correct?
A Yes.
Q Have you estimated what the elevation would be that is implicated by the 37-foot elevation for a flood of

152,000 cubic feet per second like the 1990 flood?
A Yes.
Q And how can you have you done that?
A I used, again, the rating curve that gives some relationship in this area between level of water and flow. If we were to take this 180,000 that occurred in 1906, produced an elevation of 37, if I backed that down to 152,000, I would say the water level would be based on the rating curve about two and a half feet less than elevation 30, so 34.5.
Q So for a flow of 152,000 cubic feet per second as represented by the Mutter turn of the century condition, rather than an elevation of 31 feet, we should see an elevation of 34.5 feet; is that correct?
A That would be my estimate based on the published record for a higher flow in that year.
Q Now, if there's three and a half feet of difference between what Dr. Mutter's model computes as the turn of the century condition and the actual number as

determined from the observed level, is that an error that is going to be propagated throughout this computation of differences in flood levels supposedly caused by the levees?
A Yes.
Q All right. And could you come down and, referring to Exhibit 210, explain to the jury how that occurs.
A Again, and I want to preface this comment by my earlier opinion that I don't endorse -- I do not feel this is the base case for comparison for the reasons that I have discussed with you. Putting that aside, we're asking, if this isn't six feet -- you see how it is here, six, five, four, three, two, gets less as we go upstream the way this is, six, five, four, two, if this number isn't

six, it's three and a half, then it's going to be three and a half here and something less, and the same way less, where we're here down to .5 or 1, we may be down -- I don't know, we may be down to something in the order of 1 way back here. It's definitely three and a half feet less, will propagate upstream in a similar fashion that these numbers do, and get to much smaller numbers. Every single number up here will be something less than three and a half, given that observation from 1906.

Q Is it common practice for hydrologic engineers to take

their computed model numbers and compare them against the actual numbers that are recorded by the USGS?

A It's common practice to use all the information you have available to you in developing a model. We have to keep in mind -- you have to input the right information into the model so it can give you good information back, and the only way that you know you're doing that is if you've reproduced some event that's occurred in the past.

Q And do you have any explanation for why Dr. Mutter left out this 37-foot elevation, which is an observed elevation by the USGS at the Burlington Northern Bridge?

MR. HAGENS: I'm going to object to the form of the question. There's no testimony that Dr. Mutter left it out. He calculated his model on the '75 flood flows. What he's saying, maybe he shouldn't have taken it into account, but there's no evidence he left it out.

Q Let me ask you this question. Do you have any explanation for why the plaintiffs left out this observed elevation from Exhibit 200?

A No, I certainly would not have any explanation.
Q And do you have any explanation for why there's an apparent leaving out of the number in terms of the calibration process so that instead of 34 and a half feet you get 31 feet --

A No, I wouldn't know.
Q -- in their turn of the century condition?
A I have no explanation.
Q Thank you Dr. Melone. I don't have any further questions at this time.
THE COURT: All right, Mr. Hagens.
CROSS EXAMINATION
BY MR. HAGENS:
Q Good afternoon, Dr. Melone. How are you this afternoon?
A Good.
MR. SMART: Excuse me, Your Honor, just one -- Sally correctly points out, I thought I had offered 1361, the other rating curve. She says I didn't.
THE COURT: I didn't listen.
MR. HAGENS: No objection.
THE COURT: 1361 will be admitted.
I'm sorry, Mr. Anderson, you haven't had any objections along the line of --
MR. ANDERSON: No, no objection.
(Whereupon, Defendant's Exhibit No. 1361 was admitted into evidence.)
THE COURT: When you finally do, you'll let me know.
MR. ANDERSON: I will, Your Honor.

THE COURT: That was the -- you know how I make a little name for it. That's the second rating curve?

MR. SMART: Yes, Melone rating curve.

Q (By Mr. Hagens) On that last point before we get to this, you understand -- you read Dr. Mutter's deposition, didn't you?

A Yes, I did.

Q You understand he calibrated using the 1975 numbers, didn't you?

A Yes, I did, yes.

Q He didn't go back before 1975, did he, to calibrate his model?

A Pardon me?

Q He didn't go back?

A What do you mean, he didn't go back?

Q In time to other events to calibrate his model.

A That was my point.

Q I understand it was your point. When you did your model, what did you do?

A We calibrated to the 1990 event.

MR. SMART: Excuse me, Your Honor. Could the witness finish his answer, please.

THE COURT: Right.

A He represented a condition that he called the turn of the century without making reference to information that

was available at the turn of the century. That was not the 1975 model. That was a different model. That was a model that had no comparison to 1975. It was a model that we remove the levees, this exercise of remove the levees without changing anything else, and it is no longer the '75 model.

MR. HAGENS: Your Honor, this is not responsive to my question, which asked if he calibrated using data back in 1906 on his own model. He wants to go back and make a big argument about what our expert did or didn't

do. I just asked him whether his model was calibrated using any 1906 data. I think I'm entitled to an answer to that question.

MR. SMART: Your Honor, that was the next question that was asked over the answer which was, to the earlier question, which was what did Dr. Mutter do, and that's what Dr. Melone is now answering.

THE COURT: Right. But I think the answer has become non-responsive to either one.

A I'd be happy to answer. I did not calibrate to 1906 because I did not do a 1906 computer run.

Q I understand that. You didn't use any 1906 data to corroborate or calibrate your model runs at all, did you. Just yes or no to that?

A There is no yes or no. I did not do a no levee or a

1906 or turn of the century computer run.

Q I understand that, but --

A That was the question.

Q No, that wasn't the question. The question was did you use any 1906 data to calibrate whatever computer runs you did do. That can be answered yes or no.

A I used the 1990 flood data to calibrate my 1990 flood model.

Q In answer to my question, you didn't use any 1906 data to check the calibration of your computer model, did you?

A No, I would have no reason to use the 1906 model.

Q Let's try to get back to basics here, Dr. Melone. This is Exhibit 202. It's probably not as fancy as some of the nice things you put together, but I take it it pretty much tells the whole story. That is if you put levees on one side of the river and don't have them on the other, the effect will be you're going to have more effect on flooding on the area that doesn't have levees.

A As a text book example of putting levees in and changing absolutely nothing else, I would agree with that.

Q Then the question becomes, having done that, putting

levees on one side of the river and not on the other, the consequence of that is that the people on the right bank here around Burlington didn't get flooded in 1990,

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people on the left bank, our clients, did. You understand that to be the case?

A I thought you told me this was a conceptual sketch. Is this an actual sketch?

Q You know that to be the effect, do you not?

A I'm trying to understand what you're showing me so I can answer.

Q Let's try a little harder.

A Is this conceptual?

Q You understand that our clients got flooded in 1990. You understand that to be the case; isn't that right?

A I understand that your clients have been flooded from the beginning of time.

Q So our clients have been there from the beginning of time, is that your testimony, Mr. Melone? Can we not be smart? Can you try to answer the questions this afternoon?

A Can you repeat the question, please.

Q Yes. You understand our clients were flooded in 1990; is that right, Mr. Melone?

A I understand that your clients were flooded in 1990.

Q And you understand that the people in Burlington and Sedro Wooley -- strike that -- Burlington and Mount Vernon weren't flooded in 1990, correct?

A I understand that.

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Q And one of the reasons our clients were flooded and the people in Mount Vernon and Burlington weren't is because, unlike the people in Burlington and Mount Vernon who are protected by levees, they are not, as depicted in Exhibit 202, right?
A I agree that the levee prevented residents of Burlington from being flooded. I do not agree that that made flooding any worse for your clients.
Q So you think they would have suffered the same amount of flooding with or without these levees, is that your testimony?
A I think my testimony today has been the comparison of apples and apples to a base case, that if we're going to remove the levees, we must go back to a point in time when there were no levees.
Q Let's try to answer.
A That's base case.
Q I'm not interested in getting into your base case, I'm trying to get my question answered, which is you said they wouldn't have suffered any greater flooding had there not been this situation as depicted on Exhibit 202. Did I understand you correctly?
A I said that I don't believe that your clients were flooded any worse than they would have if we went back in time to when there was a no levee condition.

Q Okay. But you haven't done that analysis so you really don't know how much they would have been flooded if we'd gone back in time and put all our clients back on that property and the forest back in there and taking the reservoir out. You haven't done that work so you really can't come to that conclusion, can you, Dr. Melone?
A That's correct.
Q You made an opinion right there that you didn't have any basis for, isn't that right, Mr. Melone.
A No, that is not correct.
Q Let's try another question.

A Can I answer the question? I have stated that there are a number of structures out there that impact flood levels. All of them, including the Burlington Northern Bridge, the Burlington Northern Railroad and the dikes and the flood control reservoirs all have an impact.

Q I understand that, and that gets me to my next point. The plaintiffs' expert, as you understand it, and you said it correctly, took out all the levees, said how much would the plaintiffs have been suffered if all those levees had been removed, and he came up with Exhibit 210, and in addition to 210, he came up with Exhibit 211, a summary of the flooding caused by the levees, okay. This is the flooding that he attributes to the levees. You take the levees out, these clients

have -- to summarize, it was about one and a half to four feet less flooding, maybe not quite four feet. I think the highest number here is 3.8 or 9 or something like that on this list. This is not, just -- if I can just get an answer yes or no, this is not something you attempted to do, that is determine how much the levees were affecting plaintiffs. That is true, isn't it?

A I have explained why --

Q Is that true or false?

A Why we did not do that analysis?

Q I didn't ask you why. I'm asking is it true you didn't attempt to.

A I'm saying it is true, and we've explained the logic behind those decisions.

Q I'm just asking whether it's true that you didn't undertake to do this; isn't that correct?

A That is correct.

Q And there are some other things that you didn't do besides attempting to investigate or study the amount of flooding on plaintiffs' property caused by the levees. Something else you didn't do besides that is investigate the amount of funds spent to construct or improve the levees. That's also true, is it not? Yes or no?

A That is absolutely true.

25 Q And you also undertook no investigation of the permit

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CROSS - MELONE

process to -- up there in Skagit County to determine what permits, if any, were waived or exempted or required. That's true, isn't it?
A I am not an expert in the permitting or the funding of any projects.
Q And you've also undertaken no investigation of projects to determine the amount -- to determine if the levees were strengthened over time. That's also true, is it not?
A I have undertaken the analysis necessary to determine if there had been any changes that affect flood levels. Strengthening a levee, as I testified earlier today, does not raise a flood level in and of itself.
Q So you didn't look at, as did plaintiffs' experts, various projects such as depicted on Exhibit 206, the installation of keyways, the --
A Excuse me, I can't see it very well. You have to turn it a little bit this way or move it a little bit better. Still can't.
Q Can you come on down here then, Mr. Melone, and if you'll stand over there by the end of this and speak up so the Court Reporter -- you didn't look at projects, for instance, historical projects over time that entailed the installation of a keyway, did you?
A I did not look at any project that did not affect flood

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CROSS - MELONE

levels.
Q So the answer to my question is no, right?
A Of course not.

Q And you didn't look at projects that impacted, such as strengthening, adding fill or ballast to the levees, did you.
A I already testified, strengthening a levee does not affect --
Q I didn't ask you whether strengthening the levee affected anything. I asked you whether you looked at any projects that did this kind of work. Did you look at any project that did this kind of work?
A I would have no reason to look at those projects.
Q And you didn't look at any projects that dealt with riprap or armoring the side of the floodway, did you?
A I would have no reason to look at that.
Q Okay. You can resume the stand.
And so, having not looked at any of those projects, you would not be in a position then to explain to the jury -- this is Exhibit 335 in evidence. It's a summary.
A Again, I can't read it from here. If you can get me a copy I'd appreciate it.
Q Sure. I'll be happy to.
If you'd take a look at 335, this is an overview

of the historical increase in dike flood protection level in Skagit County starting from 1963 through 1990, and it shows in 1963 from Plaintiff's Exhibit 6 that have there was then a six-year frequency flood protection level. Do you see that on that exhibit?
A I see that, but I don't know where on the Skagit River we're referring to.
Q I'll be happy to pull each one of these exhibits, but I'm not going to keep you here and the jury here to do it, okay. I'm going to say that's an overall evaluation of the protection level of the system at that time.
MR. SMART: Your Honor, I object. And I think that he should ask a question rather than make a statement. There's already been a lot of colloquy about

this exhibit. There is some disagreement as to what it means, where it comes from. If he wants to ask a question I don't have an objection, but for counsel to tell the witness what it is isn't a proper question.

MR. HAGENS: I think I'm entitled to summarize the exhibit and let the jury decide --

THE COURT: The jury will call -- will make a decision as to whether or not your summarization is correct.

You may proceed.

Q We're talking about in 1963 about an overall protection

level, seven-year frequency of floods, and then we move up to 1990 which, at least according to one exhibit at one time, was characterized as a 40-year event, and the levees protected against it in all places except Fir Island, okay. Are you with me so far, Dr. Melone.

My question is, how do you get from a seven-year flood protection level to a 40 -- or at least 25-year protection level unless you're improving and strengthening the levees? How do you do that, Dr. Melone?

A The way you -- first of all, as I've stated, I don't know where on the Skagit River we're referring to here. As I have indicated, the levees, certainly for the last 40 years, have not been raised for the levee extension. For the last 40 years have not changed. What these numbers mean, I have no idea where they came from, what the basis was for putting them in or how they can justify them if the levee heights have not been increased.

Q So, actually, your testimony, to be more specific though, is not that the levees haven't been changed but that they haven't been changed or raised anyway north of

the -- and this is Exhibit 1362 -- north of this point here, beginning of 1955 levee realignment; isn't that right?

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A That's correct.
Q So you don't know if south of that point there's been any raising or strengthening the levees, do you, Mr. Melone, because you weren't asked to study that, did you, Dr. Melone?
A I have uncovered no documents. The two-mile stretch which takes in most of our reach here we do have the data for.
Q So you do have the data for north of this area, that is going up the river?
A A two-mile stretch through there.
Q Right. But you don't have any -- you say you found no data, you haven't looked for any south of -- allow me to finish the question, please, Dr. Melone -- south of this point, is that correct?
A Yes. I've looked for that data, and I've gotten the declarations or read the declarations by the dike district that they have not raised them.
Q Maybe the dike district commissioners could come and tell us about that.
You're saying there were no keyways put in anywhere along this section of Dike District 12 and, by the way, this is only part of Dike District 12.
A No, we've already established that I have not researched keyways, and the raising of levees changes flood levels.

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Q So your testimony is that the only way you can increase protection level is by raising the levees; is that right, Dr. Melone?
A That's true.
Q You can't obtain increased protection by widening the levees and putting keyways in; is that right?
A I wouldn't call that increased protection.
Q All right. So if the county spent money on this and the dike district spent money on these various projects, millions of dollars over the last 50 years or so, that would be a waste of money because unless they raised them it would be a waste of time to do so, is that your testimony?
A I don't think I ever heard myself say that, no.
Q That's right. You haven't said that because it wouldn't be true. In other words, the reason you put keyways in and the reason you add ballast and the reason you put riprap on, these other projects, raise these -- in fact, raise them in some areas, not the area you're talking about, this very limited area north of the beginning of the 1955 levee realignment, but the reason you put these keyways in is to strengthen them, prevent failure?
A I don't think anyone's ever designed a levee that they want to fail.
Q Right.

A So anything you can do to prevent a levee from failing, I would support that activity.
Q So at last you agree then that -- this is another exhibit on file, Dr. Melone. This was produced by the Skagit County in connection with the advisory committee's request.
A Excuse me, in connection with what?
Q Advisory committee.
A Of what?

Q Skagit County Flood Control Advisory Committee requested a map. This is one that was prepared at the request of that advisory committee. It's Exhibit 3022. And if you'll come down here, you'll see where it depicts all the breaks in the levees -- you see where all these breaks were -- here's one in 1921, 1932, almost here by the Burlington Northern Bridge, 1917. It shows earlier breaks in there. Do you see those?
A Yes, I do.
Q And you see further breaks even downstream of what is called the riverbend down here. 1909, 1994, all the way down the river. Is that right?
A Yes, I see those.
Q Including one down here in 1951 in Fir Island it seems to be down there there's another break in there, right about where it broke in 1990. Is that about where it

broke in 1990?
A I don't know the exact location of where it broke in 1990.
Q You don't know where it broke in 1990, but you have an opinion that it didn't have any affect?
A My opinion is based on the data and information at the site location.
Q We have all these breaks over the past years, but you don't have any in 1990 or again in 1995, did you, Dr. Melone?
A I'm not aware of any in 1990 in our area of interest.
Q Okay. You can resume the stand.
A (The witness complies.)
Q And I wanted to show you another exhibit that I think deals with this question of strengthening levees. This is an exhibit that's in evidence, Exhibit 207. You reviewed, I think, you told me in your deposition anyway, the 1979 lower levee project, and this is the General Design Memorandum that was done in connection with it and -- Carrie, what exhibit number is this? I'm going to show you Exhibit 984. Now, Mr. Regan came here who, unlike you, worked for the Army

Corps of Engineers for 30 some odd years and was the lead hydraulic engineer on this project, and told us about this failure sequence here. In 1979 -- prior to

the 1979 lower levee project, Exhibit 207 and the Corps of Engineers had predicted the levee breaking at various points. This is Exhibit 984 that I was mentioning. It shows the sequence of failures. Would you take a look at that.

You looked at this lower levee General Design Memorandum, didn't you?

A Yes, I have.

Q And one of the things he showed on this exhibit were projected failure errors by the Corps in 1979 when this work was done. You'll notice, as he testified, at point eleven on Exhibit 207, this point right here, sequence number eleven, he said that area would fail in a 50-year event at 149,000 and in a hundred year event the Corps predicted it would fail at 150,000. Do you see that on the paper you're holding there?

A I see it on the table there. I don't know --

Q And then we had in 1990 152,000 and it didn't break, Dr. Melone. How do you explain that if the levees weren't strengthened considerably in that area?

A I would question anyone's ability to walk out and look at a levee and say it will fail exactly at 149,000 cfs, not five cfs more or five cfs less.

Q You know something, Dr. Melone, this, unlike your testimony, this Exhibit 207 was prepared before this

litigation, not after it started, and this was a good faith attempt by the Corps of Engineers to predict sequence of failures that would occur based upon their knowledge, as the most knowledgeable people in the delta area, or Skagit delta area.

A My answer's the same.

MR. SMART: Objection, Your Honor. That's not a question.

THE COURT: Okay. You may proceed.

Q What you're saying is the Corps of Engineers didn't know what it was talking about when it did all this work in 1979 and Mr. Regan didn't know what he was doing when he did this study back in 1979?

A You may be saying that, but I have never said that.

Q So what we know from this exhibit, Dr. Melone, is in 1979 the Corps predicted that at point eleven would fail at 149 in a 50-year event and 150 cfs in a hundred year event and, in point of fact, it survived both in 1990, November 25, 1990; isn't that right?

A It survived -- it survived the flow that I think everyone evaluated it to survive.

Q All right. So let's go on to another area.

The only way you can survive and improve the protection level is with these keyways and riprap projects that we've discussed in here. What you're

saying, if I understand you, that the only way to improve -- to increase the protection level is to raise the levees, and these keyways and these riprap projects, they don't have any effect on levee protection?

A I don't think I said anything like that or was asked that question. What I have said, it's the raising of levees that affects flood levels.

Q And you understand, do you not -- in fact, I think you even admitted in the course of your deposition that if you have a break, there's likely to be some relief in the Nookachamps-Sterling-Clear Lake area; isn't that correct?
A Yes, I did say that.
Q The reason for that, it's going to drain that area out, right?
A The reason for that a breach would draw water down in that local area.
Q So, depending upon when that breach occurred, there might not be as much water in that area; isn't that right, Dr. Melone?
A If we have breaches, there would certainly be a different flow path.
Q And if we don't have breaches you can expect that area to get flooded more and more. The higher the flood level, the higher the cfs, the higher the flood level?

A I don't know what you mean by more and more. I think we're talking less than more. We have a flood elevation if, unfortunately, flood fighting or maintenance was not adequate and you had a levee breach, you would then obviously flood someone else at lower flood levels.
Q And as one of these exhibits I just showed you, that's happened over time, hasn't it? There has been failures there?
A I would imagine behind every one of those breaches there would be someone who was impacted.
Q And our clients get impacted every time, according to you, it gets over 65,000 cfs.
A No, I didn't say that.
Q Some of them do, don't they?
A I would like to repeat what I said.
Q Sure, please go ahead.
A What I said, at about 65,000 cfs water begins to go over bank and flood onto these properties. It's also true at

65,000 cfs I don't think we are at any of the -- I don't think the levees are even coming into effect at 65,000.

Q Do you know? What's this "I don't think." You haven't done any studies to determine when the levees come into effect, have you?

A Yes, I have.

Q Go ahead.

A I have looked at a flow of 65,000 cfs in the river and concluded that that flow is not up against the levees in Dike District 12.

Q That's kind of what the plaintiffs' experts concluded. Dr. Mutter, using Exhibit 212, said he used as his benchmark 80,000 feet. Mr. Regan used something like 75,000 cubic feet per second as kind of the benchmark when the area starts to be flooded by the levees. That's not something you disagree with, is it, Dr. Melone?

A It appears to be a reasonable number.

Q And then I heard your testimony, you said the greater the flow, the greater the elevation. Am I right so far?

A That is true.

Q That's a generalization, right?

A Generalization.

Q And here on Exhibit 1366, however, I notice that the 1990 event, which was 152,000 cfs, has -- to use the defendant's exhibits, at Mount Vernon compared to 144 cfs at Mount Vernon. If I understand what happened here, this shows the reverse relationship, doesn't it?

A Yes, it does. Up at Sedro Wooley it was the reverse.

Q So this seems to be some kind of aberration then from more water higher flood elevations general proposition; is that right?

A I wouldn't call it an aberration. I would say in 1951 had higher flood levels for 1990 for a lower flow rate.
Q Higher flood levels where?
A At the Sedro Wooley -- in the area of Sedro Wooley.
Q Okay. And then there was -- returning to this question of improvements, and this is a 19 -- Exhibit 174, Mr. Nelson came and told us, you know, firsthand what's been happening on these levees up there since, I don't know, sometime in the eighties when he went to work for the county, retiring in March or April of 1991. One of the exhibits the plaintiffs were most interested in was Exhibit 174, which is a report on December 20th, 1990, following the November, 1990 floods. And in that report he talks about the improvements. Did you expect Mr. Nelson to know anything about these improvements up there, by the way?
A I would expect so.
Q And here he says -- talking about the improvements over time, he says those improvements not only make the dikes "higher" is the word he, used but also stronger in order to minimize seepage and blowouts. You see that? He says higher. They made them higher, so he would even comport with your requirement unless they're higher you can't really increase flood elevation levels, so, according to Mr. Nelson, who was up --

A Are you saying they're higher? Is anybody saying they're higher?

Q Yeah, absolutely some people are saying they're higher.
In fact, let's get out Mr. Loeb's pictures. And Mr. Loeb comes down here. He's got pictures. And this is 3066A to C, A, B, C. He's 3066. Do you want to come down here? You better come down here.
See Loeb there, 3066A to C. And these are in 1997, and he shows us -- this is 3066A. He shows right there, by golly you can see it. Now nobody has to do any guessing about this, or estimation. There you can see a level of material having been put at the location of 3066A, right down here at the riverbend area.
MR. SMART: Could we have a question again, please?
THE COURT: You're right. It's not really a question.
Q Well, you understand -- can you see that in this picture?
A I see that. I'm waiting for the question.
Q The question is, so Mr. Loeb has pictures that show us, in fact, the levees have been raised at least in that location sometime in 1995.
A In what year?
Q 1995.
A Okay.

Q So when you asked has anybody said they have been raised, yeah, we have evidence of the actual pictures of having done so. Do you have any reason to dispute this?
A The important point is, that location on the river has not affected flood levels in our area.
Q So now it becomes the location of the raising?
A Of course.
Q And you're saying anything done down here, downriver from the Burlington Northern Bridge, had no effect on the plaintiffs, even though you didn't undertake to -- what the -- you didn't undertake to study or investigate what the effect of the levees were on plaintiffs all of

a sudden downstream of the Burlington Northern Bridge, is that your testimony?

A No, our testimony is we studied it in great detail and demonstrated that there were no impacts at the USGS gauge by any activity downstream of that location.

Q Did you take the levees out and determine what the effect would have been if you'd taken those levees out?

A That is not the only way to do that analysis. We worked with the real data, the real recorded data.

Q You're not suggesting that Dr. Mutter didn't work with the real recorded data, are you, Dr. Melone?

A I am saying if he looked at the same data I did and did the same analysis I did, I'm confident he would have the

same conclusion.

Q Let me see if I can understand. You didn't take the dikes out anywhere along the river and try to then determine how much they were contributing to the plaintiffs' flooding, did you?

A We established that that part of the river did not impact our study reach.

Q Let me ask you again.

A That is the answer to the question.

Q You didn't take the dikes out and then determine what the effect of flooding would have been, and I'm talking about all the dikes down the entire Skagit River, as did Dr. Mutter, and then determine the effect, if any, of flood levels on plaintiff. You didn't do you that, did you?

A No, and I think we've explained that.

Q If you didn't take the dikes out, how is it that you know that this area that is shown in here downriver from the Burlington Northern Bridge had no effect on the plaintiff? If you didn't take them out, how do you know that?

A We know that by looking at the recorded record.

Q And the recorded record is the gauge at the Burlington Northern Bridge and the -- what do you call it, the -- what's this thing called, the rating curve, is that what

you're telling me?
A No, I'm talking about the USGS gauge at the Riverside Bridge.
Q And the rating curve?
A We're talking about the rating curve and we're talking about the record of the recorded flood in 1990.
Q Right.
A We are talking specifically about the 1990 flood.
Q I understand that, and you're saying the rating curve tells you -- and I want to stop you. I want you to tell the jury, if you wanted to run Dr. Mutter's model just as he had done it to see whether he had done it right, your computer would have let you do it, wouldn't it? Your computer had the capacity to do that, didn't it, Dr. Melone?
A We have very good computers.
Q And you have could have run exactly the same computer program that the plaintiffs' expert did, couldn't you?
A I did not have any interest in doing it.
Q I didn't ask if you had any interest. You could have done it?
A Could have what?
Q Got it exactly the same?
A And got exactly the same results?
Q You could have checked to see if he had done it right?

A I could have. I don't understand the question.
Q Certainly you understand the question. You could have done the same analytical approach --
A I guess I don't understand.

Q -- that Dr. Mutter did.
A I guess I don't understand why I would have done it.
Q I didn't ask if you understand why. Removed all the levees with the computer, you could have done that?
A If I was interested in doing that I could have done that.
Q But you didn't do that?
A Wasn't interested.
Q Right. You weren't interested in it because it might corroborate what Dr. Mutter did; isn't that right, Dr. Melone?
A No.
Q In fact, what's the point of running a computer model --
I know what point -- strike that.
You ran a computer model to tell us what the bridge -- the problem that the debris at the bridge was causing?
A No, we ran a computer model to calculate flood depths throughout the study area.
Q You focused not on the dikes but you focused on the Burlington Northern Bridge, and why did you do that? So you could point the finger at somebody that's not here?

A That is not true.
Q What did you do it for?
A What did I do what for?
Q Concentrate on the Burlington Northern Bridge?
MR. SMART: Again, the witness is not being allowed to answer the question.
MR. HAGENS: I'll try to slow down.
Q It's the one thing you did run your computer on, you did focus on your computer on the effect of the buildup of debris at the Burlington Northern Bridge. You didn't run it for that purpose, did you, Dr. Melone?
A You asked me two questions. The answer to the first question is no, that was not the focus of our modeling effort. And, two, one of the things we did was investigate the effect of debris.
Q And you used your model to do that, didn't you?
A Yes, we did.

Q And it told you that there might have been seven to four
inches of flooding caused by the debris at the Burlington Northern Bridge; isn't that right?
A That's correct.
Q That allows you to point the finger at somebody who is not here?
A I'm not aware I pointed the finger at anyone.
Q Then why do it? Why bother?

A We're developing an understanding of the hydraulics of the river system during the November, 1990, flood. And with that understanding we also looked at the effects of structures and features on the flood plain that affect flood levels, and collectively and cumulatively there are many structures, not just the bridge.
Q I don't understand why you'd bother to look at the Burlington Northern Bridge and the debris with your computer model and not tell us whether Dr. Mutter had done a good job according to you, Dr. Melone.
A I think the answer is simple, and that answer is consistent with Dr. Mutter, why would he only take the levees out and totally ignore the time frame and all of the other activities and structures that it impacted, why would he do -- it's an interesting exercise that does not, in my opinion, take us to a base case of no levees.
Q I was hopeful we'd get to that, Dr. Melone, because you know who would be the first person in here complaining we hadn't done it right if we had gone back, put the forest in, taken the reservoirs out, who would be the first person in here complaining about we hadn't done it right, Highway 20 which was there, we didn't have the I-5 Bridge in there during the 1990 floods, of course we didn't have the Burlington Northern Bridge or grade in

there, because we went back to the beginning of time, who do you think would be the first person complaining we hadn't done it right?

MR. SMART: Objection. Calls for speculation.

MR. HAGENS: Doesn't call for any speculation at all. We know who would be telling us we didn't have it right.

MR. SMART: We're not having a question. We're having an exposition.

THE COURT: There's a question implicit it in.

MR. SMART: Calls for speculation.

Q Who do you think would be telling us -- saying we didn't do it right?

A We'd be sitting here telling you you had done it right.

Q That's because you've done it that way so you know that's the right way?

A No, that's my opinion of the right way.

Q You didn't do it that way so you don't know whether it is the right way, do you?

A It's not a "did I do it" question. The question is what would be the best way to do it, the proper way to do this to establish a base case. That's the question.

Q Let's go on to another -- and that's where you and Dr. Mutter may disagree.

And on this question I wanted to ask you if

you've seen Exhibit 469, which I know is here someplace hiding out. I think you may have had something to do with this one, Dr. Mutter -- excuse me, Dr. Melone.

Now, shortly before this case started for trial,

the county -- shortly before this case started to trial
the county, on November 21st, amended one of their responses to their requests for admissions, request for
admission asked "Absent the Skagit County diking system
there would be significant decrease in water surface elevation. "

A Are you starting on the first page?

Q I'm starting on Page 2, Request for Admission No. 2. I'm starting on line eight, Page 2.

A Okay.

Q Request for Admission No. 2. "Absent the Skagit County
diking system there would be a significant decrease in water surface elevation upon some or all the plaintiffs
property during significant flood events comparable to those that occurred in Skagit County in November, 1998."

A It's probably meant to be 1990, but I know what you mean.

Q That's correct, and they point out in their response that it was an obvious error.

Then, as you see on page three, their revised response was?

A Which line?

Q Starting at line seven, "Skagit County admits that absent the levees owned by Diking District Number 12, and assuming all other geographic and environmental conditions are the same as they currently exist, such as
the removal of forest cover, there would be a significant decrease in water surface elevation upon some or all of the plaintiffs' property during significant flooding events comparable to those that occurred in Skagit County in November, 1990."

And you would agree with that, would you not, Dr. Melone?

A I would agree if we did an exercise that just removed the levees, kept everything else the same, ignored all the things that have changed in the valley through the

years, that the removal of the levees and doing nothing else, and ignoring the time period for when there was a time of levees that we would have, as it says here, a decrease in flood levels.

Q Okay. In fact, you were one of the reasons, I suppose, for amending that, because that's not a proposition you can disagree with, is it, Dr. Melone?

A As I've just answered the question, I agree with it.

Q A few more questions before I quit for the day. You can't tell the jury what amount of flooding is caused by

the levees. You point at the Burlington Northern Railroad bridge. You didn't study the effect --

A Go ahead.

Q You didn't study the effect of -- you -- strike that. You didn't study the funding of the various projects and the strengthening of these projects over time and, in point of fact, your marching instructions, scope of your work if you will, in this case was not selected by you but was contrived by counsel for Skagit County; isn't that correct, Dr. Melone?

A I don't think scope of work or contrived scope of works are drafted by a client.

Q Let me put it to you this way. You had your deposition conducted on December 4, 1995, correct?

A If that's the date.

MR. HAGENS: We'd move to publish his deposition, Your Honor.

THE COURT: All right.

Q And, in point of fact, at that time I asked you, well, why hadn't you studied the effects of the levees on the degree of flooding at plaintiffs' property and why did you look at the Burlington Northern Bridge as opposed to

the levees, and other questions of that nature, and then I finally asked you why didn't you look at those items, and you said, in point of fact, something to the effect

that the attorneys had set out the scope of your work, as opposed to you, a professional, setting out the scope of your work. Isn't that a correct paraphrase of what you said in that deposition?

A I think that's true for any client relationship.

Q So you think that the attorney should tell the expert hydraulic engineer what to do and how to do it, including what not to do; isn't that right, Dr. Melone?

A I don't think I've ever said that, nor do I agree with it.

Q Isn't that what it gets down to?

A I didn't agree with it, and I don't now.

Q Let me give you your deposition and ask you to take a look at page 172. Let me ask you if you gave these answers to those questions back in December 4, 1995. You got page 72 --

A Yes, I do.

Q -- in front of you? I'm starting at line nine.

QUESTION: What I'm trying to get a handle on, Mr. Melone, is who determined the scope of the work you were to do in this case, you or the attorneys who are not hydrological engineers.

ANSWER: The attorneys instructed me -- asked me questions. I undertook the work to

answer those questions.

QUESTION: So they formed the focus or the scope of the work you were to do in this case; is that correct?

ANSWER: That is correct.

QUESTION: If you had to determine -- I'm just going to ask you, are those the answers you gave to those questions at that time?

A That's correct.

Q Okay.

A In addition to the next one you stopped reading.

Q I'm sure your counsel will be happy to bring that out.

MR. SMART: Your Honor, I think it would be worthwhile to read the next question and answer.

MR. HAGENS: He can bring it out, Your Honor.

THE COURT: You may do so when it's your turn.

Q So I wanted to get back then -- perhaps this is a good time to quit, Your Honor.

THE COURT: All right. We'll take our leave this afternoon.

Folks, we do have a -- we have some motions again in this case, pretrial -- pre-testimonial materials to take care of tomorrow morning, so, counsel, what's your best guess on the length of those matters in the morning, when you consider all of them in total?

MR. HAGENS: I think, for our side, some I can get done in very short -- two or three minutes, but others -- 30 minutes, 40 minutes would be my estimate.

MR. SMART: For the total?

MR. HAGENS: Total.

THE COURT: That's probably about right.

MR. SMART: For all of us.

THE COURT: Ladies and gentlemen, if you'll be in the jury room at 9:55, we'll make sure that we've gotten our work done and we can just go to work where you're concerned, instead of having what happened this morning which, candidly, in thinking about it before, there was a motion, which I didn't mention that was brought to my attention this morning for the very first time, so we didn't really know it was coming, it was properly done and didn't involve anybody here, so that's

why we had a little bit of a late start this morning.
We'll try to get this thing done by 9:45 tomorrow and get you ready to go by ten o'clock.
And you'll come back whenever the attorneys tell you, and we'll see everybody then again tomorrow.
All right. Thank you.
(Court was adjourned.)