

January 9,

1997

REGAN - Cross (Smart)

1 MORNING PROCEEDINGS  
2 (The following occurred on  
3 January 9, 1997, at 9:38 a.m.,  
4 in the presence of the jury.)  
5 MR. SMART: May it please the Court, Ladies and  
6 Gentlemen of the Jury, Will Smart again for Skagit County.  
7 RICHARD P. REGAN, called as a witness by the  
8 plaintiff, being previously  
9 duly sworn on oath, testified  
10 further as follows:

11 CROSS-EXAMINATION

12 BY MR. SMART:  
13 Q Mr. Regan, it's my understanding that among the other things  
14 that you have been asked to examine on behalf of the  
15 plaintiffs is the history of the Skagit River and the  
16 development of the levee system; is that correct?  
17 A That's correct.  
18 Q Was your testimony yesterday that you had reviewed 60 years  
19 of Skagit County dike history; is that correct?  
20 A I reviewed documents that span that.  
21 Q Actually, you reviewed documents that span an even greater  
22 length of time, did you not?  
23 A It may have been more than that.  
24 Q The exhibit that you talked about yesterday, Exhibit No. 200,  
25 actually goes back to 1907, does it not?  
A That's correct.  
Q Is there some reason you stopped at 1907?

1 A No data before that that I could find on the geological  
2 survey records.  
3 Q And generally, can you tell the jury what you did when you  
4 were investigating the history of the Skagit River and its  
5 dikes?  
6 A Basically, it was reviewing all the documents that we can  
7 find, the USGS report, and numerous others that we discussed  
8 in the testimony.  
9 Q I presume that that included the laws relating to -- I assume  
10 that included the laws relating to diking history, such as  
11 PL99 and the other laws that you related yesterday.  
12 A PL99 I know of. State laws relating to the diking history I  
13 don't know.

14 Q I would like to ask you to look at No. 976, if you would  
15 please. Can you identify what that is for me, please?  
16 A Sure. Document titled "Diking Districts".  
17 Q Statute RCW 85.05.085, is it not?  
18 A This says 85.05.085, yes.  
19 (Defendant's Exhibit No. 976  
identified.)  
20  
21 Q (By Mr. Smart) And did your review of the history of the  
22 dike districts include reviewing the statute RCW 85.05.085?  
23 A I did not review that.  
24 Q And is there some reason you didn't review that?  
25 A No reason for me to review it.

1 Q Well, you testified yesterday, sir, in response as to Mr.  
2 Hagens' question, that you could find no information giving  
3 the diking district or any other entity the right to have a  
4 dike in the location of the existing Dike District 12.  
5 MR. HAGENS: I'll object to that. I don't believe  
6 that that was the testimony, Your Honor.  
7 THE COURT: Actually, counsel, I'm going to have to  
8 have you repeat the question.  
9 Q (By Mr. Smart) Didn't you testify yesterday in response to  
10 Mr. Hagens' question that you could find no evidence that  
11 there was a right of a dike district to have that dike in  
12 that location?  
13 A I don't believe I remember anything like that.  
14 Q Okay.  
15 Well, do you in fact agree that Diking District No. 12  
16 has had the right to maintain its dike along the north bank  
17 of the Skagit River since it came into existence?  
18 MR. HAGENS: Objection to the form. Lack of  
19 foundation, Your Honor.  
20 THE COURT: Counsel?  
21 MR. SMART: He opened up the door, Your Honor. He  
22 asked questions yesterday about the right to have a dike,  
23 right to flood. PL99, Army Corps of Engineers' standards.  
24 Clearly relevant.  
25 THE COURT: Overruled.

1 A Restate the question, please.  
2 Q (By Mr Smart) Do you agree, sir, that Diking District No. 12  
3 has the legal right to maintain its dike on the north bank of  
4 the Skagit River and has had that right since it came into  
5 existence and built the dike?  
6 A I can't give a legal opinion on that.  
7 Q Is it your understanding in research of the history of the  
8 diking districts that Dike District 12 had that right?  
9 A My research of the history pertained to the river conditions  
10 and the dike conditions; it did not research any legal

11 history.  
12 Q So you don't know anything about the legal ramification of  
13 whether or not there is a right to flood or a right to have a  
14 dike or anything like that?  
15 A Never charged to do that.  
16 MR. SMART: I move to strike Mr. Regan's testimony  
17 yesterday then with respect to the right to flood or not to  
18 flood, which was a specific question asked by Mr. Hagens and  
19 answered by Mr. Regan.  
20 MR. HAGENS: Your Honor, the witness already  
21 testified he recalled no such testimony. So I don't know  
22 that there is any testimony to strike, Your Honor.  
23 And I object to his characterization of the examination  
24 because I don't recall once having gone into that area, Your  
25 Honor.

1 MR. SMART: There is a very specific line of  
2 questions, Your Honor, by Mr. Hagens, where he asked Mr.  
3 Regan whether or not he discovered any information concerning  
4 the diking district or the county or the State or anybody  
5 having the right to flood property, which he explained with  
6 this document, by maintaining a dike on one side of the  
7 bank --  
8 Sally, can I have Exhibit 202, the overlay? Must be  
9 204, I think.  
10 I think you will recall the testimony, Your Honor. Mr.  
11 Regan made a big point about demonstrating the effect of  
12 having a dike on one side of the river. And then Mr. Hagens  
13 asked him if he discovered any information concerning whether  
14 or not there was a right to have this property on one side of  
15 the river flood as a result of maintenance of this dike. And  
16 I'm entitled to explore that with the witness.  
17 MR. HAGENS: I recall -- and the witness has  
18 testified that he knows of no such testimony, and that is  
19 consistent with my knowledge. So I don't know what he is  
20 actually talking about, Your Honor. And this exhibit was a  
21 common-sense, as counsel pointed out, explanation of the  
22 effect of dikes in terms of diverting water, not in terms of  
23 having any right to flood.  
24 THE COURT: My recollection, I don't recall this  
25 witness giving -- rendering any legal or legally based

1 opinions in his testimony at all. I furthermore don't  
2 remember him being asked to render any legal opinions.  
3 MR. SMART: The question, Your Honor, was whether  
4 or not he had discovered any information concerning whether  
5 or not the dike district or the county had any right to flood  
6 by having waters extend out over the floodplain.  
7 THE COURT: I could be corrected, and it's  
8 ultimately for the jury to determine in this case whether it

9 recalls it. I don't recall that question.  
10 MR. SMART: I'll bring it to the Court's attention  
11 with the transcript.  
12 Q (By Mr Smart) In any event, Mr. Regan, we agree that you  
13 have not researched, then, the legal history of who has what  
14 right to maintain the dike in this location; is that correct?  
15 A That's correct.  
16 Q But you knew that this dike existed ever since you were with  
17 the Corps of Engineers, Dike District 12's dike, correct?  
18 A You want to use that as Dike District 12, that is an exhibit  
19 just to show what the effect of dikes are. If you want that  
20 to be Dike District 12, I knew Dike District 12 existed while  
21 I was with the Corps of Engineers, yes.  
22 Q And prior to the time that you were with the Corps of  
23 Engineers, in fact, stemming back to 1923 and even before  
24 that, the Army Corps of Engineers had hydraulic engineers  
25 working for it who also were familiar with Dike District 12's

1 dike; isn't that correct?  
2 A I'm sure that -- Corps of Engineers knew about Dike District  
3 12, along with all the rest of the dike districts.  
4 Q And during the course of your investigation of this case, did  
5 you discover that Dike District 12 had received a permit from  
6 the State of Washington to have its dike existing in  
7 perpetuity?  
8 A I have never seen any documents to that effect.  
9 Q Well, when you researched the history of this case, sir, in  
10 order to answer questions about the factual history of the  
11 dikes, is there some reason that you avoided looking for or  
12 determining whether or not permits were granted to Dike  
13 District 12 and the other dike districts to have their dikes  
14 existing in perpetuity on the banks of the Skagit River?  
15 A I had no reason to investigate that. That was not my charge.  
16 Q Your charge, sir, was to provide testimony regarding the  
17 history of the Skagit River and the development of the levee  
18 system, correct?  
19 A That's correct.  
20 Q And is there some reason why in carrying out that charge you  
21 didn't look to see whether or not there had been many permits  
22 granted by the State of Washington to Dike District 12 to  
23 keep a dike on the right bank of the Skagit River in  
24 perpetuity?  
25 A There was no reason for me to look at that.

1 Q Is that because you already knew it?  
2 A I did not know it.  
3 Q Okay.  
4 When you research the history of a particular river  
5 system, do you follow a particular protocol, usually?  
6 A Basically.

7 Q And does that protocol usually exclude researching the  
8 history of what permits had been granted and by whom with  
9 regard to dikes?  
10 A As a hydraulic engineer, I have no interest in that.  
11 If I can explain. The dikes are there. My charge was  
12 to look at the effects and what was going on with those dikes  
13 in place. How they got there was none of my business.  
14 Q Well, how they got there was in part the Army Corps of  
15 Engineer's business, because the Army Corps of Engineers  
16 built portions of the dike after they had been damaged by  
17 flooding and disaster events, hasn't it?  
18 A They were brought back to the condition they were in prior to  
19 the -- to the failures, yes.  
20 Q By the Army Corps of Engineers, correct?  
21 A Yes.  
22 Q So to that extent, when you say you were not interested in  
23 it, you worked for the corps for how many years, sir?  
24 A Thirty years.  
25 Q You worked for 30 years, and during that entire time wasn't

1 PL99 available for the diking districts to repair their  
2 levees with federal money and with standards set forth and  
3 specifications set up by the Army Corps of Engineers?  
4 A Yes.  
5 Q So when you say it wasn't your business to know how the dikes  
6 got to the condition they were in, you knew, in fact, did  
7 have some knowledge with respect to that that wasn't  
8 explained yesterday to the jury, that the Army Corps of  
9 Engineers in fact rebuilt dikes along the Skagit River for  
10 the entire period that you were with the army corps; isn't  
11 that right?  
12 MR. HAGENS: Objection, Your Honor. I think there  
13 ought to be some more specifications as to what dikes he is  
14 talking about. He makes him sound like the Army Corps of  
15 Engineers built these dikes up.  
16 MR. SMART: That wasn't the question. They rebuilt  
17 the dikes.  
18 Q (By Mr. Smart) Isn't that right?  
19 MR. HAGENS: I think it ought to be specific.  
20 THE COURT: I agree.  
21 Q (By Mr. Smart) Isn't it true, sir, that the Army Corps of  
22 Engineers rebuilt Dike District 12 in 1980?  
23 A I don't know.  
24 Q Is that because your investigation into the history of the  
25 dikes did not extend to determining whether or not Dike

1 District 12 was rebuilt by the Army Corps of Engineers in  
2 1980?  
3 A I did not research that part.  
4 Q Was that outside the assignment that was given to you by the

5 plaintiffs in this case?  
6 A I would say it was, yes.  
7 Q Well, when -- you were with the corps in 1980, were you not?  
8 A Yes.  
9 Q Okay.

10 And do you recollect or misrecollect whether or not the  
11 dikes were repaired by the Army Corps of Engineers?

12 A I had nothing to do with repairs in dikes in 1980 in Dike  
13 District 12.

14 Q Would it be correct to say then that you just don't know how  
15 the dikes got to be in their, let's say, condition in 1981  
16 with respect to who built them, who put money into them?

17 A I have good understanding of how those dikes got there, yes.

18 Q Well, tell me how much money the Army Corps of Engineers  
19 spent on Dike Districts 12's dike.

20 A I have no idea.

21 Q Okay.

22 Well, you testified yesterday in response to Mr. Hagens'  
23 questions concerning various charts that you brought out  
24 that -- county records, that sort of thing. Did you ever  
25 investigate how much money the Army Corps of Engineers put

1 into the dikes?

2 A The Army Corps of Engineers never built those dikes.

3 Q They rebuilt the dikes in 1980, didn't they?

4 A That is not called rebuilding.

5 Q You have a different name for it?

6 A Bring them back to where they were. Small pieces of dike  
7 that failed in one manner or another were brought back to the  
8 condition that they were in prior to the failure. That is  
9 not considered building a dike.

10 Q So you say that when you're constructing a dike after it has  
11 been destroyed in a flood or damaged in a flood, that is not  
12 called building a dike; is that right?

13 A Not called building a dike.

14 Q Okay.

15 Who did build the dikes then, the diking districts?

16 A From my research of the history, it started out with the  
17 local farmers starting individual areas of protection for  
18 their own property and then grew into diking districts.  
19 Diking districts proceeded to build -- build them.

20 Q And the last major change to Dike District 12's dike in the  
21 building phase occurred in 1955, right?

22 A I would have to research my notes. A major portion of the  
23 diking district upstream from -- in fact, the whole dike --  
24 Dike District 12 upstream from Burlington Northern Railroad  
25 Bridge was moved. I guess you could call that built.

1 Rebuilt. Moved close to the river. And to the position it's  
2 in today.

3 Q Okay.  
4 In 1955, correct?  
5 A I believe that was the year, yes.  
6 Q And that was built by the diking districts and funded by the  
7 dike districts --  
8 MR. HAGENS: Object to the form. Lack of  
9 foundation.  
10 Are you saying the dike district alone did that,  
11 counsel? Is that your representation, implicit in the  
12 question?  
13 THE COURT: Well --  
14 MR. SMART: Isn't that correct? I don't know what  
15 that objection is.  
16 THE COURT: The objection initially was one of  
17 foundation.  
18 MR. HAGENS: Yes, it is foundation.  
19 MR. SMART: If he doesn't know, he certainly can  
20 say that.  
21 THE COURT: I'll overrule the objection at this  
22 point.  
23 Mr. Regan, do you know?  
24 A Bring up the question again, please.  
25 Q (By Mr Smart) Yes, sir.

1 Wasn't the dike built by the diking districts and funded  
2 60 percent by the dike district and 40 percent by the State  
3 in 1955?  
4 A I don't know the amount of funding, State or diking district.  
5 Q Is that because your investigation into the history of these  
6 diking districts did not include investigating who built the  
7 1955 extension of the dike and who funded it?  
8 A I could not find any record of it.  
9 Q What did you do to look?  
10 A What do you mean, what did I do to look?  
11 Q What did you do to look?  
12 A I went through all the records that were supplied to me.  
13 Q You mean supplied by Mr. Hagens?  
14 A Through the discovery.  
15 Q Well, those records upon which you based your deposition  
16 testimony and your earlier opinions were six records,  
17 correct?  
18 A Also states, and other material.  
19 Q Okay.  
20 So normally a person in your position, do they only just  
21 look at what counsel gives them or do they do any independent  
22 investigation?  
23 MR. HAGENS: Well --  
24 MR. SMART: Let me rephrase the question.  
25 Q (By Mr. Smart) Is it your standard practice, sir, in order

1 to formulate expert opinions and to research factual history  
2 on diking districts, to simply look at what the lawyer who  
3 hires you gives you, or do you do something independent, go  
4 outside of that?  
5 A We have gone up on the site, talked with people. I have no  
6 authority to go into anybody's records and say I want this, I  
7 want that. But I have talked to other people up there.  
8 Q Did you go down to the State of Washington to see if they had  
9 any public documents that you could review?  
10 A No.  
11 Q Did you go to the county to see if they have any public  
12 documents?  
13 A No.  
14 Q Do you go to any libraries to see if they have any public  
15 documents --  
16 A I think we found everything that could have been found in the  
17 library.  
18 Q Which library did you go to?  
19 A Corps of Engineer records and library.  
20 Q Did you to go Skagit County Library?  
21 A No.  
22 Q Did you go to King County Library?  
23 A I wouldn't have any reason to go to King County Library.  
24 Q Did you go any state library?  
25 A No.

1 Q You are familiar with the topography in the Nookachamps area,  
2 are you not, sir?  
3 A Yes.  
4 Q I would like to show you Exhibits 974 and 975, which are just  
5 two USGS topographical survey maps, are they not?  
6 A Yes.  
7 Q And you are familiar with these, are you not?  
8 A Yes.

9 (Defendant's Exhibit Nos. 974  
and 975 identified.)

10  
11 MR. SMART: I'd offer 974 and 975.  
12 MR. HAGENS: Can you tell me the date?  
13 Q (By Mr. Smart) Do you know when the last date was?  
14 A Unless it's on the title page on those documents, I have no  
15 idea when those surveys were done.  
16 MR. HAGENS: Is this -- being offered for  
17 illustrative purposes?  
18 MR. SMART: Yes.  
19 MR. HAGENS: No objection, Your Honor.  
20 MR. ANDERSON: No objection, Your Honor.  
21 THE COURT: They will be admitted for illustrative  
22 purposes.

23 (Defendant's Exhibit Nos. 974  
24 and 975 admitted into evidence.)

- 1 Q (By Mr. Smart) Regardless of the dates that the maps were  
2 created, sir, you would agree that the elevation -- the  
3 elevations shown on the map are the same as they have been  
4 for pretty much modern history. And I'm talking about the  
5 geological elevation, for instance, of Barney Lake and the  
6 banks of the Skagit River and things likes that.
- 7 A I would suspect that the Nookachamps area hasn't changed in  
8 recent history.
- 9 Q And you would agree that the elevation of Barney Lake is at  
10 eighteen feet, would you not?
- 11 A The maps show that?
- 12 Q Come on down and take a look.
- 13 THE COURT: You need to turn around. The jurors  
14 behind you are indicating they can't see it. You need to  
15 turn it way around.
- 16 MR. SMART: All right. Do it this way. Can  
17 everybody see all right?
- 18 A Barney Lake shows -- a number below the words "Barney Lake."  
19 It shows eighteen.
- 20 Q (By Mr Smart) That means eighteen feet above sea level  
21 correct?
- 22 A I'm not too sure. Over here in Clear Lake it says WL347.  
23 What does that mean? Maybe it means water level. It doesn't  
24 stay the same on Barney Lake. That doesn't appear to be  
25 reasonable. Maybe that is reasonable. It shows contour of
- 1 20 around it. That is a reasonable number for a water  
2 surface. It doesn't indicate it is the water surface.
- 3 Q (By Mr Smart) I guess what you are telling us it that even  
4 though you are a hydraulic engineer working for the Army  
5 Corps of Engineers and even though you consulted with the  
6 USGS data base and you are familiar with this map, you don't  
7 agree that the water surface for Barney Lake is eighteen feet  
8 above sea level?
- 9 A I can't get that from here. But I would say there is a good  
10 probability, a good probability that it is.
- 11 Q Do you have any reason to dispute that Barney Lake is at  
12 water surface elevation --
- 13 A At the time of the survey, if that is the -- at the time the  
14 surveys -- if that is the water surface elevation, that is  
15 what it was at the time of the surveys.
- 16 Q Did you ever go out and measure what the water surface  
17 elevation of Barney Lake was during normal nonflood  
18 conditions?
- 19 A I had no reason to.
- 20 Q So you have no reason to dispute it's at eighteen feet?
- 21 A I have no reason to dispute it. Appears reasonable.
- 22 Q When it's flooded, it's a lot higher?

23 A Yes.  
24 Q What is the elevation shown by the map of the bank of the  
25 Skagit River just west of the Highway 9 bridge?

1 A I see an elevation on the road -- Highway 9 road of 44.  
2 There is a contour line in there that is going to take.  
3 Q The road's going to be higher than the bank?  
4 A Yes, I believe would be higher.  
5 Q Let's take this location right here. What does that say?  
6 A Shows an elevation here --

7 THE COURT: I'm sorry, gentlemen. You need to  
8 speak up. This is being addressed to the jury, not to one  
9 another. That is -- what it sounds like, a conversation  
10 between the two of you. I can barely hear you.

11 A There is an elevation of 39 close to the river here.

12 Q (By Mr. Smart) That is on a dike?

13 A I don't believe there is any dike there.

14 Q No? What this is structure, then, here?

15 A Appears to be a road.

16 Q Okay.

17 So you think that the road then is at 39 feet?

18 A Road or something in that area is at 39 feet.

19 Q Did you ever investigate what the geological feature is?

20 A No. There would be no way of getting in there to determine  
21 if that 39 is correct or not without a survey crew. I know  
22 that road.

23 Q Did you ever survey the Nookachamps basin?

24 A I didn't personally survey it.

25 Q Did you have anybody survey where the banks of the river

1 were, what elevation they were?

2 A Not up in that area.

3 Q You can retake your seat, sir.

4 A (Witness complying.)

5 Q Now, you testified yesterday, sir, that the Skagit River  
6 began leaving its banks at 75 to 80,000 cubic feet per  
7 second. Was that your testimony?

8 A It depends where you are at, at a general number.

9 Q Isn't it true that in this area here, the Skagit River begins  
10 leaving its banks at, say, 65,000 cubic feet per second?

11 A At what? I didn't get the number.

12 Q This area right here at 65,000, or thereabouts?

13 A A good possibility starting in that area, is very low. That  
14 used to be the old channel to the river.

15 Q Even before it gets to 65,000 cubic feet per second in these  
16 old channels, the water starts to rise to match the water  
17 level in the river, correct?

18 A I believe so.

19 Q And flooding starts to extend out over the Nookachamps basin,  
20 correct?

21 A It would start. Yes.  
22 Q So even below 65,000 cubic feet per second, flooding starts  
23 in the Nookachamps, correct?  
24 A It could.  
25 Q Do you know if it does?

1 A 65,000 maybe is a good number. 75,000. It's in that  
2 neighborhood.  
3 Q Okay.  
4 And you learned this by your review of the historical  
5 records, correct?  
6 A Yes.  
7 Q And in fact, you did this while you were with the Army Corps  
8 of Engineers, correct?  
9 A Did what?  
10 Q Flood it.  
11 A Yeah. '75 it flooded, yes.  
12 Q And in fact, the Skagit River had -- well, the Skagit River  
13 has flooded in 1907, 1909, 1910, 1911, 1912, 1913, 1914,  
14 1915, 1916. In fact, you indicated in your testimony it  
15 floods approximately once every three years in the  
16 Nookachamps basin; is that right?  
17 A That's about right.  
18 Q Okay.  
19 Did you perform any analysis, sir, to determine what  
20 happens to structures in the Nookachamps during these floods  
21 that have taken place over time?  
22 A You have to explain do me what you mean by "what happens."  
23 Q Let's take, for instance, the 1906 flood. The barns floated  
24 away in the Sterling area in the 1906 flood?  
25 A I don't believe either one of us was here to recollect that.

1 Q Of course, I'm asking you, sir, based on your review of  
2 historical information.  
3 A There was nothing that I found in the historical information  
4 that said barns floated away.  
5 Q Did you review any newspapers from that era?  
6 A No, I did not.  
7 Q Okay.  
8 Is there some reason for that?  
9 A My examination didn't go that deep into newspaper review  
10 clippings.  
11 Q I'm just trying to get the parameters of what it was you did  
12 when you did your investigation to determine that you would  
13 testify as to the history of the Skagit River, the  
14 development of the levee system and its flooding.  
15 So I take it that it didn't include review of any  
16 newspapers back in, say, the 1896, 1906, 1921 era; is that  
17 correct?  
18 A No, I did not.

19 Q Review any photographs of any floods back in that era?  
20 A I have reviewed photographs in that era.  
21 Q Did you determine that water levels were high enough so that  
22 it inundated structures?  
23 A The photographs I saw were photographs in Burlington.  
24 Showing structures inundated.  
25 Q In order to have inundated structures in Burlington, the

1 water would have had to be high enough to get into  
2 Burlington.  
3 A Correct.  
4 Q What was the water surface elevation that you determined for  
5 those floods, let's say, in 1906? What was the water surface  
6 elevation in Burlington?  
7 A I have no idea.  
8 Q Is that because you didn't investigate it?  
9 A I -- true, I didn't investigate that.  
10 Q Did you investigate the water surface elevation on any of the  
11 plaintiffs' properties for any of the early floods?  
12 A 1975 flood. We went out and looked at a number of the  
13 plaintiffs' properties and observed high watermarks on their  
14 buildings. And we also observed high watermarks of the 1990  
15 flood.  
16 Q Okay.  
17 So the two floods that you studied were the 1975 flood  
18 and the 1990 flood?  
19 A That's correct.  
20 Q So you did not determine water surface elevation on any of  
21 the plaintiffs' properties for any flood earlier than 1975;  
22 is that correct?  
23 A There was no way of doing that.  
24 Q You testified yesterday, sir, in answer to Mr. Hagens'  
25 question, that you spoke with the Austins, correct?

1 A I spoke with the Austins, yes. I was in their house.  
2 Q The Austins lived through the 1951 flood, didn't they?  
3 A That's true.  
4 Q So you could have asked them how much water they had in their  
5 house during the 1951 flood, couldn't you?  
6 A I probably did. I don't remember asking them exactly. We  
7 were looking at 1975 flood and 1990 flood.  
8 Q So that when you represent to this jury and this Court that  
9 you are going to testify concerning the history of the Skagit  
10 River, the levee system, flood control and its impacts  
11 upstream and downstream through the history, really, that  
12 doesn't include asking any of the residents about what  
13 happened prior to 1975; is that correct?  
14 A Um, information prior to 1975 was discussed. We didn't take  
15 high watermarks on that. They would not be reliable if we  
16 did.

17 Q Your testimony that if the plaintiffs told you that they had  
18 high watermark in their house in 1951 of a certain level,  
19 that it wouldn't be reliable; is that your testimony, sir?  
20 A It probably would not.  
21 Q And that is -- can you make that determination without even  
22 testing out whatever the information was that the particular  
23 plaintiff would give you?  
24 A I can make that -- draw that conclusion from talking to the  
25 people over the years about flooding. It seems that flooding

1 gets deeper as time goes on. We found in my work in the  
2 Corps of Engineers things get worse as time goes on and  
3 become less and less reliable. Because your memory becomes  
4 less and less reliable.  
5 Q So even if they kept records of what the flood level was in  
6 their house in 1951, you would discount it because you would  
7 find their testimony in that regard to be unreliable?  
8 A If it was something like a nail driven in the wall or some  
9 hard evidence, that would be probably quite reliable. But if  
10 somebody coming out and saying, yeah, to the top of the third  
11 step, or an inch and a half on the floor or something like  
12 that, reliability seems, and the credibility seems, to go  
13 away with time.  
14 Q So I take it that in your review of the history of the Skagit  
15 River and its flooding and in the work that you did with the  
16 plaintiffs, you had a bias against reported information prior  
17 to 1975 and therefore you didn't consider -- didn't write it  
18 down, didn't test it; is that right?  
19 A I had no need to.  
20 Q Like you to step up, if you could, please, sir. Just so I  
21 can make sure that I get this information down correctly.  
22 Take a look at the screen, if you would please, sir.  
23 What I've got is --  
24 A I can't see it very good from here.  
25 Q Got a document -- it's just a blank chart I would like to

1 write down some information that you determine on. And it  
2 says Regan Flood Elevation for -- just picked three  
3 plaintiffs at random: Halverson, DeVries and Stakkelands.  
4 And picked various floods from 1815 to 1990. Do you see  
5 that?  
6 A Yes.  
7 Q All I want to do is record the information that you  
8 determined in your review of your history of the Skagit River  
9 and the work that you did for the plaintiffs.  
10 First all, did you determine whether Mr. Halverson's  
11 property was flooded in 1815, the big 400 --  
12 MR. HAGENS: In what?  
13 Q (By Mr. Smart) Did you determine whether Mr. Halverson's  
14 property would have been flooded in 1815 by the

15 400,000-cubic-foot-per-second flood that existed in that  
16 time?

17 MR. HAGENS: I'm going to object to this line of  
18 questioning. In fact, that question has been asked and  
19 answered, if I understand what the witness has testified so  
20 far. Object to the form of the question, Your Honor.

21 THE COURT: I don't know about -- The form of the  
22 question is fine.

23 MR. SMART: Maybe we illustrate the testimony a  
24 little better this way.

25 Q (By Mr. Smart) Showing you document 977, this is a map

1 identifying the plaintiffs' properties adjacent to the  
2 river. Do you agree that the properties are located in the  
3 positions shown by the document?

4 A The ones that I absolutely know -- I don't -- yes.

5 (Defendant's Exhibit No. 977  
identified.)

6  
7 MR. SMART: I would offer 977, Your Honor.

8 MR. HAGENS: Is it offered for illustrative?

9 Do you have to show it to the jury?

10 MR. SMART: They have already seen it.

11 MR. HAGENS: I know, but it hasn't been admitted  
12 yet, counsel.

13 MR. SMART: I know. But you stipulated we could  
14 show it to them.

15 MR. HAGENS: Yeah. I just want to see what it  
16 says.

17 Is the offer for illustrative purposes?

18 MR. SMART: Yeah. No. Right now.

19 MR. HAGENS: Illustrative purposes, for the moment,  
20 we have no objection.

21 THE COURT: It will enter 977.  
22 (Defendant's Exhibit No. 977  
admitted into evidence.)

23  
24 Q (By Mr. Smart) Okay. Now, Mr. Halverson's property is  
25 located in this purple area right here; is that correct?

1 A Um-hum.

2 Q Just so the jury can get an understanding of what happened  
3 over history, would you agree that in the big flood event,  
4 1815, 400,000 cubic foot per second, determined by the Army  
5 Corps of Engineers, as you testified earlier, Mr. Stewart and  
6 his report --

7 A Mr. Stewart was a U.S. Geological surveyor, nothing to do  
8 with the Corps of Engineers.

9 Q In his report, he reports to the  
10 400,000-cubic-foot-per-second flood that took place in the

11 Skagit in approximately 1815?  
12 A He reports a very large flood, which he characterizes it in  
13 that neighborhood, yes.  
14 Q You agree there was a very large flood back then?  
15 A According to his report.  
16 Q And you relied on his report in coming to your conclusions?  
17 A Definitely.  
18 Q In that flood in 1815, Mr. Halverson's property flooded?  
19 A I would say everybody in that picture, except up on the  
20 hills, everybody in that was flooded with 400,000 cfs.  
21 Q All of the plaintiffs' properties were flooded?  
22 A Yes.  
23 Q So we could put a "yes" up here for DeVries and Stakkelands  
24 and Halverson.  
25 Did you ever determine what the depth of the water was

1 in 1815 as a result of that large flood?  
2 A No, I didn't, and neither did Mr. Stewart.  
3 Q Okay.  
4 So I'll put in NK for not known.  
5 All right.  
6 In 1856 there was a flood approximately 300,000 cubic  
7 feet per second?  
8 A That's right.  
9 Q That has been reported by the USGS and the army corps?  
10 A The army corps did not report that.  
11 Q The Stewart report?  
12 A The Stewart report, yes.  
13 Q He was not?  
14 A He was not.  
15 Q The army corps has incorporated the information in the  
16 Stewart reports in their histories and their reports on the  
17 Skagit River?  
18 A That's correct.  
19 Q And they consider the Stewart report to be reliable, do they  
20 not?  
21 A I believe everyone does.  
22 Q And that includes you, correct?  
23 A Oh yes.  
24 Q So in that 300,000 cubic foot per second flood in 1856, were  
25 these properties all flooded?

1 A I believe everyone would have been flooded.  
2 Q So we can put a "yes" in again.  
3 Did you ever determine the depth?  
4 A No, and neither did Mr. Stewart.  
5 Q So again, it's not known. How about 1897? Flood in 1897 was  
6 109,000 cubic feet per second, according to the information  
7 that you referred to in your testimony yesterday, correct?  
8 A That's right.

9 Q All right.  
10 In fact, maybe it would help the jury if I put up the  
11 floods again. I would mark this chart.  
12 Showing you Exhibit No. 978, sir, sir, do you agree that  
13 this document is simply a blowup of the historical  
14 information that is contained in multiple reports, including  
15 the reports that you referred to yesterday in your testimony?  
16 A It appears to be. I can't attest to the exact numbers  
17 without checking each one.  
18 Q We can take the time to check, Your Honor. I copied it  
19 directly from the reports.  
20 A If you copied it directly from the report, I'll accept that.  
21 MR. HAGENS: What was the report?  
22 MR. SMART: From multiple reports, Carl.  
23 Concerning the historical information on floods. We've  
24 already been over this and stipulated to it.  
25 MR. HAGENS: Mind it being shown to the jury for

1 illustrative purposes.  
2 Q (By Mr. Smart) So your representation is this is based on  
3 court documents and other USG --  
4 A In fact, some of them are reported in the --  
5 MR. HAGENS: We have no objection to it.  
6 MR. ANDERSON: No objection, Your Honor.  
7 MR. SMART: Offer 978, Your Honor.  
8 THE COURT: 978 will enter.  
9 (Defendant's Exhibit No. 978  
identified and admitted into  
evidence.)

10 Q (By Mr. Smart) All right.  
11 Now, let me see if I can put this up here so the jury  
12 can see it. All right now.  
13 The flood of 1897, 190,000 cubic feet per second. Were  
14 the plaintiffs' properties all flooded by that flood?  
15 A I would suspect they were.  
16 Q We can put "yes" again for Halverson, DeVries and Stakkeland.  
17 And did you determine what the depth on any of their  
18 property was as a result of that flood in 1897?  
19 A No. No one else did, either.  
20 Q Not known. When you say "no one else did," I take it nobody  
21 that you know of; is that correct?  
22 A No record that I can find in the Corps of Engineers' records  
23 of high waters that came up with any records back that far.  
24 Q Okay.

1 Well, my question wasn't, sir, whether or not you  
2 discovered whether anybody else determined what the water  
3 depth was. My question was, did you --  
4 A No, I did not.  
5 Q Now, actually, what I have done is, I've done 1896. Would

6 the answer be the same for 1896 and 1897; they only different  
7 by 5,000 cubic feet per second?  
8 A I didn't quite understand what you said.  
9 Q Well, I made a mistake. When I filled out this chart, I  
10 asked you about 1897, I filled in 1896. And I apologize for  
11 that.  
12 A Okay.  
13 Q But you have two floods close together. 1896 was 185,000  
14 cubic feet per second, and 1897 it was 190,000 cubic feet per  
15 second. Would the properties have been flooded --  
16 A Basically the same floods, yes.  
17 Q We could say that Halverson, DeVries and Stakkelands were  
18 flooded in 1897. And again, that the depth was not known and  
19 not determined by you?  
20 A That's correct.  
21 MR. HAGENS: I think some foundation of whether  
22 there is any records by which to make the determination of  
23 flood depth back there. He keeps asking the witness that  
24 question, but he has not let the witness -- there is no  
25 foundation for whether the question can in fact be answered.

1 So I object to the question, Your Honor, as lacking  
2 foundation.  
3 MR. SMART: Come on, Mr. Hagens. Yesterday you had  
4 the witness testify that there was a difference in --  
5 THE COURT: No, counsel. No. I'll deal with the  
6 objection. I sustain the objection on the basis of  
7 foundation. I think he has tried to tell you a couple of  
8 times he doesn't have a foundation for that answer.  
9 MR. SMART: The question is --  
10 THE COURT: Counsel, I've sustained the objection  
11 on the bases of foundation.  
12 MR. SMART: Okay.  
13 Q (By Mr Smart) Mr. Regan, you apparently, in your analysis of  
14 this case, determined that the difference between modern  
15 conditions and conditions at some time in the past resulted  
16 in a two- to four-foot difference in water surface elevations  
17 as a result of the existence of the modern dike system, that  
18 sort of thing; is that correct?  
19 A For a given discharge.  
20 Q Right. For a given discharge.  
21 A Right.  
22 Q And you can do it for any discharge, correct?  
23 A You can do it -- you have to explain that a little bit to me.  
24 Q Your computer model, the variable discharge. You can plug in  
25 a different discharge and get a different elevation, correct?

1 A That's correct.  
2 Q That's the way your computer model works, right?  
3 A That's correct.

4 Q You make a set of assumptions concerning topography both in  
5 the modern times and way back when, then you plug in the  
6 different discharge and your computer model gives you the  
7 water surface elevation at various spots; is that correct?  
8 You can take any one of these -- and put in the computer  
9 model and determine a depth?  
10 MR. HAGENS: Objection to the form. Whether they  
11 have the data currently to be able -- I'll object to the form  
12 of the question.  
13 THE COURT: I think that was the question, whether  
14 or not there was. So I will overrule the objection.  
15 THE COURT: Restate the question.  
16 Q (By Mr. Smart) Could you take any one of these water  
17 surface -- excuse me -- those flow discharges, stick it into  
18 your computer model and you could get a water surface  
19 elevation for either with the dikes or without the dikes?  
20 A Only if you had the hydrograph that corresponds to those  
21 discharges, to these peak discharges. Because volume is a  
22 parameter. The volume of water is a parameter in computing.  
23 It's not just the peak. You can make approximations.  
24 Q That is what you did to get your before condition. In other  
25 words, you said that in the modern condition you have two to

1 four feet more water without any dikes or any modern  
2 improvements; isn't that correct. So you made some  
3 assumptions?  
4 A We looked at a specific flood, knowing the total  
5 characteristics of the flood.  
6 Q Okay.  
7 That was the 1975 flood, correct?  
8 A That's correct.  
9 Q And that formed the basis for your modern-day set of  
10 conditions for your computer model, correct?  
11 A That was one of the bases.  
12 Q And then with respect to the topography for the before  
13 condition, you just took out all the modern conditions?  
14 A Took out the levees.  
15 Q Took out the levees. Okay. So that you could get a water  
16 surface elevation taking out the levees by putting into your  
17 model any one of these discharges.  
18 MR. HAGENS: Object to the form. There were no  
19 levees, for instance, in some of these dates he is talking  
20 about, and they were a heck of a lot different condition than  
21 they are today. So that is lack of foundation, Your Honor.  
22 Object to the lack of foundation.  
23 MR. SMART: Exactly the point, Your Honor. That  
24 is, we're entitled to explore what the set of assumptions  
25 that were made for this computer model and whether or not the

1 witness has accurately set up the computer model to determine

2 the before conditions.

3 THE COURT: I don't disagree. You may proceed.

4 MR. SMART: Would you mind reading back the  
5 question?

6 (The question was read by the  
7 court reporter.)

8 A No, I can't.

9 Q (By Mr. Smart) So is it your testimony then that it is  
10 improbable to know what the water surface elevations were for  
11 the properties that I've indicated here, Halverson, DeVries  
12 and Stakkeland, for 1906, 1909, 1917, 1921, 1923, 1932, 1935,  
13 1940 and 1951?

14 A I believe it could be done. I think it would -- it entails  
15 getting the hydrograph of those floods. You just cannot take  
16 peak of the flood and compute out the water surface  
17 elevation. You got to know how much volume of water you are  
18 dealing with.

19 Q Would it be correct, sir, that did you not do it and  
20 therefore the answer to the question of what's the water  
21 surface elevation for all these properties is not known to  
22 you?

23 MR. HAGENS: Objection as to form. Has to be some  
24 foundation laid, Your Honor, whether it could be done.  
25 Asking whether or not he had done something without laying a

1 foundation as to whether it could be done, such as  
2 establishing that there were hydrographs of these various  
3 events is lacking in foundation.

4 THE COURT: That one question would be  
5 appropriate.

6 MR. SMART: Just asked him whether he knew it or  
7 not.

8 Q (By Mr. Smart) You don't not an answer?

9 A I don't even know the question right at the moment.

10 MR. SMART: I'll rephrase it. That's fair.

11 THE COURT: Actually, what I'm saying, counsel, is  
12 Mr. Hagens' proposed question makes sense to me at this  
13 point.

14 MR. SMART: That was the last question I asked him,  
15 would it be possible. And he said yes, with a hydrograph.

16 THE COURT: But then his follow-up question was --  
17 in order to lay the foundation for the ultimate question, you  
18 are asking him is -- I'll ask him.

19 Mr. Regan, are there hydrographs, to your knowledge,  
20 that exist for each of those flood events that have been  
21 asked about?

22 A The earlier ones, the big ones way back when, there is no  
23 hydrographs.

24 THE COURT: Way back when where? Obviously 1815  
25 there is no hydrograph.

1 A No, of course not.  
2 THE COURT: We know that. What ones are there?  
3 A There would hydrographs for the ones that the U.S. Geological  
4 Survey had a gauge in. And I would have to refer to my chart  
5 over here. Starting back about 1925.  
6 Q (By Mr Smart) Okay. So in -- 1932 onward, the answer is,  
7 you could have determined what the elevations were -- for  
8 those floods, corrects?  
9 A But that is -- that is history only at Concrete. It's very  
10 irrelevant to what is going on at the Nookachamps,  
11 Burlington, Mount Vernon area.  
12 Q Well, all these questions have to do with the Nookachamps,  
13 Mount Vernon, Burlington area, sir.  
14 A The record at Mount Vernon started in 1941.  
15 Q Okay.  
16 So you could then have determined what the flood  
17 elevation for the 1951 flood is, correct?  
18 A I believe that could have been done, yes.  
19 Q And you didn't do it, correct?  
20 A No.  
21 Q And for the others, on how -- it's your testimony you  
22 couldn't do it?  
23 A The other --  
24 Q The other floods, 1906 through 1940.  
25 A I don't believe there is enough information to do it, no.

1 Q So we can write in "not known" because you couldn't do it,  
2 right?  
3 A To be more accurate, write in "not enough information to do  
4 it." It could be done if the information was available.  
5 Q Okay.  
6 But the information isn't available, and therefore the  
7 answer is not known, correct?  
8 A Okay.  
9 Q Isn't that right?  
10 A I believe so, yes.  
11 Q Okay.  
12 Now, even though you can't tell what the depth of the  
13 water would be on those properties, do you agree that the  
14 plaintiffs' properties would have flooded because of the size  
15 of the flood in 1906?  
16 A Which was ...  
17 Q 1906 was 180,000 cubic feet per second.  
18 A Yes.  
19 Q And how about 1909? Well, that was a big one, 220,000 cubic  
20 feet per second. It certainly would have flooded then,  
21 right?  
22 A That's correct.  
23 Q And how about 1917 with a flow of 195,000 cubic feet per  
24 second? They would have flooded then as well?

25 A 195, you say?

1 Q Yes.

2 A Yes.

3 Q And in 1921, they would have flooded with a flow of 210,000  
4 cubic feet per second, would they not?

5 A Oh sure.

6 Q And in 1932 with a flow of 157,000 cubic feet per second, do  
7 you know whether they would have flooded then or not?

8 A Definitely, it would flood.

9 Q Okay.

10 A What year did you say that was now?

11 Q 1932.

12 A Yeah.

13 Q 1935 in here, but it doesn't appear in my chart, so I must  
14 have made another mistake. So I will put a line through that  
15 one.

16 All right. Let's go to 1951. How about 1951, with a  
17 flow of 150,000 cubic feet per second. Did the plaintiffs'  
18 properties flood then?

19 A I would say it did. Now, on the Burlington side there was  
20 levees involved and some of the property over there that  
21 would be behind levees that didn't. But generally speaking,  
22 1951 flood would have flooded.

23 Q But the plaintiffs --

24 A Basically, everybody there.

25 Q Okay.

1 And again, the depth is not known because you didn't  
2 compute that, despite the fact that there was a hydrograph in  
3 existence?

4 A That's correct, yeah.

5 Q That could have been used.

6 A Um-hum.

7 Q In 1975, now 1975 was the flood from which you took your  
8 hydrologic and your topographic information to form the  
9 computer model, correct?

10 A The topographic information is the same. I mean, that has  
11 nothing do with the flood, of course,.

12 Q Topography is the same between 1990 and 1975, for your  
13 purposes?

14 A For all practical purposes.

15 Q Okay.

16 In other words, any variations would be so slight as to  
17 not make any difference in terms of your study; is that  
18 right?

19 A That's correct, yes.

20 Q Okay. And what really has changed then in your assumptions  
21 concerning the computer model is the flow of water, correct?

22 A Two different flows of water, yes.

23 Q Right. Okay, in 1979 there was a bigger flow, 152,000 cubic  
24 feet per second, and in 1975 it was more like 130,000 cubic  
25 feet per second, correct?

1 A Those are approximate numbers.

2 Q And those are the numbers you used; isn't that right?

3 A Yes.

4 Q For the development of your computer model.

5 A Right.

6 Q Now, let's do it this way.

7 THE CLERK: Exhibit 979 marked. Exhibit 980

8 marked.

9 Q (By Mr. Smart) I'd like to show you Exhibit No. 979. Sir,  
10 it's also Exhibit 4G to your deposition, if that refreshes  
11 your recollection of anything. Can you identify that for me,  
12 sir?

13 A This is a preliminary output from -- one of the outputs from  
14 our computer model for a discharge of 150,000, calibrated for  
15 11-25-1990 flood.

16 Q Okay. And can you identify Exhibit No. 980?

17 A It's the same thing, except for the 1975 flood. And  
18 recognizing these are preliminary outputs.

19 Q Well, those were the results of your computer model that  
20 existed on the date of your deposition, which was October  
21 10th of 1995, correct?

22 A Fifteen months ago.

23 (Defendant's Exhibit Nos 979 and  
24 980 identified.)

25 Q (By Mr. Smart) All right.

1 Okay. And so Exhibit 979 for a flow of 150,000 had  
2 cubic feet per second trying to simulate the November 1990  
3 flood, and No. 980 is the flow of 130,000 cubic feet per  
4 second trying to simulate the 1975 flood; is that correct?

5 MR. HAGENS: Objection, Your Honor. He said  
6 preliminary. That is a mischaracterization of the witness'  
7 testimony.

8 MR. SMART: With that qualification.

9 THE COURT: With that qualification.

10 A You have to go back through that. I lost my train of  
11 thought.

12 Q (By Mr. Smart) Isn't 980 for the 1975 flood of 130,000, and  
13 979 for the 1990 flood of 150,000?

14 A That's right.

15 MR. SMART: Offer --

16 MR. HAGENS: These are preliminary reports.

17 A These are preliminary at the time that we gave the  
18 deposition, yes.

19 MR. HAGENS: No objection, Your Honor.

20 MR. ANDERSON: No objection.  
21 MR. SMART: Offered, Your Honor.  
22 THE COURT: They will be admitted.  
23 (Defendant's Exhibit Nos. 979  
and 980 admitted into evidence.)

24  
25

1 Q (By Mr Smart) I would like you to have these exhibits, if  
2 you would, please. And I'll put a copy -- 130 is 980; is  
3 that correct?  
4 A Um-hum.  
5 Q Now, let's put this on the screen here so the jury can see  
6 it. Is that in focus for everybody?  
7 Now, this document says "Skagit/Nookachamps Initial  
8 Calibration for 11/25/90." Q is the flow?  
9 A The peak discharge.  
10 Q Did I understand correctly what you did is kind of digitized  
11 or assigned numerical values for the topographic information  
12 that you got off USGS topography maps and other data bases?  
13 A That's correct.  
14 Q And then you inputted that into the computer in a fashion  
15 that roughly gave you a numerical outline of what the  
16 Nookachamps basin, this low area, was like so that you could  
17 try to numerically simulate what is shown here on the USGS  
18 map; is that right?  
19 MR. HAGENS: Objection to the form. He called it a  
20 low area when there has been no foundation the Nookachamps,  
21 for instance, is lower than Mount Vernon.  
22 THE COURT: I'll sustain that objection.  
23 MR. SMART: Let's establish that.  
24 Q (By Mr Smart) The Nookachamps is a natural basin, is it not,  
25 sir?

1 A It's part of the floodway.  
2 Q It's a natural basin, is did not, sir?  
3 A I don't know. You have to explain to me what you mean by  
4 "natural basin".  
5 Q It's a natural storage area, because it's a low-lying area  
6 that fills up with water when the Skagit River floods; would  
7 you agree with that?  
8 A Fills up with water when the Skagit River floods, yes.  
9 Q And it's call the Nookachamps basin. In fact, you referred  
10 to that yesterday in your testimony, did you not?  
11 A I may have used that term.  
12 Q And "basin" is kind of a common term that everybody --  
13 A Kind of like a bath tub. That is a basin.  
14 Q And you would agree that that is what is shown by these white  
15 areas in here; that is, they are much lower than the  
16 surrounding hills. In fact, Barney Lake is even much lower

17 than the river back by some 21 feet.  
18 A The white area doesn't mean it's a low area. It means  
19 it's -- the green area is more of a vegetated area and the  
20 white unvegetated by trees. That is --  
21 Q There is no timber in here because it all floods out in times  
22 of flood.  
23 MR. HAGENS: Objection for lack of foundation.  
24 A Also a lot of other white areas on there, too, that don't get  
25 flooded.

1 Q (By Mr. Smart) Let's not talk about the other ones. I don't  
2 mean to argue with you.  
3 Wouldn't you agree that the Nookachamps basin is a  
4 low-lying area, relative to the rest of the surrounding hills  
5 here? You can tell that by the contour maps.  
6 MR. HAGENS: Objection to the form of the  
7 question. Low-lying in comparison to what?  
8 THE COURT: The question contained its own  
9 definition. I think the question was low lying in comparison  
10 to the surrounding hills and adjacent areas.  
11 A Lower than the surrounding hills, definitely.  
12 Q (By Mr Smart) And the low point at Barney Lake is 21 feet  
13 lower than the riverbank, as you testified in your earlier  
14 testimony.  
15 A The difference in the elevation of what we pointed out, yes.  
16 Q Good. I think now we have established, sir, that what you  
17 are trying to do by this diagram here is to numerically input  
18 the topographic information that you get of ever this map.  
19 A That's true, but not just for the Nookachamps region.  
20 Q Oh no. Yours extended down to, what, about here, and up to  
21 the Highway 9 bridge.  
22 A And on the other side of the river also.  
23 Q For the various parameters of the model you've done what I  
24 suggested, which is to try to ascribe numerical values to the  
25 topographical information?

1 A That's true. We make a simulation, a numerical simulation of  
2 the topographical features.  
3 Q Good. And then once you have done that, you operate the  
4 computer model by changing the flow, and that gives you for  
5 the various different sections that are identified in 980.  
6 For instance, the one we're looking at of water surface  
7 elevation, correct?  
8 A Changing the flow, the total flow, the total volume, yes.  
9 Q And if you get more flow in the model, you get a higher  
10 elevation, right?  
11 A That would not necessarily be true.  
12 Q True in your model, isn't it?  
13 A Not necessarily. It may well be.  
14 Q Then you would expect that, wouldn't you? I mean, normally

15 it's kind of common sense, if you get more water, then you  
16 get a higher water surface elevation.  
17 A There are two things that can go on. You can have a very  
18 rapid flood through the valley with a very high peak but very  
19 little volume. That is one flood. You could have another  
20 flood with a lower peak with a bigger volume which may end up  
21 giving you the same elevation of water.  
22 Q Okay.  
23 But all things being equal and assuming that the  
24 hydrographs and the runoffs follow some relatively constant  
25 pattern, you would expect with that a greater discharge you

1 will have a higher elevation, correct?  
2 A Generally speaking, that is correct.  
3 Q Okay.  
4 And that is what is shown by your model, because in your  
5 model you have higher elevation for 150,000 cubic feet per  
6 second discharge than you do for 130,000 cubic foot per  
7 second.  
8 A Right.  
9 Q And let's -- if we could talk about this diagram just in a  
10 little more detail.  
11 If I understand, the way you put this model together,  
12 you actually took the reported water surface elevations  
13 during the 1975 flood and you used those as data points for  
14 the purpose of figuring out how high the water was at the  
15 peak in certain areas; is that correct?  
16 A That's what these sheets are. These are the calibration  
17 runs.  
18 Q Right. For instance, bear with me if you would, please, sir.  
19 This number of 39.4 which is handwritten in on the  
20 diagram is a number that was actually reported by one of the  
21 individuals who lived there, correct?  
22 A And surveyed --  
23 Q Isn't that correct?  
24 A That's correct. It's a surveyed elevation. It was reported  
25 -- it was taken from high watermarks that we observed and a

1 surveyor went out and surveyed.  
2 Q Okay.  
3 But what the surveyor surveyed wasn't the water, because  
4 the water had gone away. What he surveyed was the mark at  
5 which the witness, in this case, one of the plaintiffs, told  
6 him the water had risen to.  
7 A You could see it.  
8 Q In 1975, correct?  
9 A You could actually see indications that that happened.  
10 Q Okay.  
11 So when you had a report that the water surface  
12 elevation came up to a certain level in 1975, you had a

13 surveyor go out there and shoot a level and figure out how  
14 high it was above sea level?  
15 A That's correct.  
16 Q And that's what these number are?  
17 A The ones written in by hand, yes.  
18 Q So I'm going to mark those ones that are written in by hand.  
19 Did I get them all?  
20 A Had around twelve of them.  
21 Q We agree. Okay.  
22 Twelve. And then you did the same thing for -- Before  
23 we do that -- how about these other numbers, the ones that I  
24 haven't highlighted?  
25 A Those are the computer-generated numbers.

1 Q Okay.  
2 So in order to develop one of these computer-generated  
3 models, you have to have the historical information about  
4 what the actual high water level was, and you use those data  
5 points as a basis for developing the model. And then the  
6 rest of the model is developed by the computer, based on the  
7 topographical assumptions and the assumptions concerning that  
8 that you inputted into the model, correct?  
9 A Well, the computer doesn't generate -- the model -- have your  
10 terminology wrong.  
11 Q Let me rephrase it then, because I want to understand it and  
12 I want the jury to understand it.  
13 It was my understanding that you made a model using the  
14 topographical information; that is, one set of parameters.  
15 A That's correct.  
16 Q And then you actually surveyed actual high watermarks, which  
17 I've got identified here in the yellow numbers.  
18 A That's correct.  
19 Q And then based on the topographical information that you put  
20 into the computer model and given these data points which  
21 were calibrated with the model, you actually generated these  
22 other numbers which showed water surface elevations, okay, as  
23 a result of the operation of the model, right?  
24 A The model included other things other than the water and the  
25 topography. Some hydraulic characteristics have to be

1 supplied to the model.  
2 Q Sure. You got the hydrograph --  
3 A No, that is the water.  
4 Q That is just the water surface?  
5 A Right. You've got -- if you want me to explain a little  
6 bit.  
7 You've got to input to the model -- you've got to put in  
8 friction. In other words, friction of the water running over  
9 on the ground. You've got to get that characteristic. There  
10 are other characteristics, such as expansion and contraction,

11 eddy losses. Those have to be part of the model. And then  
12 from that model, then you impose this hydrograph on it.  
13 Q The topographic?  
14 A No. You get the hydraulic characteristics of the system,  
15 then you impose the hydrograph on that -- onto the model, and  
16 it comes back and gives you water surface elevations.  
17 Q Okay.  
18 So you got more parameters than just topography and  
19 water flow, and you know what they are because you are the  
20 expert and you put them in there and then you run the model  
21 and get these other numbers here, which show water surface  
22 elevations?  
23 A Those are the waters that come back from the computation  
24 going on in the model.  
25 Q But you can't have an accurate model without first inputting

1 the actual numbers that were observed water levels by the  
2 people, by the surveyors, that were on the side of a barn,  
3 for instance. That is what you started with, right?  
4 A Those are not inputted into the model.  
5 Q Oh. They are not?  
6 A No, they are not inputted. That is why you see them written  
7 in pencil on here. The model comes out with a data that you  
8 see printed out here. And it's checked against these  
9 elevations that we surveyed.  
10 Q I see. So that if the model number, the one that is not  
11 highlighted, is different than the one that is actually  
12 identified by a survey mark, then there is some error to one  
13 degree or another in the model?  
14 A Something going on there, right. Either in the model or in  
15 the high watermark.  
16 Q You're assuming that the high watermarks are accurate because  
17 that is what the individuals say they are, and you could see  
18 it on the side of the building, right?  
19 A That's right.  
20 Q The people who live through the flood know where the high  
21 watermark was?  
22 A Definitely.  
23 Q Let's take 39.31. That data point is right next to a water  
24 surface elevation shown by your computer model of 39.75?  
25 A That's correct.

1 Q So, your model is off by about half a foot there, right?  
2 A That's correct.  
3 Q And that would also be true -- well, look over here on this.  
4 Your model is right in this area. Right next to a 40-foot  
5 area. So I take it then that by this process of checking  
6 what the model comes up with versus the actual surveyed  
7 elevation, you can jigger around, adjust it a bit, to make  
8 sure that it comes up with the right answer.

9 A That is the procedure you use for calibration. You do some  
10 adjusting within limits. You can't go outside of some  
11 limits. You know what is right and wrong in the input data.  
12 You do have limits on it.

13 THE COURT: Counsel, excuse me. Speaking of what  
14 is right and wrong, it's right to take a break at this point.  
15 So we'll do that. And we'll reconvene in fifteen minutes  
16 then.

17 (Morning recess was taken.)  
18 RICHARD P. REGAN, called as a witness by the  
19 plaintiff, being previously  
duly sworn on oath, testified  
further as follows:

20

21

CROSS-EXAMINATION

22 BY MR. SMART:

23 Q Mr. Regan, let's turn back again to Exhibit 980, if we could,  
24 please.

25 A Okay.

1 Q Now, this, again, 980 is the computerized model that you  
2 generated for the 1975 flood, correct?

3 A That's correct.

4 Q And did Mr. Halverson's property flood in the 1975 flood?

5 A It didn't appear to.

6 Q You saying it didn't?

7 A I can't relate this to that too well.

8 Q Did you investigate to determine whether or not Mr.  
9 Halverson's property flooded in 1975?

10 A I believe it did, yes, yeah. Now I'm looking at the two, I  
11 can see that it did, yes.

12 Q Just a minute ago I thought you said it didn't.

13 A I didn't say that. I said I couldn't tell from just  
14 comparing the two across here.

15 Q All right.

16 Let's try to get some range of relativity here.  
17 Mr. Halverson's property is here?

18 A That's correct.

19 Q And based on your computerized model of the 1975 flood, it  
20 appears to have flooded, correct?

21 A Appears to in this region here, yes.

22 Q Right about where the 40-foot mark is?

23 A I believe that is fair to say.

24 Q So going back to our -- our 981 illustrative matter here,  
25 Halverson would have flooded in 1975 and the water surface

1 elevation determined by your computer model would have been  
2 roughly 40 feet, right?

3 A That's right.

4 Q And then how about Miss DeVries' property here, this one here

5 on Francis Road and Thilberg Road. That's the big yellow  
6 square.  
7 Q Right?  
8 A Um-hum.  
9 THE COURT: Just for my edification. I'm sure that  
10 the jury probably can track it every bit as well as I am.  
11 When we say "water surface elevation of 40 feet" we're  
12 talking about the elevation of the top of the water surface  
13 above sea level.  
14 MR. SMART: Yes, above sea level. At the peak of  
15 the flood.  
16 A That's correct.  
17 THE COURT: We're not talking about 40 feet of  
18 water on anyone's property.  
19 MR. SMART: No. We're talking about 40 feet above  
20 sea level. That is the water surface elevation measured  
21 above sea level.  
22 A That's correct.  
23 THE COURT: That's the kind with the USGS survey  
24 maps that we show those elevation levels.  
25 MR. SMART: Sure.

1 Q (By Mr Smart) And you made an attempt to coordinate your  
2 elevation with the USGS --  
3 A The gauges -- Mount Vernon gauge is at basically sea level,  
4 zero the gauge. The other gauges are not.  
5 Q But in any event, you adjusted for all that so that when you  
6 give an elevation, that is above sea level?  
7 A Definitely, yes. That's what these are --  
8 THE COURT: I just wanted to make sure that there  
9 was no confusion in anyone's mind that we're talking about  
10 water depth as opposed to surface elevation as measured  
11 against sea level.  
12 MR. SMART: I think it's a good idea.  
13 A Um-hum.  
14 Q (By Mr Smart) All right.  
15 Now, would you agree that Miss DeVries' property would  
16 be roughly in this area right here, near this 39.4?  
17 A It's -- it is in the 39 area, yes.  
18 Q So we just say 39 to 49 feet?  
19 A Not to 49, feet.  
20 Q I'm sorry. 39 to 40.  
21 A In that neighborhood, yes.  
22 Q Okay.  
23 So that property would have flooded as well in 1975, and  
24 it would have been 39 to 40 feet, approximately?  
25 A Approximately.

1 Q And then how about Mr. Stakkeland's property? Mr.  
2 Stakkeland's property is over here on Clear Lake.

3           Almost had a disaster.  
4           Do you see that, sir? I'll point it out to the jury in  
5 a second.  
6 A       Okay.  
7 Q       Stakkeland over here on Clear Lake? Right there.  
8           Okay. Did his property flood in 1975?  
9 A       Looking at this, correlating it to his location, it appears  
10 it could have. It would at around elevation 40.  
11 Q       So probably yes?  
12 A       Probably, yes.  
13 Q       Yes. And again, the depth is not known, correct? No. You  
14 just said 40.  
15 A       Approximately 40, yes.  
16 Q       40.  
17 A       That's out on the fringe of the model.  
18 Q       Just so the jury understands -- none of these models are  
19 precisely accurate, are they?  
20 A       Definitely. Like to bring that up. They are not precisely  
21 accurate.  
22 Q       And in fact, there are a lot of variables that you might not  
23 have even thought about that could come into play into a  
24 complicated topographic situation like the Skagit River.  
25 A       We like to think we're got all the major parameters in the

1 model there. Maybe some minor parameters.  
2 Q       All right.  
3           But as indicated, you are going to run across some  
4 variation, for instance, in this case right here, say, half a  
5 foot?  
6 A       That's correct.  
7 Q       And you would expect that, wouldn't you?  
8 A       I would expect the model to be accurate within plus or minus  
9 a half a foot, yes.  
10 Q       All right.  
11           Now, let's go to -- you got 979 there?  
12 A       Correct.  
13 Q       All right.  
14           979 is your computer model description -- Let's go the  
15 other way -- for the 1990 flood, correct?  
16 A       Right.  
17 Q       Also, similar to 980, do we also have some actual observed  
18 water surface elevations?  
19 A       Basically, the same -- same number. A few different ones.  
20 Q       Okay.  
21           But again, they are handwritten in on the diagram?  
22 A       That's correct. They are all handwritten in.  
23 Q       All right.  
24           So these are actually observed water surface elevations  
25 during the 1990 flood. And have you -- I'll count them up

1 here in a second -- nine of them for 1990; is that correct?.

2 Woops. Ten.

3 A Yeah.

4 Q All right?

5 A I believe that is right, yes.

6 Q And these elevations -- Incidentally, what I would like to

7 do -- I'm going to make these, if we could, Your Honor, 979A

8 and 980A because what I would like to do is have marked in on

9 these documents, just for illustrative purposes, where the

10 bridges are, so that we can show those. So if I could do

11 that and mark these -- I think it will be helpful later on.

12 THE COURT: Counsel?

13 MR. HAGENS: I'm not sure exactly what he is

14 doing. He has two -- you have some new exhibits, counsel?

15 Is that what you are --

16 Q (By Mr Smart) What I'll do is hand you, sir, these copies of

17 979 and 980, which have been marked 979A and 980A. And do we

18 have a red pen?

19 There are two bridges that sort of operate as the upper

20 and lower ends of the Nookachamps area. There is the

21 Burlington Northern bridge and there is the Highway 9 bridge

22 at Sedro Woolley. You are familiar with those, correct?

23 A Yes.

24 Q And actually, there are other bridges downstream, the Highway

25 99 bridge and the I-5 bridge?

1 A That's correct.

2 Q Would you mark in on 979A and 980A the location of those

3 bridges?

4 A Okay. All four of them?

5 Q Yeah. Well, if you can.

6 MR. HAGENS: If I might have an objection.

7 Yesterday we asked to mark up exhibits and counsel objected.

8 But now apparently he wants to. And some extent I think if

9 I'm going to not be allowed to mark or emphasize certain

10 points of exhibits, I don't think that perhaps counsel should

11 be entitled to do that.

12 MR. SMART: Well, Your Honor, the objection

13 yesterday was that the witness was asked to mark a document

14 after it had been admitted into evidence.

15 MR. HAGENS: These are admitted into evidence.

16 MR. SMART: No.

17 THE COURT: These are new exhibits. We're actually

18 sort of creating an exhibit as we're going along here.

19 Overruled.

20 Q (By Mr. Smart) if you would indicate where the bridges are,

21 please.

22 A (Witness complying.) There is going to be a little

23 speculative downstream here.

24 Q (By Mr Smart) All right. And if you will label all the

25 bridges, that would be very helpful, please.

1 A (Witness complying.) Want that on both?  
2 Q Yes, please.  
3 A Get fairly close.  
4 Q Okay.  
5 Now, just so we can show this to the jury, what you have  
6 done so far, you have placed on 979A and 980A the location of  
7 the I-5, 99 and the Burlington Northern bridges. In fact, it  
8 would be easier if I turn it around like this because that is  
9 downstream. And also upstream the Highway 99?  
10 A Highway 9.  
11 Q You're right. Upstream the Highway 9 bridge. And you have  
12 done that for both diagrams?  
13 A Um-hum.  
14 Q If you would, please, sir, could you give us also next to  
15 each bridge the closest -- what your diagram -- your computer  
16 model shows is the water surface elevation for each flood at  
17 the location of those bridges. Just write that on the  
18 document?  
19 A (Witness complying.)  
20 Q Great.  
21 A Relatively close.  
22 MR. SMART: Sally, are 979 and 980 admitted?  
23 I will offer 979A and 980A for comparison purposes with  
24 979 and 980.  
25 MR. HAGENS: No objection.

1 MR. ANDERSON: No objection.  
2 THE COURT: All right.  
3 (Defendant's Exhibit Nos. 979A  
4 and 980A identified and admitted  
5 into evidence.)  
6 Q (By Mr Smart) On 979, which is, again, the 1990 flood, you  
7 have -- oh is the elevation at the Highway 9 bridge that is  
8 shown by your --  
9 A Forty-five.  
10 Q Forty-five feet. That is above sea level, correct?  
11 A That's correct.  
12 Q And then for 980, same location would be ...  
13 A Oh, okay. Forty-four feet.  
14 Q Forty-four feet. And then downstream in the 1990 flood you  
15 have an elevation of 37 feet at the Burlington Northern  
16 bridge; is that correct?  
17 A That's correct .  
18 MR. ANDERSON: Excuse me, counsel. Which exhibit  
19 was that?  
20 MR. SMART: That was 979A.  
21 Q (By Mr. Smart) And then downstream at the Burlington  
22 Northern bridge in the 1975 flood you have an elevation of 36  
23 feet, correct?  
24 A That's right.

24 Q All right.  
25 Thank you.

1 I think we can put these aside for a moment.  
2 Now, we have one more thing to do with respect to 981  
3 here. And that is to talk about the -- I think actually you  
4 are going to need these again. I'm sorry.

5 Talk about the water depth, the water surface elevation  
6 at the Halverson property in 1990. Now, I presume all of  
7 these properties flooded because otherwise the plaintiffs  
8 wouldn't be here seeking compensation from the government.

9 A I would have to assume that.

10 Q Did you ever check that out to verify that they flooded?

11 A I have not checked every single person, no.

12 Q How about the Halverson property? Do you know whether that  
13 flooded?

14 A I've been on Halversons' property.

15 Q Do you know whether they were flooded if 1990?

16 A Yes, I do.

17 Q So we put in "yes" there. All right. What was the water  
18 surface elevation?

19 A For 1990?

20 Q For 1990.

21 A Around 41 feet.

22 Q Forty-one feet. Okay.

23 And for the DeVries' property? That flooded, correct?

24 A Oh yes, that flooded, correct. About 40.75, 40.7. Something  
25 on that order.

1 Q 40.7. And then for the Stakkeland property?

2 A You have to refresh my memory again.

3 Q Okay.

4 Stakkeland is in Clear Lake right there.

5 A A high 41 or a 42.

6 Q So 41 to 42 then?

7 A 41.7. Something like that.

8 Q 41.7. Okay.

9 MR. SMART: That completes 981, and I would offer  
10 that for illustrative purposes.

11 MR. HAGENS: We object. It's grossly  
12 misrepresentative. There are only three plaintiffs on this,  
13 Your Honor. So he has taken the three plaintiffs he knows  
14 suffered flooding in '75 and '90 and suggesting to the jury  
15 and everybody else that this is representative of everybody's  
16 situation.

17 MR. SMART: Only purports to represent those three  
18 plaintiffs, Your Honor. Each plaintiff has a separate case  
19 in this case.

20 MR. HAGENS: Your Honor, that is not the purpose of  
21 this exhibit. It focuses on three plaintiffs --

22 THE COURT: That doesn't go to its admissibility.  
23 MR. HAGENS: It certainly goes to whether it's  
24 misleading. That is my objection. It is grossly  
25 misleading. Put on three plaintiffs and showing a fragment

1 of the picture, to the exclusion of everybody else, Your  
2 Honor.

3 THE COURT: With that objection, I'll admit it.  
4 (Defendant's Exhibit No. 981  
5 identified and admitted into  
6 evidence.)

7 MR. SMART: Thank you, Your Honor.

8 Q (By Mr. Smart) Judge Hulbert raised a good point earlier  
9 with respect to this question of water surface elevation.  
10 Did you go out and compute the depth of the water in the 1975  
11 flood on any of these properties?

12 A You don't compute depth.

13 Q You didn't do that?

14 A You can go back in, take the water surface elevation, compare  
15 it to the topographic information and come up with the depth,  
16 yes.

17 Q Did you do that?

18 A In some cases I did, yes.

19 Q And written a report or anything has that information in it?

20 A No, no, no.

21 Q Okay. All right.

22 Did you do it in 1990?

23 A Basically the same, except about a foot deeper.

24 Q Did you ever provide a specific depth for each property of  
25 the water at any location?

A I did not.

1 Q You didn't do that. Okay.

2 All right. Now, as I understand, the way you created  
3 this model that is shown in the various 979 and 980  
4 diagrams, you did that by the 1975 flood, taking the program  
5 materials we earlier, talked about, constructing the computer  
6 model. And then in order to generate this difference of  
7 between two and four feet of extra water, you compared it to  
8 a preexisting condition without levees; is that correct?

9 A Took the exact topographic information that we had in the  
10 computer model and took out the levee feature.

11 Q And the goal to that was to compare the modern situation in  
12 1975 and 1990 and the topographic information that you had  
13 there, which you said was equivalent, with a time back some  
14 long time ago to see what the effect of the levees would have  
15 on the water levels in the Nookachamps; is that right?

16 MR. HAGENS: Object to the form of the question.  
17 Has to be some definition of "long time ago." What other  
18 civil structures were like in the floodplain, Your Honor.

19 MR. SMART: I'm certainly going to get to that.  
20 MR. HAGENS: Object to the form of the question.  
21 MR. SMART: Just asking.  
22 MR. HAGENS: Lack of foundation Your Honor.  
23 THE COURT: Sustain the objection.  
24 Q (By Mr. Smart) What was the purpose of the model? Isn't  
25 that the purpose, is to compare the modern situation with the

1 situation that existed some time in the past?  
2 A No.  
3 Q Did you ever compare the modern situation with some real  
4 situation that existed at some time past?  
5 A The model compared existing situation to the condition  
6 existing without the levees, only the levees.  
7 Q Okay.  
8 So really, you have never examined then what the water  
9 surface elevations would be for the plaintiffs' properties,  
10 given topographical information such as you used in the 1975  
11 and 1990 situation but taking that information from an  
12 earlier period in history, have you?  
13 A I don't understand your question.  
14 Q Well, let's go through it again then.  
15 In order to prepare your model, sir, you took  
16 topographical information off a modern topographical map and  
17 constructed a computer model?  
18 A Basically, that map plus some other information.  
19 Q Okay.  
20 And you used that to create a modern situation  
21 representing the 1975 and 1990 floods?  
22 A That's correct.  
23 Q But what you didn't do is, you didn't go back and take  
24 topographical information from a period in history for these  
25 earlier floods, let's say back in 1909 or 1921, or even 1896,

1 and say, What was the topographical information there, and  
2 put it into a computer?  
3 A It wasn't necessary.  
4 Q You didn't you do it, right?  
5 A We didn't do it. We didn't need to do it.  
6 Q And in fact, the only thing that you've done in your computer  
7 model is you have taken out the numerical information that  
8 represents the topographical assumptions that you made about  
9 the levees, correct?  
10 A That's correct.  
11 Q Okay.  
12 So for instance, in the before condition that you said  
13 in your computer model represents the without-levee  
14 situation, you didn't even take out the Ross Dam, did you?  
15 MR. HAGENS: Object to form of the question.  
16 Established whether the model even goes up that high, Your

17 Honor. So I object to the form of the question.  
18 THE COURT: Sustained.  
19 Q (By Mr. Smart) Okay.  
20 Is there any topographical information that you took out  
21 other than the levees?  
22 A Took out the levees.  
23 Q Okay.  
24 Well, the levee system -- was it levees or the levee  
25 system?

1 A Guess you're going to have to describe the difference between  
2 a levee and a levee system to me. Basically means the same  
3 thing.  
4 Q Isn't it true in your earlier work, sir, that you describe  
5 the levee system as including the bridges, the roads, the  
6 highways, I-5, Burlington Northern Railroad, and you  
7 described all those are the levee system?  
8 A I don't believe I did. If I did, I did it in error. It is  
9 part of Burlington Northern, a very short piece where the  
10 levee ties into it, a very short piece of the road at the  
11 very upstream end of Diking District 12 that ties into a  
12 short piece of road.  
13 Q So for your computer model do I take out the railroads and  
14 I-5 and Highway 20 or not?  
15 A Only the levees were taken out.  
16 Q Okay.  
17 Well now, of course, in this area right here, just where  
18 the dike ends, I-5 and Highway 20 have a particular elevation  
19 and that elevation acts as barrier to waters up to that  
20 elevation, does it not?  
21 A May or may not.  
22 Q Well, given a certain flood flow and flood level, the water  
23 gets -- has to get that high before it goes north into the  
24 Samish River plain, doesn't it?  
25 A A stretch of Highway 20 which runs diagonally off the top of

1 the right-hand side of the map there that has a low spot in  
2 the levee. That low spot is basically right down on the  
3 existing topography. It's not raised, in other words. It's  
4 a fairly long, low spot.  
5 Q Higher than the riverbank, isn't it?  
6 A Well, yes, it's on the floodplain.  
7 Q So it operated an impediment to the flow of water north of  
8 the Samish River basin, doesn't it?  
9 A Up to a point.  
10 Q Didn't take that out?  
11 A No.  
12 Q Didn't take out the Burlington Northern bridge?  
13 A No. Like I said, we took out all the levees.  
14 Q That operates as an impediment to the downstream flow of

15 water, does it not?  
16 A There is any obstacle in the river or in the floodplain, acts  
17 as some impediment.  
18 Q And the Burlington Northern bridge acts as a substantial  
19 impediment, but it's variable depending on the flood; isn't  
20 that correct? The Burlington Northern bridge collects  
21 debris, big logjams that operate to stop water from flowing  
22 through the channel piers in the bridge.  
23 MR. HAGENS: Objection. Without some foundation as  
24 to during what event, Your Honor, he is talking about.  
25 MR. SMART: I just said it was a variable, Your

Honor.  
THE COURT: I'll let him answer.  
A The Burlington Northern bridge collects debris. There is no  
doubt about that. I've seen picture of it and I've seen that  
it really collects debris. But you've got to understand what  
happens when it's collecting debris.  
The water is still flowing past the bridge, and the  
water accelerates as it goes past the bridge. It therefore  
undermines the bed and opens up more area to the river as the  
logjam occurs.  
This was pointed out very, very vividly in the last  
flood where they had a big logjam; the water went around  
under the trestle that was on the right-hand side of the  
bridge and scoured enough of that right-hand side of the  
bridge that it undermined the pier and the pier collapsed.  
Therefore, as the logjam builds up, the river tries to  
adjust to compensate for that blocking of the river.  
Q (By Mr. Smart) Did you ever measure the amount of scouring  
or undermining that occurred in the 1990 flood?  
MR. HAGENS: Objection to the form as to whether  
that can be measured.  
MR. SMART: Just asking him whether he measured.  
THE COURT: You may answer.  
A No.  
Q (By Mr. Smart) Did you do it for any of these other floods?

A Absolutely not.  
Q Do you know whether it existed if you didn't measure it?  
A This is a phenomenon that would happen in that type of a  
river.  
Q But you don't know what extent or to what extent then the  
Burlington Northern bridge and its logjams operated as an  
impediment for any one of these floods?  
A No. No one else does, either.  
Q You didn't seek to measure it?  
A No.  
Q But the principle is correct, is it not? Something that  
spans a stream and then you have logs or logjams that build

13 up, that the water backs up behind it. I mean, it's the  
14 principle that is known to the original hydraulic engineer,  
15 the beaver, right?  
16 A Water will back up. Backing up of the water creates a head  
17 difference, water surface distance from upstream to  
18 downstream. The bridge causes the water to accelerate under  
19 the logjam scouring the bed. The only time it wouldn't do  
20 that is if it was a concrete channel.  
21 Q And the head difference, the difference between the level  
22 upstream of the bridge and the level downstream of the bridge  
23 is roughly a measure of how much of the bridge is an  
24 impediment and how much it adds to water surface elevation on  
25 the upstream side of the bridge, correct?

1 A Some indication of that is correct. It's not a direct  
2 relationship, but it does --  
3 Q That is the general principle, correct?  
4 A Generally speaking.  
5 Q And you understand that in every major event there is a head  
6 drop that is observable by witnesses at the Burlington  
7 Northern bridge because of this logjam effect, correct?  
8 A There is an observable head drop across. A very localized  
9 head drop.  
10 Q Did you ever measure, sir, how far upstream the effect of the  
11 logjams were in terms of raising water surface elevation  
12 above the Burlington Northern bridge in the 1990 flood?  
13 A It would be very difficult to do because the logjam was in  
14 place. How would you measure it? You would have to measure  
15 it against something without the logjam in place.  
16 Q My question simply, sir, was: Did you do it?  
17 MR. HAGENS: Objection. Some foundation as to  
18 whether it could be done.  
19 MR. SMART: That is the next question.  
20 MR. HAGENS: Object for the form of the question  
21 without some foundation that it could be done.  
22 THE COURT: Sustained.  
23 Q (By Mr. Smart) I take it you couldn't do it.  
24 A It couldn't be done, no.  
25 Q And therefore, you didn't do it, right?

1 A No.  
2 Q It couldn't be done for any of these other floods, either; is  
3 that right?  
4 A Unless -- unless a person could catch it with and without the  
5 logjam. Then you can measure the effect upstream how far it  
6 extended.  
7 Q But the principle we're talking about is that the more  
8 obstruction you get, near the bigger the logjam, the more  
9 water will back up upstream, correct?  
10 A That is correct.

11 Q Okay.  
12 Beavers use that principle every day.  
13 A It's a little bit different. They dam the stream completely.  
14 Q Try to.  
15 A Try to, yes.  
16 Q But it doesn't all happen in a day, right; they got to start  
17 somewhere?  
18 A Yeah.  
19 Q Did you survey the elevation of Burlington Northern -- excuse  
20 me. Did you survey the elevation of Dike District 12's dike?  
21 A Dike District 12's elevation were surveyed for the 1979  
22 general design by the corps.  
23 Q Did you ever survey yourself, sir?  
24 A I did not survey them, no. I'm not a surveyor.  
25 Q Did anybody survey them in your work for this case?

1 A No.  
2 Q Did anybody else working with you in Northwest Hydraulics,  
3 for instance, Mr. Mutter, your partner, did he survey the  
4 elevations?  
5 A The elevation was not surveyed.  
6 Q Where do you find the elevations for the Burlington Northern  
7 dike in the general design memorandum?  
8 A Burlington Northern dike?  
9 Q I'm sorry. The Dike District 12 dike.  
10 A District 12's dikes extends upstream from Burlington  
11 Northern?  
12 Q Right.  
13 A In the general design memo. On plates in the back of the  
14 first volume.  
15 Q You have that with you here, sir?  
16 A Yes.  
17 Q You mind getting that, please?  
18 A (Witness complying.)  
19 Q Again, this was the report, sir, that you were the chief  
20 hydraulic engineer for in 1979?  
21 A That's correct.  
22 Q You didn't do the survey work yourself; you had somebody  
23 else do it?  
24 A The surveys were done by the Corps of Engineers.  
25 Q That was your employer at the time?

1 A Yes.  
2 Q You were the chief engineer, so it was done in conjunction  
3 with the project you were doing?  
4 A That's right.  
5 Q Now, learned at that time what the height of the levees were  
6 for Dike District 12, correct?  
7 A That's correct.  
8 Q And at that time, you were already familiar with the

9 principle that if you had a levee on one side of the river  
10 that the river surface would naturally -- and I think you  
11 used the term "common-sensically" yesterday -- would  
12 naturally flow to the height of that levee. And then if  
13 there wasn't a corresponding levee on the other side, would  
14 spread out across the floodplain.  
15 A The purpose of the illustration was not necessarily flow to  
16 the top of the levee, but the water that was on the right  
17 bank would be displaced into the left bank.  
18 Q Yeah. But displaced up to the height of the levee, assuming  
19 the levee didn't break.  
20 A Assuming it didn't break, yes. If the flood was big enough  
21 to do that.  
22 Q And you were familiar with that principle in 1979?  
23 A Obviously.  
24 Q And you have always been familiar with it. It's common  
25 sense, right?

1 A Obviously.  
2 Q And can you give me the plate number for the survey?  
3 A 5B.  
4 Q Thank you.  
5 Now, this survey height of the levee was done in 1979;  
6 is that correct?  
7 A No, it was done before that.  
8 Q Oh. Sometime between 1975 and 1979?  
9 A I believe you would be correct saying that.  
10 Q And you earlier stated that the assumptions that you made for  
11 your computer model took the topographic information that  
12 existed in 1975 as being the same as the topographic  
13 information that you used in 1990, correct?  
14 A Yes.  
15 Q Okay.  
16 And that would have included the same topographic  
17 information, for instance, the height of the Dike District  
18 12's levee, wouldn't it?  
19 A Right.  
20 Q So you --  
21 A One exception. The model did not really put in the height of  
22 the levee, it says a levee is there.  
23 Q Um-hum.  
24 A It didn't go on and say "elevation so-and-so" all the way up  
25 there. We were not looking at that. We were looking to

1 see -- you know, the levee didn't fail in '75. We knew it  
2 didn't fail in '90. So it was no need to put the top of the  
3 levee in. We put a levee in.

4 Q Okay.  
5 And that brings up another point.  
6 You were talking about keyways and riprap and that kind

7 of thing. Those projects, the keyways and the riprap, they  
8 don't raise the top of the levee, correct?  
9 A That's correct.  
10 Q All right.  
11 So they don't raise the height at which the water  
12 surface elevation will rise up; all they do is make sure that  
13 the dike maintains its structural integrity.  
14 A A keyway will assist in maintaining the structural integrity.  
15 Q And riprap does the same thing too, by trying to deflect the  
16 force of the flowing water.  
17 A It prevents erosion along the face. It doesn't try to  
18 deflect.  
19 Q We'll use your term. It prevents the erosion by keeping the  
20 water from eating away at the underneath of the side of the  
21 levee, correct?  
22 A But there is also another thing that can happen with riprap.  
23 You put riprap in and you restrict the channel somewhat,  
24 which in turn can result in some minor risings of the river.  
25 Q You earlier indicated that for any of the topographic changes

1 between 1975 and 1990 they were some minor -- relative to the  
2 variable of the water flow, that they, for practical  
3 purposes, made no difference.  
4 A That's correct.  
5 Q And you still agree with that?  
6 A I agree with that.  
7 Q All right.  
8 Now,, in your historical investigation into this case  
9 and in the history of the Skagit River dikes, did you make  
10 determination as to when the last raising of Dike District  
11 12's dike was? I'm talking about the increasing the height  
12 above sea level.  
13 A Which portion of Dike District 12? Dike District 12 runs for  
14 quite some distance. Are we talking upstream from the  
15 Burlington Northern?  
16 Q Let's talk about -- get that straight. I think that is a  
17 good point.  
18 You would agree, would you not, that Dike District 12 is  
19 the most significant dike we're talking about with respect to  
20 water levels in the Nookachamps?  
21 A That is the most significant, right. Dike District 17 is  
22 significant, also.  
23 Q Well, but this is the most significant dike, wouldn't you  
24 agree with that?  
25 A Of the two, yes.

1 Q If you've got a head drop between the upstream level because  
2 of the Burlington Northern bridge and down below the bridge,  
3 and if the levees aren't overtopped, it really is the  
4 limiting factor concerning how much the water surface

5 elevation will rise in any particular flood event in the  
6 Nookachamps, isn't it?  
7 A No, not necessarily. Diking District 17 does contribute.  
8 Q Well, Diking District 17 is on this side of the levee.  
9 A That's right.  
10 Q This side of the river and Dike District 12 goes around to  
11 about here?  
12 A That's correct.  
13 Q These levees were not overtopped in '75, correct?  
14 A That's correct.  
15 Q And they weren't overtopped in 1990?  
16 A That's correct.  
17 Q And in fact, if you look at the hydrographs and the rating  
18 curves for the gauge that is located at this bridge, you can  
19 tell that they passed the same amount of water for a given  
20 flow for 1975 and 1979, can't you, 1990?  
21 A Same amount of water?  
22 Q There wasn't any change in the ability of the system  
23 downstream from the Burlington Northern bridge to discharge  
24 water between 1979 and 1990, was there?  
25 A All the water went through there. Right.

1 Q For a given flow, this system passed the same amount of water  
2 through this area, did it not?  
3 A In the upstream. Then goes out the water main, correct.  
4 Q And the rating curve of the USGS gauge were the same for '75  
5 and '90, weren't they?  
6 A I didn't say that. I don't know. I can't say that.  
7 Q Is that because you didn't investigate that?  
8 A I can't say that. I don't have it in front of me. And my  
9 recollection is such that I don't recollect that to be the  
10 case.  
11 Q All right.  
12 Did you ever study the rating curve for the USGS gauge  
13 at the riverside bridge?  
14 A I've seen the rating curve. Dr. Mutter studied it in far  
15 more detail than I have.  
16 Q I take it you didn't study it.  
17 A I didn't study it in detail. No, I have seen it.  
18 Q Isn't that an important piece of information, to look at the  
19 rating curves for the only gauge that gives us water flow and  
20 water surface elevation?  
21 A Definitely, definitely.  
22 Q That is an important piece of information?  
23 A Definitely.  
24 Q Okay.  
25 Get back to this fine point and finish up before the

1 break.

2 We're agreed that this is the most significant

3           impediment -- most significant factor in determining the  
4           water surface elevation in the Nookachamps, correct?  
5    A       The levees upstream from Mount Vernon are the most  
6           significant, yes.  
7    Q       And you have known that since you first became aware of them,  
8           correct: Because it's common sense, you look at the height  
9           of the levee over here and you know that the water can't get  
10          through it unless the levee breaks. And so there is going to  
11          be a corresponding water surface elevation in times of high  
12          water across the floodplain, correct?  
13    A       That's right.  
14    Q       When did you first start with the corps?  
15    A       Say again?  
16    Q       When did you first start with the corps?  
17    A       I started in 1961.  
18    Q       Has this principle been in effect since that time?  
19    A       The principle of the hydraulics of that type of condition?  
20    Q       Yeah. The common-sense principle that the water would rise  
21          to the height of the Dike District 12's levee since you first  
22          became aware of it in 1961.  
23                 MR. HAGENS: Object to the form. That isn't what  
24          the testimony -- object to the -- lack of foundation. He  
25          didn't say they rose to the height of the levee. He talked

1           about the levee causing water -- taking water from one side  
2           and moving it to the other.  
3                 THE COURT: I don't think that is his question.  
4                 MR. SMART: That's correct.  
5                 THE COURT: He is presupposing another circumstance  
6           of the water rising to the top of the levee.  
7    Q       (By Mr. Smart) Yeah. And the testimony has just been that  
8           unless the dike breaks, it will rise to the top, correct?  
9    A       If there is enough water.  
10   Q       (By Mr. Smart) Right.  
11   A       Right.  
12   Q       And so you have known that since 1961, correct, when you  
13          first started with the corps?  
14   A       Definitely, definitely. It's just common sense.  
15   Q       All right.  
16                 And one final point.  
17                 And that is, sir, did you ever investigate as to how  
18          high the levee was in 1955, Dike District 12's levee?  
19   A       No, I never had any need.  
20   Q       That is because Mr. Hagens, again, didn't ask you to do it?  
21   A       We had no need to do it. We didn't see it necessary to do  
22          it.  
23   Q       That is because you made the assumption for your computer  
24          models that you were only going to compare a levee versus no  
25          levee situation. You weren't going to try to establish what

1 the increase in water in the Nookachamps was by any minor  
2 maintenance or minor raising between when the levees were  
3 first built in 1990?

4 A Our study was to determine how much the levees raised the  
5 water surface in the Nookachamps for the 1990 flood.

6 Q The answer to my question, sir, is what?

7 A That was the answer for the question that I got from you.

8 Q I don't think it was. I'll ask it again.

9 Isn't it true, sir, that you never tried to determine  
10 what the incremental increase was for any project that  
11 strengthened or possibly raised the levee a little bit  
12 between let's take the years 1955 to 1990?

13 A No.

14 Q You only sought to compare the existence of the levee with no  
15 levee whatsoever.

16 A That's right. With and without levee.

17 MR. SMART: Thank you.

18 THE COURT: All right.

19 With that, Ladies and Gentlemen, we'll take our noon  
20 recess. We do have a matter set for one o'clock, so we'll  
21 reconvene at 1:30. Ask the jurors to be back in the jury  
22 room at 1:25.

23 Again, with our standard admonition: Please do not  
24 discuss the case with each other, among yourselves or with  
25 anyone else. And do not remain within the hearing of anyone

1 so discussing the case.

2 And with that, we'll see you then at 1:30.

3 Thank you.

4 (The following occurred outside  
the presence of the jury.)

5 MR. REGAN: You have one juror that doesn't wear  
6 his name tag. I didn't say anything to him whatsoever. But  
7 I didn't know he was a juror. It was underneath his sweater.

8 THE COURT: Do you remember which juror.

9 MR. REGAN: It was a shorter, older man with a  
10 sweater on.

11 THE COURT: We'll make sure that Aaron reminds them  
12 to make sure they keep those tags out where we can all see  
13 them.

14 Thank you. That is very important.

15 Counsel, anything else?

16 MR. SMART: Nothing here.

17 THE COURT: All right.

18 (Noon recess was taken at 12:04  
19 p.m.)

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