2-13-1975

Record of Proceedings at the Trial

Wayne C. Lenhart
Court Reporter, Spokane, Washington

IN THE DISTRICT COURT OF THE UNITED STATES
FOR THE EASTERN DISTRICT OF WASHINGTON
NORTHERN DIVISION

THE UNITED STATES OF AMERICA,

Plaintiff,

v

BARBARA J. ANDERSON, JAMES M. ANDERSON, BOISE CASCADE CORPORATION, NAOMI COOK, RAYMOND E. COOK, DAWN MINING CORPORATION, BENEDETTO DITURI, JANICE L. DITURI, MARY DITURI, VICTOR J. DITURI, DOLORES DUDDY, PAUL F. DUDDY, FAY ECHELBARGER, M. B. ECHELBARGER, LENA E. EDWARDS, DALPH G. EDWARDS, JoANN C. FLETCHER, JOHN G. FLETCHER, SEYMOR A. FLOOD, VERA FLOOD, EDWARD A. FRANKS, IRENE FRANKS, MAUDE L. GRUPE, ELLA E. HALL, WILLIAM R. HALL, MARION L. LAMB, VERA MAE LAMB, ESTHER LUTHER, GEORGE LUTHER, JANE DOE LYONS, LEONARD E. LYONS, ARTHUR A. MILLER, RUTH J. MILLER, JANET E. NELSON, RUTH J. NELSON, JAMES R. NEWHOUSE, JANE DOE NEWHOUSE, DOROTHY F. SEAGLE, ROBERT J. SEAGLE, SECURITY INVESTMENT SERVICE, JOHN A. SMITH, MARGARET M. SMITH, A. L. SMITHPETER, FLEETA L. SMITHPETER, FRANCIS L. SMITHPETER, FRED N. STAHL, RUTH M. STAHL, ELIZABETH SWIGER, KENNETH E. SWIGER, DORTHY F. TASCHEREAU, GEORGE G. TASCHEREAU, TRANS WEST COMPANY, WASHINGTON WATER POWER COMPANY, ELLA M. WATSON, TRUE H. WATSON, CAROL WELK, PETER M. WELK, CLARA WILLGING, GUST WILLGING, and the STATE OF WASHINGTON, LLOYD FLOOD and ALICE FLOOD,

Defendants.

Civil No. 3643

RECORD OF PROCEEDINGS AT THE TRIAL

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Marlan D. Harvey	544	564	580	584		
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Alex Sherwood	652	680	713			
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IN THE DISTRICT COURT OF THE UNITED STATES
FOR THE EASTERN DISTRICT OF WASHINGTON
NORTHERN DIVISION

THE UNITED STATES OF AMERICA,
Plaintiff,
v
BARBARA J. ANDERSON, et. al.,
Defendants.
Civil No. 3643

BEFORE:

The Honorable Marshall A. Neill, Judge.

DATE:

Monday, March 11, 1974.

APPEARANCES:

For the Plaintiff United States of America:

Mr. James B. Crum
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Olympia, Washington, 98504

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For the Defendant Peter M. Welk:

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IN THE DISTRICT COURT OF THE UNITED STATES
FOR THE EASTERN DISTRICT OF WASHINGTON
NORTHERN DIVISION

THE UNITED STATES OF AMERICA, Plaintiff, v BARBARA J. ANDERSON, et. al., Defendants.	Civil No. 3643

RECORD OF PROCEEDINGS AT THE TRIAL

BE IT REMEMBERED:

THAT the above-entitled action came regularly on for trial and determination on March 11, 1974, before the Honorable Marshall A. Neill, Judge, in the District Court of the United States, for the Eastern District of Washington, Northern Division, Spokane, Washington, the plaintiffs appearing by attorneys as shown on page 6(a) and 6(b); the defendants appearing by attorneys as shown on page 6(b) and 6(c);

WHEREUPON, the following proceedings were had and testimony taken, to wit:

THE COURT: Good morning.

THE CLERK OF THE COURT: Civil 3643, The United States of America and Spokane Tribe of Indians versus Barbara J. Anderson, et. al.

MR. CRUM: The Government is ready, your Honor.

MR. DELLWO: The Tribe is ready, your Honor.

THE COURT: It's going to be a little difficult to ask if the defendants are ready, I guess.

I think for the record we'd better identify which counsel is representing which parties so later on we don't have confusion over that. Now, I'll ask the Reporter to get those names so that later we will know where we are.

Starting with the Government, would you identify counsel, and as you go around, identify which defendants you represent?

MR. CRUM: James Crum, United States.

MR. GERMERAAD: John Germeraad, United States Government.

MR. RUDOLPH: Kermit Rudolph, Spokane Tribe.

MR. DELLWO: Robert Dellwo, Spokane Tribe.

MR. CAMPBELL: John Campbell, A. L. Smithpeter.

MR. TRACY: Larry Tracy, Jim Newhouse.

MR. REKOFKE: Joe Rekofke, Boise Cascade.

MR. ZELLMER: Willard Zellmer, Robert Seagle.

MR. CERUTTI: Patrick Cerutti, Robert Seagle.

MR. TORVE: Theodore O. Torve, Department of Natural Resources, State of Washington.

MR. DUFFORD: Wick Dufford, Department of Ecology, State of Washington.

MR. ROE: Charles Roe, Department of Ecology, State of Washington.

MR. McNICHOLS: Robert McNichols, Dawn Mining Company. I might say, your Honor, it's probable that I might not be participating. Counsel for plaintiff and Dawn have personally worked out a stipulation that is satisfactory.

THE COURT: Fine.

MR. McRAE: John McRae, Peter Welk.

THE COURT: Any others? All right, plaintiffs, call your first witness.

MR. GERMERAAD: The plaintiff would call their first witness, Mr. Walter L. Woodward.

PLAINTIFF'S CASE-IN-CHIEF

WALTER L. WOODWARD,

being first duly sworn, testified on behalf of the plaintiff as follows:

THE CLERK OF THE COURT: Will you please state your full name to the Court, and spell your last name?

A My name is Walter L. Woodward, W-o-o-d-w-a-r-d.

THE CLERK OF THE COURT: Thank you.

MR. GERMERAAD: Your Honor, there is one thing I'd like to inform the Court about, and that is that last Friday evening Mr. Woodward suffered a slight heart attack, so the doctor has told him he can proceed, but we'd like to ask everybody's indulgence, and we may take frequent breaks for Mr. Woodward.

THE COURT: That is satisfactory.

MR. GERMERAAD: Perhaps, to save some time and since all the exhibits that will be coming in through Mr. Woodward's testimony have been on file for some period of time, and everybody has had an opportunity to look at them, because, as far as I know, no objections have been lodged, I'm wondering if we could have all the exhibits, which I think are pertinent and relevant, it's obvious, just introduced all at one time, to save time, rather than doing it piecemeal through Mr. Woodward's testimony.

THE COURT: For the record, you'd better identify those.

MR. GERMERAAD: Okay, your Honor.

THE COURT: They're in consecutive numbers, I presume?

(Lengthy pause.)

MR. GERMERAAD: Your Honor, do you want me to identify them one at a time?

THE COURT: Oh, no. No, but somewhere in the record we're going to have to know which exhibits have been admitted.

Now, it might be easier, and I might advise counsel at this time, I do have a short criminal calendar that takes up at 1:30, so we will recess this case at noon, until 2:30. Now, maybe it will be easier, during that long break, if you can get -- All I want to make sure of is that the record is clear, which exhibits have been admitted. Now, you can proceed this morning, subject to the admission of those exhibits, when you get your lists prepared, that would be satisfactory to the Court.

MR. RUDOLPH: A lot of these were tentatively marked for identification when they were filed, we could use the same numbers, and possibly get them marked during the period you were talking about.

MR. GERMERAAD: They are marked Number 1 through 30, and then Exhibit 3-1-74-4, and 3-6-74-29.

MR. RUDOLPH: Those are the ones to Mr. Woodward.

THE COURT: So Plaintiff's 1 through 30 were previously marked?

MR. GERMERAAD: Right, your Honor.

THE COURT: Plus the last two you identified?

MR. GERMERAAD: That's correct.

THE COURT: Now, are there any defense counsel that have not examined any of the exhibits, or who wish to register an objection to their introduction?

(No response.)

THE COURT: Exhibits 1 through 30, and the exhibits marked 3-1-74-4, and 3-6-74-29, are each admitted.

MR. GERMERAAD: Thank you, your Honor.

DIRECT EXAMINATION

BY MR. GERMERAAD:

Q Mr. Woodward, would you give us your business address, please?

A My business address is West 905 Riverside, Spokane.

Q Tell us what your profession is, please?

A Consulting Civil Engineer.

Q Would you please tell the Court where you received your professional training?

A My college training was in the University of Wyoming, where I received a Bachelor of Science in Civil Engineering.

Q Was there any particular emphasis in the Civil Engineering

course at Wyoming?

A Where I had a choice of subjects, I chose the water-related subjects, and Wyoming being a dry state, there was a little emphasis on water.

Q There was little emphasis?

A There was a little emphasis on water.

Q Thank you. Are you a member of any honorary or professional organizations?

A Not honorary, but professional, yes. American Society of Civil Engineers, the Washington Society of Professional Engineers, American Water Works Association, Water Polution Control Federation.

Q Have you held any posts or offices in some of these organizations?

A At one time when we -- Probably 20 years ago, I was president of the Spokane Chapter of the Washington Society of Professional Engineers, and I was a director in the State Society.

Q Are you a registered professional engineer in any state?

A I'm registered in Washington State, by examination. I'm registered in Idaho, Montana, Oregon, Wyoming.

Q Could you please give the Court a short synopsis of your experience in the field of engineering, and particularly that having to do with water?

A I was born and raised on an irrigated farm, and that made me appreciative of the water means, and I have, -- My father was a consulting engineer, predominantly in the water works field, and all of my education I have channeled in that regard.

Q Did you work at any time while you were going to school, in this field?

A Between my junior and senior years, I was with the Bureau of Reclamation for two years in the same field.

Q After you graduated, what work experience did you have?

A I had a short period with the Bridge Design Office, State of Wyoming, two years, I believe, and then I transferred to the Soil Conservation Service, directly related with the water works, water yield, and working with soil scientists.

Q During this period, you mentioned water works, did you deal with irrigation problems, and specific --

A Irrigation water stock ponds, everything related to water.

Q Was there a time that you moved from the Soil Conservation Service to a different agency?

A When I was with the Soil Conservation Service, there was established a department within the Department of Interior, the Soil and Moisture Conservation Operations. My immediate superior transferred to it, and, too, some

of his key personnel, and I was one that was taken, too, at that time, to go down into Wyoming, and by mistake I was sent out here to the Great Northwest, and I had the job of the Regional Engineer for the soil conservation operations of the Interior Department and assigned to the indian reservations of the Northwest.

Q What year was this?

A I reported for duty on December 7, 1941.

Q Could you tell us a little bit about the type of work that you did on the different indian reservations here in the Northwest?

A Very closely parallel to the work I am presently involved in here; water supply, its utilization, and its best use on indian lands.

Q What was your next job, after being with the Soil and Moisture Conservation Service?

A I was with the S.M.C.O., as it was called, for five years, and at that time, the regional office was moved to Portland, central office, and, it took on another state or two. At that time, I left the indian service, or the Interior Department, and hung out my shingle as a private consulting engineer. At that time I was going into irrigation, specializing in irrigation, and after a few years of that, I, being in competition with the government, doing the same job cheaper, I ended up

by being more in domestic water supplies, water works for cities, districts, and then, following that, in the sewage treatment works.

Q Is there something about the Colville Reservation about, which I think you might reasonably be proud, that you'd like to tell us about?

A When I first started out, we did establish an earlier built Monse project down at the mouth of the Okanogan, and where it runs into the Columbia, and we did fill, or put together, an irrigation project, I believe it was 800 acres in one piece, which at that time was supposed to have been the biggest single irrigation under one unit.

Q Since 1946 when you first entered private practice, have you been in the private practice continuously since that time?

A Continuously, yes.

Q Has your practice been confined simply to the Spokane area, or is there a wider geographical area that you cover?

A We have covered five states, and, and we have concentrated more closely to home, but we have done work in Wyoming, Oregon, Idaho, Montana and Washington.

Q During your practice have you employed other people?

A In various amounts, yes. We are not a large outfit.

We usually have three or four employees. We have had as many as 14 or 15.

Q Do you have a very close relative that works with you?

A I have had my brother, Ira, he is five years younger, and he followed the same path as I did.

Q When were you first approached by the Spokane Tribe to study their reservation area?

A I had known the tribal attorney for many years, and he was acquainted with our work, and I will have to refresh the exact dates here. I believe it was in about August that I was approached, August of '70, that I was approached by Robert Dellwo, the tribal attorney, and in regard to preparing and, in general, an overall water resources plan for the Spokane Tribe, and specifically a more detailed review of this Chamokane Creek basin, in anticipation of administering and protecting their resources.

Q Was there a formal tribal resolution that confirmed your employment, then, with the tribe?

A In my discussions with Mr. Dellwo, we'd gone over several of the main points, and which he worded into a, helped me word into a proposal to the Spokane Tribe, which was adopted, and again, I'd have to look again to the dates.

Q Would that perhaps have been September 3, 1970?

A September 1st, 1971.
Q Are you sure it was '71, or '70?
A I'd back up, oh, no, my study started in September of 1970.
Q Okay, thank you.
A In anticipation of this, let me insert that I had taken, on my own, several makings which I anticipated would be needed during the irrigation season, just to have them on hand.
Q You have told us a little bit about the overall purpose of your study; could you tell us about, perhaps, what percentage of time you have spent on this project since late summer of 1970?
A I would say that approximately one-third of my time was connected with this project, and that would be divided in the, somewhat in the overall overview of the whole reservation, and connected directly with the Chamokane Creek.
Q What kinds of studies and activities did you undertake for the Tribe in doing your study?
A Well, our first approach, of course, would be the topography of the area in reference. This we depended on the geological survey quadrangle sheets.
Q You're referring to the United States Geological Survey Sheets?

A United States Geological Survey Sheets. We studied the geological structure of the area, in reference, and any literature we could dig up or review. We made our own field investigations, and when we felt they were, where the material was a little deficient, we'd have wells drilled to determine water depths in the Walker's Prairie, which we may call the Chamokane Valley, or the water which will be used interchangeably.

Q Did you also --

A We had --

Q Go ahead.

A We then had, if I may back up a little, just a little. Our first approach to this study was that we felt it could be correlated, perhaps, to a miniature Spokane Valley. In the Spokane Valley, why, we would find a gradient of possibly five foot to the mile in slope of our water surfaces. Like, out north we'd find it maybe eight foot to the mile. We go to the Chamokane Basin, and we find that our gradient on the well would be up to 14 or 15 foot to the mile, indicating a much tighter under layer.

Q Could you describe, or define to the Court, and everyone here, what you mean by gradients?

A Anytime water moves in soil it has to have some kind of gradient to force it along. The tighter the material,

the steeper the gradient.

Q In your investigation, did you use any devices to measure any water flow of any type?

A We, at this point, to verify our thinking on the permeability, transmissibility of the soils of which we're talking, we did have a seismic profile run transverse across the valley in three separate points, and these did verify and help give credence to our previously-assumed ideas on these materials in the basin.

Q Is there a U.S.G.S. gaging station out on Chamokane Creek?

A Before, I believe, actually, we -- or had established this gaging station, we wanted to be sure in our own minds that we were establishing this station at a point where it would, in our opinion, be representative of the total amount of the water that did come down through that basin, and several spotchecks we did go through and had established in cooperation with the United States Geological Services, an official gaging station just below the Chamokane Falls. We found less water below it, we had found less water above it, due to its spreading out in the valley itself.

Q When, in time, was this gaging station set up?

A The gaging station was finally established, I believe, in February of '71.

Q Since you first began your work in late 1970, how often have you visited Chamokane Creek Drainage Basin?

A With very few exceptions, I have been there every week going on four years.

Q Is precipitation important in your study of the Chamokane Creek Basin?

A It's the supply where all the water does come, so it's of main importance.

Q Okay. I'm going to put up on the board what we've been --

THE COURT: Counsel, before you proceed with that, I know it's a little difficult for this many defendant counsel, maybe defendant counsel wishes to Voir Dire the witness on his qualifications as an expert?

(No response.)

THE COURT: In this same connection, although I asked for identification of counsel, I think this counsel came in after we identified counsel. Let me recognize him.

MR. McGREGOR: T. S. McGregor, representing Paul E. Schaffner, Urban Charles Schaffner and Norma F. Schaffner, husband and wife, and Urban S. Schaffner and Cora Schaffner, husband and wife, and the Fletchers.

THE COURT: Also there may be defendants here who are pro seing, that is, do not have counsel, but who are

here in their own behalf. If we have such defendants, I think they should be identified, for the record.

MR. STAHL: Yes, your Honor, we are Fred and Ruth Stahl.

THE COURT: Would you spell that last name, please?

MR. STAHL: S-t-a-h-l.

THE COURT: Are there others?

MR. SWIGER: Kenneth and Elizabeth Swiger.

THE COURT: Any others?

MR. LYONS: I'm Leonard Lyons, from out at Ford.

THE COURT: You may proceed.

MR. GERMERAAD: Thank you, your Honor.

Q (By Mr. Germeraad) Mr. Woodward, I have put Plaintiff's Exhibit 1 up on the board, and you can leave your seat, and could you go over to the exhibit, and I'll ask you some questions about it?

A (Does so.)

Q Could you first tell us what Plaintiff's Exhibit 1 is, please?

A It's the Geological Survey map of the State of Washington.

Q And could you please orient us to the location of the Spokane Indian Reservation versus where we are here in court today?

A Here's Spokane.

Q And you place an "X" with a red felt pen at Spokane?
A Yes. If we go to the -- We'll start at the mouth of the Spokane and the Columbia, I'll outline the area about which we're talking. Following, it does go through Boundary Butte, along the 48th Parallel, where it intersects the Chamokane Creek, according to this, reading down, to its intersection with the Spokane, following the south side of the Spokane to the Columbia. (Marks with hash marks.) That's the Spokane Indian Reservation.
Q Then you've outlined in red felt pen at the upper right-hand corner of the State of Washington this area of the Spokane Reservation?
A Yes.
Q Just stay there at the board.

We have now placed up on the board Plaintiff's Exhibit 2. Would you please describe what Plaintiff's Exhibit 2 is, for the Court, please?

A This represents the drainage basin on the entire Spokane Indian Reservation and those basins that contribute water --

(Interruption by Court Reporter asking for repeat.)

A -- where water is contributed to water to the Spokane Indian Reservation.
Q Is there some wording in the lower right-hand corner

of that exhibit which will help us additionally identify that as Plaintiff's Exhibit 2?

A Uh, it's, Exhibit 2, we have it as Plate Number One, which it was referred to in the book we've prepared for the Tribe. This has been revised to 2-15-73, according to the Court's order, and it does represent the drainage basin.

Q Where does this map come from, how does it relate to the previous map, or where does the information come from to construct this map?

A Here again, we have referred to the United States Geological Survey in which we have faded off portions which we didn't feel relevant to it; we have emphasized the parts we felt did, like the creeks, we brought those out, and we have divided into the various basins that do contribute.

Q Could you please identify what the various drainage basins on the Spokane Indian Reservation are?

A Starting here, clear from the west, we identified these as the southwest slopes going directly by short streams into the Columbia, or the Spokane arm. We have the Enterprise Valley area leaving the reservation. We have the McCoy Basin, which is a contained basin.

Q That is the same thing as a closed basin?

A It is a closed basin. Orazada form the Ferguson and

Orazada Creek. The Sand Creek Basin, this takes, for the most part, its supply from the reservation, but does extend off the reservation, running out to Sand Creek.

Q Does the Orazada and Sand Creek, what do those creeks drain into?

A Into the Spokane River.

Q Thank you.

A Then we come to the Blue Creek drainage. Let's see, I believe it discharges all into the Spokane River. The southern slopes are hard to identify. There is a number of different drainages, all going into the Spokane arm. Then we come to a much larger basin, the Little Chamokane Creek Basin, which borders here, and just barely leaves the reservation. For the most part, it's on the reservation. Its drainage goes close to a point where the Big Chamokane drainage goes into the Spokane. Then we come into the major basin, which contributes approximately half of the water of the total reservation, and this portion of it, the water is on the reservation, and this portion of water is adjacent to the reservation, that we have coming down through the reservation.

Q Okay. There is marked on the right side of this exhibit in red felt pen, what does that red felt outline indicate?

A That would represent, to the best of our knowledge, the boundaries of water contributing to this basin.

Q And then I notice that you have in blue and dashed brown lines within that red outline; what is that?

A We have the blue as a continuous creek. That line goes, we have a brown line which we have indicated dotted as an intermittent stream. And that, by the way, may be where Chamokane got its name. Chamokane means over-and-under. That is the way it got its name. You notice also that we find streams coming in from the edges, and there is quite a few of these creeks that go into the main channel of the creek.

Q In this creek, you're also talking about the Chamokane Creek?

A I'm also talking about the surface, visible surface parts of the Chamokane, yes. Brio Canyon does run most of the year, not necessarily during the irrigation season, but in most parts they do come out into the edge of the basin and stop.

Q There are small hash marks along a straight line and along the creek. Could you tell us what this represents?

A These identify the boundaries, the northern boundary of the Spokane Reservation, and here are the easterly and southeasterly mountains. The Spokane River we didn't do.

Q I believe it would be better to stay at the board.

I'm now going to hand you United States Reports, Volume 246, at page 286, which is the case of Northern Pacific Railway versus Wismer, and on page 286 there is a description there of the reservation treaty which was written at the time of the agreement of the Indians and Colonel Watkins and Captain Wilkinson for the United States. And could you read that for us, please?

A I'll read it:

> "Beginning at the source of the Chimokan Creek in Washington Territory, thence down said creek to the Spokane River, thence down said river to the Columbia River, thence up the Columbia River to the mouth of Nimchin Creek, thence easterly to the place of beginning."

Q Could you outline that for us, that description, on Plate Number One, Plaintiff's Exhibit 2, please? Just outline it with the pointer?

A I'm going to have to do it in general, because it was written in general, I'm quite sure. The nearest we can identify Nimchin Creek is a notch which means knife, and directly east to the Chamokane, following the Chamokane Creek down to the Spokane River, following the Spokane River to the Columbia, and back.

Q Stay right there (at the board), and I'm going to hand you an additional exhibit, which is listed as Plaintiff's Exhibit 3-1-74-17, and this is a copy of the Executive

Order of R. B. Hayes, President, January 18, 1881, and is there also a description there which you would read, please?

A "It is hereby ordered that the following tract of land, situated in Washington Territory, be, and the same is hereby, set aside and reserved for the use and occupancy of the Spokane Indians, namely: Commencing at a point where Chemakane Creek crosses the forty-eighth parallel of latitude; thence down the east bank of said creek to where it enters the Spokane River; thence across said Spokane River westwardly along the southern bank thereof to a point where it enters the Columbia River; thence across the Columbia River northwardly along its western bank to a point where said river crosses the said forty-eighth parallel of latitude; thence east along said parallel to the place of beginning. R. B. Hayes."

Q The banks of these three bodies of water shows Chamokane Creek, Spokane River, and the Columbia River. Where does the reservation's boundary -- Where is the reservation boundary, between these three bodies of water?

A According to the U. S. Reports, it would be these far banks.

Q I see. Thank you.

MR. GERMERAAD: Your Honor, I would now move that Exhibit 3-1-74-17 --

THE COURT: Counsel, is that something different

than an exhibit numbered just 17?

MR. GERMERAAD: Yes, it is, your Honor.

THE COURT: Thank you.

MR. RUDOLPH: That's going to have to have a different number.

THE COURT: Any objection to the admission of Plaintiff's Exhibit 3-1-74-17?

(Exhibit passed around counsel.)

MR. DUFFORD: Your Honor, may I ask a question of the witness on Voir Dire on this exhibit that was offered?

THE COURT: All right, go ahead. Please identify yourself for the Court Reporter.

MR. DUFFORD: Yes, I'm sorry. I'm Wick Dufford, Assistant Attorney General, for the Department of Ecology.

VOIR DIRE EXAMINATION

BY MR. DUFFORD:

Q Is the description contained in the exhibit identified as 3-1-74-17 the same as that which you earlier traced on the map before you were to the 1877 agreement?

A It's really an awfully ambiguous directive that was given, personally. For instance, if you say the beginning of that creek, it might run clear up north.

Since he then identified it down to this other stream, we probably would have to assume that it is. I have the, if the defense would like to bring it in, we have a book of assignments for the defense.

Q Now, do you recall the 48th Parallel to have been the north boundary in both agreements?

A I think that was the intent, whether it's that, or not, beyond.

MR. DUFFORD: We have no objection to the admission of that exhibit.

THE COURT: It's admitted.

(Thereupon, Plaintiff's Exhibit 3-1-74-17, being a copy of the Executive Order of R. B. Hayes, President, January 18, 1881, was received in evidence.)

(Direct Examination continuing)

Q (By Mr. Germeraad) I have now placed up on the board Plaintiff's Exhibit 3. Could you please identify that for us; is there some legend in the lower right-hand corner that will additionally help us identify this exhibit?

THE COURT: The Clerk can put her exhibit label on.

A Exhibit No. 3 is our Plate Number Two, which was elevations and expected rainfall and runoff in the watersheds, Spokane Indian Reservation.

Q (By Mr. Germeraad) Could you please use Plaintiff's Exhibit 3 and tell us about the topography of the entire reservation and perhaps it would be good, well, pick any place you want to start, but just identify it as you talk about the topography of the reservation.

A I'm wondering if I should follow through on the format -- just -- The generally flat areas are in, the flat, lower areas are in the Walker's Prairie, which are prime areas. Going up in, as we follow up each of these slopes here, for instance the lower slopes are less than a 13. The parallel in the Columbia to the Spokane, the elevations are 13 to 1500. Then we get into the area which is the Walker's Prairie, starting here at Springdale, and lying just above the bench, the Lower Columbia bench.

Q What elevation is that?

A Those are a 1500 to 2000.

Q Is that a white or blank area?

A Those are indicated here in the white, or lighter area, yes, sir. Then coming up, we have a crosshatch, which would be located in the 2000 to 2500, which does take in, oh, the Chamokane bench, and the range of this Little Chamokane Creek in here, if we can find it on the southwest slopes, and the next step would be the vertical pattern, 2500 to 3000. From there on up to

where we get clear to the 30 to 3500 feet, and we have a few points at 4000 elevation. We have also made this comparison and related it to places of like areas to the expected rainfall that we receive at those various elevations. There is a direct correlation. We have further broken this down to runoff which we might anticipate from those rainfalls, and related it to the slopes, and so on. These are the expected rainfalls we anticipated.

Q You said there was a direct correlation between elevation and precipitation. What type of correlation is there?

A The higher the elevation, the more water, the more precipitation. This had to have been done, if we'd had a whole series of rainfall gauges scattered all over the place, so the closest we can do is to relate it to, relate it to areas of similar conditions.

Q Next, I'd like to put up Plaintiff's Exhibit No. 10.

We have now placed up on the board Plaintiff's Exhibit 10. Would you please describe that more thoroughly, for the record?

A I think Plaintiff's Exhibit 10 is going to have to be an index sheet, because as we go along, we'll be referring to it as we go along, and talk about each individual item.

Q First, could you tell us the outline in red, what is that in red?

A The outline in red is our boundaries that we have accepted as the boundaries of the waters contributing to the Chamokane Basin.

Q And now, inside this area, you have designated there, "Chamokane Creek drainage". Now, is there some parts that are identified which have little flags pointing to different spots? Maybe you could tell us what those are, or perhaps you can start at the top and describe the drainage, not in too much detail, but overall, what drainage is, and what the different spots are on Plaintiff's Exhibit 10?

A The major portion of our water comes from the higher reaches, from the Chamokane at Camas Valley, and the Huckleberrys, the highest mountain regions. The Chamokane Creek goes down through the Camas Valley, which, by the way, we have marked out in a lighter green for us, and it's flatter valley area. From there we head easterly until we get near Springdale.

Q Is Springdale also denoted on the map?

A Springdale is just off the reservation, just off the drainage, north of our assumed drainage area. Comes southeasterly till we get to the point very close to the reservation line, it abruptly changes westerly and

southwesterly into a series of what we feel is intermittent flow, following the stream down to the Columbia, or the Spokane.

Now, points have come up, so we keep in mind, as we orient this thing, we'll be talking about the south gaging station, that is south, the gaging station is just south of the Chamokane Falls.

Q Is that the gaging station you said earlier was established by the United States in early '71?

A Yes. Chamokane Falls -- It lies probably six or 700 feet below Chamokane Falls. Then we have probably a mile or less above that, is the Smithpeters' diversion. We'll be talking a lot of the Massive Springs area, which we have named, into quite an area here, where the stream makes an abrupt flow to the west.

Q Is there a town next to that area which will help us?

A Oh, yes, Ford. We have two major springs, Hatchery Springs and Galbraith Spring, will be noted.

Q Is that the major portion of the Massive Springs area?

A They are the major portion of the Massive Springs area. Then we'll go into the wells. The north Seagle well, which we have records for quite some period; the Newhouse well; and on the other side, for no particular reason except we had access on the Indian side, we have established moderate wells which I'll either designate

by name or number, this being south of an abrupt hill in the northwest.

Q Okay, the southwest, that is identified by a number?

A That south well is 2840 18Q. That's using the State's identification on it.

Q What is this well here, near the north Seagle well?

A The one directly across from the north Seagle well was put in to represent a comparable condition to the north Seagle well. That is 2840 17K.

Q The next well above that is what?

A The next well above that would be 2840 8H.

Q Is that also --

A We also call that the Hill well (112) as designated by the D.R.A.

Q That's directly across, about a quarter of a mile or so, from the Newhouse well?

A We then put in a well on the north end to get a little more representative sample, 2940 33C. We did have a, we then later established another, or had established a United States Geological Survey gaging station at our north line.

Q Northern line of the reservation?

A Near the northern line, about a half a mile south of it. We had been taking little, periodic weeping flows from that.

THE COURT: Can you identify on that map the northernmost point that we viewed? I recognize the southern.

A All right.

THE COURT: How far, where, on the map, did we go, to the north?

A Across the bridge, in a ways, that's all washed out now, you couldn't get a mile, half mile. We stopped at the Smithpeter diversion, and we went through the Massive Springs area, and we went back over and across up, oh, I believe we went up the west side a ways. We did not, I don't, I don't know whether we went across to the north Seagle well or not.

THE COURT: But it would be here, and then come back down this way?

Q (By Mr. Germeraad) Now, using that exhibit, No. 10, which you have essentially described, could you tell us about the flow or the characteristic of Chamokane Creek from its source to its mouth; just one section at a time, please?

A I think we have to divide the Lower Chamokane Creek into probably four major stream areas. We have the collection area in the Upper Chamokane, and the Camas Valley, and to the north block.

Q Could we mark additionally on Plaintiff's Exhibit 10,

we have Camas Valley mentioned, but could we designate in the red felt pen this is also called the Upper Chamokane?

Do you think you can just write up here, "Upper Chamokane"?

Do you want to make a breaking point between that and the other section?

A They blend into each other, but generally speaking, it's where we feel that where it broke through the lateral moraines, which is caused by additional Colville-Chamokane , and that other moraines could be from

and it would be in a pretty straight line near the town of Springdale.

Q You have now laid a straight red line near the town of Springdale, cutting across here. Do these lines to the north represent --

A That way and from here on, we become more or less the Little Chamokane.

Q So to the left of that straight line is the Upper Chamokane?

A We'll call that the Upper Chamokane and Camas Valley.

Q Could you write on the left side of that red line, "Upper Chamokane"?

A (Does so.)
Q What type of flow in the creek, or how would you characterize the Upper Chamokane; what is the stream like?
A It's pretty much of a continuous stream; it's a typical flood-flow stream in which it comes from, the side washes out, the mountain, comes down off the mountain. I've seen it many times when it flooded all over the whole thing, and it has every appearance of an old lake bed which has finally cut through at this point, it's lateral moraines, into the other channel.
Q Why don't you then go on to the next section of the Chamokane that you're going to talk about?
A Even during the summer months, due to contributions of Swamp, Creek and several of the other, smaller creeks, we always find some water flowing in over our others at the north line of the Chamokane, at the reservation. We always find some.
Q Is that your north gaging station?
A Yes, we consider that a --
Q Is that your north gaging station?
A Yes. We consider that a continuous stream at that point, as shown on all our maps, as a continuous stream. We then go into periods of where we have a disappearance of this water from a mile to a mile and a-half below,

during the summer months, of the stream flowing down, going subsurface, and that indicates this line here was as indicated by the brown line, that emerges during our irrigation periods during the summer months, that emerges about Ford, just about Ford, a little above Ford, probably a few hundred feet above the Ford crossing. Then, on the Massive Springs area, we have an accumulation of water, and we call that the Massive Springs area. Then slightly below that we have accumulated almost all of the water that then flows continuous on down through the Lower Chamokane Basin into the Spokane.

Q Where the stream first becomes intermittent, is there a name for that area, that is commonly accepted?

A Walker's Prairie.

Q Is Walker's Prairie written on the map already?

A It's written right across it.

Q Is that in green?

A It's round and identified in green, yes.

Q And Walker's Prairie, did you talk of that as the mid-Chamokane?

A I'd call it the mid-Chamokane, yes.

Q Would you, maybe with the, just the initial "M.C.", would you put an "M.C." in red pen next to Walker's Prairie, so we'll know that that is the area called

the mid-Chamokane?

A (Does so.)

Q That was the second area. Now, the third area, is that the map of the spring area?

A The third area would be the map of the, I believe, the spring area, yes.

Q And below that spring area, you called it what?

A Lower Chamokane.

MR. GERMERAAD: Your Honor, as we have probably been going a little over an hour, I'd like to give Mr. Woodward a rest. Perhaps we could take a short recess?

THE COURT: We will take a 10-minute recess at this time.

(A 10-minute recess was taken at this time.)

(Direct Examination continuing)

Q (By Mr. Germeraad) Mr. Woodward, earlier you described the stages or areas at Chamokane Creek, you told us about the intermittent parts of the Chamokane Creek; how would you define Chamokane Creek, would you tell us about the width of it?

A In the intermittent area, in my opinion, the creek is not just a 20-foot stream that we can pretty well jump over and in the summer walk over, it's where we find the water lying in the basin which at that point, other than

that area, is up to two miles wide.

Q It's ground water, just ground water flow, then?

A That ground water is moving.

Q At one point early this morning, you were talking about the different studies that you made of the area, and you mentioned that in determining the hydrologic nature of Chamokane Creek and its flow, you studied the geology, or geological structure of the area. Could you please go into that and tell us a little bit more, and I believe there are probably some exhibits that you might use? First, I'll identify for the Court, we'll set out all the exhibits, and then let all the attorneys and any interested parties look at the next set of exhibits that we will be talking about.

First I believe is the picture album book which you mentioned, and are there some pictures in there that you'll use to describe this geological history of the Chamokane Creek area?

A (Witness hesitates.)

Q Just tell us what these pictures --

A These pictures, I was over in the Cheney-Cowles Museum and I seen on the wall a pair of the pictures which indicated to me two periods of the ice flow, the glacial flow during periods which were particularly pertinent and relevant to this case. It shows first,

its farthest extent down, this would be of the Colville lobe, of which we would be particularly interested in from the Columbia standpoint on the Little Chamokane, and all those.

Q These lobes are tongues of the glacier?

A They are the tongues of the glacier as it goes down in the lower areas. The farthest one we find is the Colville lobe. The farthest it went down would be probably halfway between what is now the Spokane River and Reardan. Reardan is right up over the top of the Columbia Basaltic Flow, and then the next picture then shows it where it had retreated to a point which is now the topographic design, the present topographic design just south of Springdale. At that point the Colville lobe apparently took its shorter path and broke over and joined the Columbia lobe. During that period, it formed Lake Chewelah and I understand that it also did come down through and in part come down through the Loon Lake area and through the Little Spokane area.

Q Did you take pictures of those exhibits over in the library?

A Yes, I took pictures of those. I have no idea where they're from, but they do paint it as near in a picture as I could think it myself.

Q Perhaps we could take, how many are there, there are

seven pictures in there?

A Some of them are double pictures, and some single.

Q Perhaps we could put markers, rather than marking the entire picture book, since these pictures are pertinent at this time. The picture book, I think, overall, is identified as Exhibit No. --

A There are slides covering the same thing.

MR. RUDOLPH: Twenty-seven, I think.

MR. GERMERAAD: Thank you.

Q (By Mr. Germeraad) Overall, this picture book is Exhibit 27, and perhaps we could just take these out and mark on the back 27-1, 2, 3, 4, 5, 6 and 7, which relates to the particular pictures, your Honor. This might be helpful, rather than trying to go through and file each of the pictures, your Honor.

THE COURT: Just mark the book No. 27.

A For the record, I would say these could be gotten over, I'm sure, from the Cheney-Cowles Museum, if they are not able to recognize it from this, for its immediate use.

Q (By Mr. Germeraad) I have also put up on the board Plaintiff's Exhibits 6 and 7, and I'm handing to Mr. Woodward Plaintiff's Exhibit 4, 4-A, and 5.

(Exhibits being marked at the witness' chair.)

Q (By Mr. Germeraad) That's 4-A, this is 4, and this is

5. Could you tell us, and identify what 4, 4-A, 5, 6 and 7, in turn, are?

A First start with No. 4. Exhibit No. 4 was a Preliminary Geological Map by Charles Weaver, Stevens County, map of Stevens County, and I don't have the date, it doesn't quite show on there, but it goes quite a ways back. Strictly reconnaissance. It didn't identify the earlier and later glacial periods. This glacial period may have lasted a million years. It's a later glacial period which more directly affects the water in the Chamokane Basin. Now, we then have used the later Grigg's Report -- Shall I keep on?

Q Before you go on to that, could you tell us what 5 is, then?

A Five is his referral to the Colville-Chamokane Trench, as he identified it.

THE COURT: Who?

A Weaver. And this was to indicate that the glacial, as the glacier came down from the north, it would have to be several thousand feet thick at the Canadian border, and did come out into lobes and continued down, probably to the 47th Parallel.

Q Now, is 5 Weaver's Report that accompanies 4, which is Weaver's map?

A It is, and it's inserted mainly to show that he

recognizes the Colville-Chamokane Trench as a continuous glacial flow.

Q What is 4-A, now?

A Four-A, we have taken it from the Weaver Report, and put down the relative areas of glacial influence on one map, covering Stevens County, and how it brings it down to where it goes by the Spokane Reservation.

Q Could you get up and go to the board and describe Exhibits 6 and 7?

A (Goes to the board.) First, in 6, in the Weaver Report, he is taking all his glacial periods and lobbed them together, and on this we have superimposed, by the way, our wells in this map here.

Q Now, on 6, excuse me, before we go on, 6 is also identified as Plate Number Three, General Geology and Well Locations?

A Yes.

Q Is this a legend in the lower left-hand corner to identify types of rock that is mapped?

A We have Glacial Drift, Camas Basalt, Gerome Andesite, Undifferentiated Argillite, Undifferentiated Limestone, Loon Lake Granite, Deer Trail Argillite, and codes to easily identify where each one is located.

Q Could you identify Plaintiff's Exhibit 7?

A The difference between those two is only an upgrading

and identifying. This is more reconnaissance, and this is a more specific recitation between the later glacier, as it affects us. The Q.G.Y., the younger glacial deposits following, generally speaking, the floor line of your valley in the Weaver, er, Walker's Prairie. It generally follows the boundaries of the Walker's Prairie, and on this Plaintiff's Exhibit No. 7, it's shown where the Chamokane Creek principally lies, following Chamokane Creek -- Do you want to put it in clearer view?

Q Yes, I think it might help if we clarified the line over Chamokane Creek.

A (Following line with green felt pen.)

Q And this total area that you traced is Chamokane Creek, and this is the area of the reservation that you're showing the younger glacier deposits?

A Yes, this is the side, this is the Indian Reservation.

Q Would anyone want to get up and take a closer look at the exhibit before I ask any more questions?

(Various counsel approach the exhibit.)

THE COURT: Mr. Woodward, on Exhibit 7, would you identify both the north and south lines?

A Yes, the south line, the east line would be here, and the north line is up on, on there, on the reservation.

Q (By Mr. Germeraad) Could you take, do you have a red

marker, perhaps?
A Yes.
Q And on Plaintiff's Exhibit 7, could you draw a line along the Spokane River, which is the southern boundary of the reservation?
A (Does so.)
Q Could you also take the red marker and mark what is the 48th Parallel on the northern boundary to the Spokane Reservation?
A (Does so.)
Q Now, in reference to Plaintiff's Exhibit 7, you identified the younger glacial deposits. Could you again take that red pen and mark in that younger-glacial-deposit area of the creek which we know as Walker's Prairie?
A I believe we better start at Ford.
Q Could you just write in general where Walker's Prairie is?
A Generally by this road.
Q Now, of what significance are these younger glacial deposits in relationship to the flow of Chamokane Creek?
A The younger glacial deposits are more water-bearing in their upper layers, and also they are tighter in their lower layers. There is a more defined difference between the two, uh, layers, so, there is a more defined

distinction between the upper and lower leaves in their water-bearing capacity.

Q But generally the younger glacial deposit is the water-bearing of the underground flow of Chamokane Creek?

A The reason for that is because as the glacier receded, it tends to rinse out the upper layers.

Q Do we have some more exhibits that will help illustrate that? I'm thinking we might put up 8 and 9, and we'll put these right up --

Now, referring to Plaintiff's Exhibits 8 and 9, can you first just identify what 8 is? Describe what the exhibit is of before I ask you some more questions about the exhibits.

A I'm going to put down my reasons for it first, then I'll say what we did.

Q Okay.

A When we approach a problem we see results sometimes we can't believe what we do see, and my first concept of this whole basin is like I had a minor Spokane Valley, and I could see there a flow of possible five foot to the mile in this gradient, and I could look out north to other types of soil underneath and see it would be eight foot to the mile. Then in our wells, we measured along in this area, we find 14 feet to the mile and --

Q By this area, do you mean the Walker's Prairie?
A I'm talking about the surface water gradients all along the way to the north. It just didn't fit what we saw on the surface, or what we could see in cuts, so I felt I had to have further geophysical identifications of it, so at that time we contacted Geo-Recon, which I understand later have been taken over by Shannon & Wilson, and we had geophysical traverses run across critical areas where we thought it would be important to us. We had to identify the, we had to identify the base material, we had to identify, as much as we could, the intermediate material, and we had to identify the overburden, heavy, water-bearing materials. We did that. In the first place, so we'll be all talking on the same data, we had elevations as run all over this entire thing here, and so we could correlate them to a single data.
Q The datum is also illustrated on this map?
A Yes, the datum here all related to the United States Geologic Survey.
Q So you have 19, 18, 17, 16, 15, 1400 feet, and this is above sealevel?
A That is right. We also had them identify for us seismic resistivity. The composition of the top layer, the heavy, water-bearing level, the clay and the sand and

the gravel, mentioned in bedrock. Whatever that run across here on this profile across here and identified there.

Q The first one you identified is in red?

A That in red, near the north line, it's near the north line, along the road. The second we had identified was the one, and we crossed the nearest entrance of the valley concerned, which was about the Newhouse lane, what is known as Newhouse lane, we had one across there, and then we had a shot taken just above the spring area, and just below the spring area, and ran some spring area. We knew that the next one, they showed bedrock was at the falls. From that, it did give us, going to the profile, much of the same thing.

Q This is, then, Plaintiff's Exhibit 9?

A Plaintiff's Exhibit 9, all right. In the first place, it did get us down through the center of this, the deep points of this, it gave us the approximated bedrock profile to where it hit the Chamokane Falls. It also gave us this difference between the ground profile, which is in brown, and the possible overburden profile, which is in, or representing that. Over here, we have bedrock brown and overburden. At that time, we also, then, had the present extreme profile. I'm talking of extreme, whether it be intermittent, or not. The

extreme profile shows in blue here, and the hatched line represents the water table variation between 71 and 73, which does show why we do have the intermittent flow of the Chamokane. At that point is where we would, uh, would give us reason why we have 20 foot to the two mile, approximately, water area.

Q I will take you back just a second to Plaintiff's Exhibit 8. In the left-hand corner we have a figure up on the red and there is an indication of bedrock. Is this the bottom, the valley that is all filled in with the glacial deposit?

A Right.

Q And this would also represent the bottom bedrock and the area within the sides is your glacial deposits?

A Right.

Q And we have two individual spots here by the springs in green that are the same thing?

A Right.

Q And you said we had a loose overburden between the top line and the dotted line in each of these areas; now, can you tell us a little bit about what you call your loose overburden, as opposed to your bottom portion of your glacial fill, what are each of these zones' characteristics?

A All zones, clear to bedrock, I think we will find they

are all water-bearing. All water-bearing; and it is the degree which it will take water, and by which it will release water is what becomes important to us.

When the Public Health Service drilled their wells, they deliberately drilled through the overburden to avoid picking up of the, uh, cow-polluted water. The irrigation wells have been deliberately drilled, or incorporated into, the loose overburden, which they expect to yield a thousand to 1500 gallons.

Q What kind of yield do you get in the bottom?

A Many of our wells, where we have cased them off down deliberately through here, we get in the area of three, seven, 10, maybe 15 gallons minimum, if we're lucky.

Q So you'd characterize the lower areas as the tighter area, and the upper as the looser material?

A That's right.

Q And I believe, when you're talking about the glacial periods, you're talking about a rinsing out; can you, in reference to Plaintiff's Exhibit 9, help us to understand this rinse-out that you were talking about?

A There is sand and there is gravel and there is inter-mixture of similar material all down through here. Generally speaking, when it's glacial-filled, you have your comparables here. Now, then, as this was formed, it was formed by a series of successful moraines, as

they back up through, as this water, glacier backs up, it's potential small lakes, and it also accounts for the surface streams. Now, as the heavy outwash from these melting glaciers do take a lot of water, they are heavy-flowing, they are rotten material, they, in face, rinse out the upper layer of the upper clay material, and they leave a coarser, water-bearing, more water-releasing material. This down here, the gradient, has been affected by this rinsing effect.

Q As we go over to Plaintiff's Exhibit 9, I believe we have a portion here where you showed the stream profile, and you also show a part here of the spring; you use the glacial periods to describe the movement of water through the intermittent portion of the Walker's Prairie to the spring?

A In all probability the heavy flows during former long periods of melting the glacier, we had quite heavy washing and heavy erosion, eroded off as it is here. This receded farther in, we had the lighter erosion here and general rinsing here. We then, in effect, had a spillway between the plane of the coarse material and the plane of the finer material. At this point, now, at this grade point is where we have our Massive Springs area, as they do daylight.

Q Generally speaking, below the spring area, in the Lower

Chamokane part of the basin, you do not have the loose overfill, you just have the tighter underfill, is that correct?

A That's correct. We have walked both sides of the Chamokane, and have found no appreciable spring area affected, below the Massive areas.

Q You mentioned both moraines and rock dikes; could you distinguish between these for us, could you give us an example of what a rock dike is?

A A rock dike is very pronounced at the The main one would be at the falls of the Chamokane. Likewise at the falls of the Little Chamokane, and likewise at the falls of Long Lake. Granite, the harder materials, and a very definite, a very definite dike appears.

Q Would that dike then be the rock that was not moved or gouged away by the glacier?

A It was the harder material that the glacier couldn't shove away.

Q What is a moraine?

A A moraine is as the glacier recedes, first the glacier would come down through it, it doesn't go like a stream, it gouges out the soft materials, and rises up over the harder materials. It's a rough stream bed. As it gouges out and as it recedes, it also leaves a pile of

material, or unconsolidated materials, behind it, as it backs up, and here is where we feel the final terminal moraine was between, just south of Springdale. From then on, it found its easier path and followed, gouged the Columbia River tongue, lobe, and went down in.

Q So is a moraine similar to a, is a glacial-formed dike?

A Yes, sir. Now, as a lateral moraine also coming down there, you have it going forward in that manner, it's shoving material to the side and diking these off, canyons to the side, as well as leaving your pile in front of you, which is, if I'm not repeating myself, which is probably what diked off the Camas Valley area in the first place, making a dike area of probably 150 foot deep in there. Lake Chewelah was left at an elevation, I think, around 2200. That also accounts for the tight area and the tight soils you find in the Colville Valley.

Q If we're to look at Plaintiff's Exhibit 8, by looking at the datum, at the left-hand side, how deep, or how thick, is this loose overburden, heavy, water-bearing substance in the Chamokane Creek Basin?

A It does vary from 20 to 40 to 50 feet, maybe, as it varies from the topography.

Q Is the complete report on the geophysical information found in any of the other exhibits that we have filed

with the Court?

A We filed a complete, made a complete disclosure of exhibits that were given to me by Shannon & Wilson. Is that what you refer to?

Q Yes. Now, I'm going to hand you Plaintiff's Exhibit 29. Is it the complete study of that geophysical information located in that volume?

A Yes.

Q And then this is Exhibit 3-6-74-29. Is it also found in, I'll give you this and ask you to examine this. Is that report also found in that report?

A It would be in this.

Q This may be somewhat of a repeat, but could you tell us about the relative permeability of these two layers of materials that you find in the Chamokane Creek Basin?

A (Witness hesitates.)

Q Its loose overburden, and your --

A Without looking at my detailed studies, I know that we have, there is a wide variance between the top overburden and the tighter underburden.

Q Okay. Now perhaps we can, I would like to have you describe for the Court how the hydrologic system of the Chamokane Creek fits together, starting with the precipitation recharging the ground water system, tell us

where the water is contributed to our entire system, where does the water come from, and perhaps you can use Exhibit 10, there, that is up on the board?

A Generally speaking, the input would be the output. This whole basin, with the exception of transformation or evaporation, it is all going to come out at the south gaging station.

Q That would be your measure of output, then?

A Right. It also has to come in somewhere along this, this may vary, which perhaps varies from and has varied from two years of a heavy precipitation year to where we feel it affects down here, to where it goes through this whole system.

Q Could you just tell us, perhaps -- Just a second, I'd like to get one exhibit back up here again.

I'm putting up alongside Plaintiff's Exhibit 10, Plaintiff's Exhibit 3. Plaintiff's Exhibit 3 shows the elevations and runoff and precipitation. Now, with reference to both Plaintiff's Exhibit 3 and Plaintiff's Exhibit 10, could you start us at the Upper Chamokane, or Camas Valley, and tell us how water is contributed, and in what form that water is contributed, to the basin?

A In the upper reaches, there are heavy snow packs, to the higher mountain ranges, up in here. You get down

to the lower regions, the Camas Valley, we get many times warm periods, chinooks, and runoffs during any season, December clear through the winter. It gets down there, coming in that lateral moraine and into the drainage of the Walker's Prairie. During our flood periods, where our floods have heavy snow or water runoff, we get a high runoff, it carries through here, and carries completely through your intermittent springs and clear down through here.

Q What about during the non-flood period?

A We have had maybe one, two peak at our gaging station here, what we have had here for several years.

Q That is what comes from the Camas Valley?

A Comes from the Camas Valley. We get a considerable run-in, and we recognize it, into recharging this basin, from the side wash, both sides, coming down into the streams which deadend at the edge of Walker's Prairie, most of which do. Some of them do make it through. Most of them do. Now, any waters that we may feel coming into here, if we feel that it enters, we feel that it charges our reservoir, our inner bank, water bank, we feel this water coming in here makes a water bank, we cleanse out by pumping this area.

Q Now, is there something you get, a contribution, from

the flats in Walker's Prairie as well?

A Very much. Probably 2000 acre feet from the flat itself.

Q In quantity, how much recharging for your water bank there do you get from the hills surrounding the Walker's Prairie?

A Probably -- The way the runoff occurs, we probably get as much as 8000.

Q How many acre feet do you get from the flood periods, or the runoff periods there, from the Camas Valley; how many acre feet of water?

A That actually help us?

Q Yes, that actually goes into recharging of Walker's Prairie?

A I think I'm going to have to go back to my book and see.

Q Why don't you go back and see if you can --

A It isn't a major part during, more particularly during our irrigation season.

Q Okay. Well, I'm going to ask you two things: First, I want to know how many acre feet of recharge to the Walker's Prairie ground water system comes from your flooding out of the Camas Valley?

A To the recharging, I think I have a figure of 700 acre feet, and I'm trying to reconcile --

Q Would the 700 acre feet be what is contributed during

your, your summer flow from the Camas Valley?

A That would be your summer flow contribution.

Q How about the contributions during the flood season, how much do you get?

A That is the figure I'm trying to -- I'm going to have to have that shown to me here. That will have to be given to me so I can identify it.

THE COURT: You have to what?

A He will have to bring it to me so I can identify it.

Q (By Mr. Germeraad) Maybe I can.

A I think I can come closer, about 8000 feet. About 8000 acre feet would be --

Q Then into the recharge area, we get 8000 acre feet from the Camas Valley runoff periods. From floods, we get about 700 acre feet during the normal irrigation, or the spring-summer-fall time. We have 8000 acre feet off the hills, and 2000 acre feet off the flats. Now, that brings us to about 18 or 19,000 acre feet that goes into the Walker's Prairie recharge system. Now, where does this water come from?

A That water all has to go through and come by our gaging station, and it totals about 34,000 acre feet.

Q So 34,000 acre feet goes through your gaging station; was that a particular year you're thinking of, that you measured?

A It was what went in our computation as what we would recognize as our more-nearly-normal year, compared to the long-time average.

Q Now, the 34,000 acre feet is somewhat, is more than your 18 or 19,000 acre feet that goes into your recharge; where is this difference; what causes this?

A The flood flow that gets away from us.

Q Okay. Looking at Plaintiff's Exhibit 9, which is up on the board, this area between the brown line on the top and the orange line a little underneath it, is that your recharge area; is that correct?

A I believe the brown line represents the, is the brown line the surface line?

Q Yes.

A I think it would be somewhat below that, in that area, in the hatched area, is where it varies.

Q This point also, on Plaintiff's Exhibit 9, we have a place designated as "spring". Now, how does the spring area relate to your ground water recharge in Walker's Prairie?

A We have had a 10-year record supplied us of the Hatchery Springs, of which would be 7.3, well, actually, it would be the 30 years.

Q Before we get into that, just to clarify the record, the 18 or 19,000 acre feet that goes into the Walker's

Prairie recharge area, does this come out the Massive Springs area which we have mentioned on the Plaintiff's Exhibit 10; is that the --

A The major portion of it, yes.

Q And if we have 18 or 19,000 acre feet coming out of the springs, is this our base flow, then, for the Lower Chamokane?

A That would be our base flow for the Lower Chamokane, yes.

Q Okay.

A That is the Hatchery Springs plus the Galbraith Springs and the major spring area.

Q Perhaps this running out at the springs, is there another simple analogy that you could explain to the Court to help us understand how the water comes out at the spring area?

A Engineers always get themselves in trouble when we try to make an analogy that is real simple, and this seems so simple to us that I hate to do it, but it's like this valley does work as if we had a sponge lying on a blotter, and we can recognize that it's not an exact plain, but generally speaking, the materials are comparable to it. The sponge fills with water easily, and depletes with water easily. The blotter is also full of water. It fills very slowly, and you deplete

it very slowly. Now, at the point of daylight, where the two intersect, this erosional bluff, so to speak, at the spring, that is right before the spring, is where we find the major flow of these springs.

Now, this works two ways, this sponge on top. This sponge is expected to carry a stream which is coming down in floods, and, consequently, it does come down, all conditions being perfect, it would go right out and spread out immediately. If it's frozen, or if there are other reasons, it fills our wells, our test wells, very fast, those that are more nearly adjacent to the stream line or surface line of the Chamokane. During those flood periods, we find that our, where I have shown a straight-across water deal, it tends to pile it up in the middle, and you get the water running transverse. Immediately following that, within days, we find that our wells tend to drop off in this leveling-off process. That is in part to trickling down into the blotter. It's a part to going transverse as well as longitudinal along that valley layer.

Now, the same thing can occur, and we have got to recognize that it occurs. In the early transient runoff periods, when we have a heavy runoff, chinook forms, or by what, along the edges of the Walker's Prairie, and up the side hills of the valley, the Walker's Valley.

At that time we get a heavier runoff in the sides of our sponge, and it tends to run towards the creek, the present creek.

Q Okay. Could you come over here to Plaintiff's Exhibit 10?

A (Goes to board.)

Q This is the top of the reservation. Now, if the water running out of the Camas Valley enters the creek where this sponge of Walker's Prairie here, where is the exit point, where is the Massive Springs area?

A (Indicating.)

Q Okay. So, generally, the water, then, running in a southwesterly direction?

A Right, generally.

Q All right. Now, you talked about a time when the ground water system was pervious or higher. Could you show us on this map what you're talking about?

A If we get enough heavy flows in here, this is able to absorb immediately under, in its channel. It will tend to run out and tend to fill what we termed here as our Walker's Prairie. When that is receded, we tend to get some out. This was borne out by our monitoring wells. We did get a high peak and sort of a recession as it started catching up. By the same token, when we get a chinook and heavy runoff, in here,

before the Camas Valley is here, we can also get that strange condition of a filling here and a lag in this until it catches up.

Q In other words, sometimes, when the water is coming out of the hills, the water runs down toward the creek rather than --

A It could, yes.

Q Okay.

A It runs down towards the creek and in almost every case I have seen, I have seen this, these running into the creek, and in most cases, it runs down to the , tends to fill up the valley, and tends to fill up the basin.

Q Okay, going over to Plaintiff's Exhibit 9, where you have the hatchmarks illustrating the area of the stream profile, I notice there is a number 110 that seems to be at a slightly higher elevation than the stream profile preceding or following it. Could you explain that to us, and then why that is higher at that one point in time, or in space, I should say.

A (No response.)

Q Do you understand my question?

A I haven't got the answer to it yet.

Q Is Well 110, could you show where Well 110 is on Plaintiff's Exhibit 7?

A It would be about
I think probably the reason that Well 110 is there, we're getting side effects from that.
Q Now, is Well 110 near where the surface flow of the Camas Valley is deposited into your Walker's Prairie?
A Yes, it would be in that system.
Q So this is more or less the drain where the water is going in?
A Yes, of the whole bunch of the wells, that is the only one that appeared erratic. That is all I can characterize it.

THE COURT: Counsel, this may be a good time to take our lunch break.

(The noon recess taken at this time.)

Hon. Marshall A. Neil, Judge
Spokane, Washington
Monday,
March 11, 1974
2:30 P.M.

(Direct Examination continuing)

Q (By Mr. Germeraad) Mr. Woodward, is there one point in the Chamokane Creek Basin through which all the water flows?

A Where it flows through the granite dike just above our gaging station.

Q Could you go to Plaintiff's Exhibit 10 and show that to us, please?

A The gaging station is about a mile above the

Q And the falls are right above that gaging station?

A Six or 700 foot above the gaging station. The only reason it wasn't put at the falls, it was

Q Of what significance is that falls to funneling all the water to that one point?

A We have a continuous dike going through Long Lake Falls, Chamokane Falls, and the Little Chamokane Falls. Everything that falls in this area goes down through that one point.

Q Now, earlier today, you talked about the contributions of the various portions of the drainage basin and what contributions they make to the ground water recharge.

I believe you stated that was based on the actual experience in 1972. Could you go to these blank sheets of paper on this next board, over here, and give us the figures for the water year 1972 and show us how all these different amounts total your complete flow?

A From the Upper Chamokane and the Camas, we feel we will get about 8000 acre feet, and then we feel that we would be getting about 700, which was a measured flow, from the north line.

Q Would you point to 10 and show us where that is on Plaintiff's Exhibit 10?

A The Upper Chamokane, at this point; the gaging station at this point.

Q This is the north stream gaging station?

A This is the north stream gaging station, which is less than a half a mile below the north boundary.

Q So that 700 is the amount that was measured during the summer?

A That is the amount we measured directly over the We now have, of course, a heavier flow, for flood flow. We have the U.S.G.S. gaging station there also, but at the time, this is what was coming down through. In the Walker's Prairie, we would get about 2000 acre feet. That would be this bottom area, like in here, within the green, in the flatter area.

Q If we were to look at Plaintiff's Exhibit 3, right next to that, would that be the white area then?

A Yes. Then we recognize, especially in our transient runoff, we get earlier in the season, from chinooks and other reasons, and we'll call that adjacent. We feel we can get 8000 acre feet from that.

Q These are the hills surrounding the Walker's Prairie?

A These are the hills lying between, on this I indicated what you call a line here separating these, and it would be from these areas to the east and farther to the west, coming down through, you get a result of that, these flowing down in this watershed, or it would be, end up in our bank, the water bank. That ends up as 18,700 acre feet.

Q That is the portion that goes into the ground water system?

A That would be the portion that would be going into the ground water system. Now, should I go on into the overall contribution of a typical year, which was a '72 year, which will end up in something like 35,000 acre feet, I'm rounding these figures, and I'll, it still leaves us in the 16,300's, which we know, or we assume, has run off in flood waters, on down past, on through, past, on through a large portion, from here, carrying on down through.

Q Okay, would you label the 16,300 acre feet as runoff, please?

A That's runoff.

Q Where does it, this 18,700 feet, acre feet, that goes into the bank, where does this come out of the bank, or does it?

A The only place it can come out, and it's within, probably within the mile below Ford, through the Massive Springs area.

Q Okay. So would you label, then, the 18,700 as output through springs?

A (No response.)

Q Now, if we were to take the 18,700 acre feet and convert that to a flow in terms of CFS, approximately what type of flow would that mean that we were getting out of the springs then, in 1972?

A Probably in the area of 25 CFS feet.

Q Would you, right down at the bottom there, indicate 18,000 represents 25 CFS?

MR. GERMERAAD: Your Honor, if I could have this exhibit marked and use for illustrative purposes only, I think it would aid.

THE COURT: Any objection to the introduction?

(No response.)

THE COURT: What is the next exhibit number?

THE CLERK OF THE COURT: Thirty-one.

THE COURT: Thirty-one. Plaintiff's Exhibit 31 will be admitted for illustration purposes.

Q (By Mr. Germeraad) Could you tell us how you arrived at the various amounts of acre feet that were contributed to the Walker's Prairie ground water system? Perhaps you could use Plaintiff's Exhibit 3 there.

A Well, we have to take in several factors; we have to take in precipitation, and slopes, how it comes in, and generally speaking, we have got our total runoff anticipated from the portion of the total rainfall we expect here, and for example, up here is about, say, 2000, 2500, we may assume 2.3 to four inches or less that would be yielded.

Q Earlier today -- I think that is probably all we will need at the board -- Earlier today, you discussed two different strata of the glacial field we find in Walker's Prairie. Now, are these two different layers we talked about uniform in nature in themselves, or in relationship to each other?

A The lower layer is quite uniform. The upper layer, the more pervious layer, is very un-uniform. We find variations from place to place, just as you find in a meandering stream, you find tighter layers, and coarser layers, as you go down through.

Q Generally, how would you characterize the uniform lower layer?

A More of a sandy, with some gravel, clay layer, very tight.

Q And the upper layer?

A The upper layer, variable, but very loose.

Q I think earlier today you mentioned a gradient of 15 feet to the mile. Does this particular gradient apply to the entire Chamokane Basin, or just a portion, are you talking about?

A The Walker's Prairie area, both the hydrolic gradient and the surface gradient, are not too far from the 15 feet to the mile. We drop off at the Ford area, and from there on down to the falls, it would be about 36 feet to the mile, as an average.

Q What is the general direction of the gradient throughout Walker's Prairie?

A Very generally, it's south and west.

Q Why are the springs, or why did the springs exist where they do; what dictates that the springs are at a particular point?

A I hate to return to my blotter and my sponge, but it's at that layer, where the more pervious lower layer, er, upper layer intercepts the lower layer, and that's the weakest point, and it follows it down, and that's where

she does break through daylight.

Q Do we get any ground water contribution out of the Camas Valley, moving on down into Walker's Prairie?

A I don't feel we get any material underground water in that I'm not able to measure any major flows at the north line. It's very minimal if there is.

Q In addition to your measuring, are there any reasons you feel we get little or no ground water out of the Camas Valley?

A The way it was formed, and in all probability, was a lateral glacial moraine which pretty well sealed it off and then broke through and left a channeled path for it to clear draining. We get little effect from the ground water at Camas Valley.

Q Mr. Woodward, I'm going over to Plaintiff's Exhibit 8, and we have these hundreds of feet in the lower, tight strata which you have talked about; with that in mind, do we get any ground water contribution out of this area into our spring flow?

A I don't believe we get any into our fish hatchery spring flow, although there are water, they have water, they're pervious, there is water in them, and they are available to small domestic water wells. There is water there; it's hard to get out, it's hard to get in.

Q So if there is any contribution, it would be secondary

to the --

A It would be very minimal.

Q During a period of flooding in the Walker's Prairie are, what happens to the water, I mean, could you picture for us what Walker's Prairie looks like during flood conditions, and how the actual recharge takes place?

A I think I pointed out earlier that we had drilled four monitoring wells, beginning the first one right close to the, what we had presumed the spillway, the south well, and then we drilled one at the Brunton Well, which is right across from the Seagle Well. We had one drilled immediately adjacent to the Hill Well, which was our long-time continuing monitoring well, and then we drilled one near the north line.

Now, when the flood comes down, comes down through there, we find it almost an immediate peak rise in those wells, in all of the wells. Then we find, as they fill, and as it either drizzles down into the lower part, or as it spreads out into the basin, we find a decided drop in all of our monitor wells, with a spread-out, intend to level out transverse to this longitudinal gradient that I'd spoken of. Now, I think it could be also a reverse of that condition, were we to have a low flow in the stream as we see it, the

channel as we see it, and if we had a heavy spring runoff, chinook, we could also find a trend for the water to slope in towards that.

Q You're talking of sloping in from the hills?

A Yes, coming in from the hills, but in a very little while they do level out and take the long-time trend of heading southwest towards the spring area, the final spillway.

Q During this flooding, is then Walker's Prairie, is it filled with water, is it spread out over the area, or is it confined to a channel?

A It is full. As of now, it is full.

Q What is full, the channel, the valley -- ?

A The valley, the valley water table is full. We have got a full flow in the Chamokane, on the surface of the Chamokane.

Q Would any channelizing of the stream basin, in Walker's Prairie, or any side dams, have any effect on the ground water recharge?

A It would have an extreme effect. It would be a major effect, in that this stream, as it cuts down through and meanders, has made our thinnest soil mantle, and has made it more susceptible to recharge. Anytime we cut off any of the obstacles, or any of the area of the rechargeable area, by area, we have diminished the

amount of water, and the rate of return into the ground waters.

Q Does the term influent stream, is that in any way applicable to Chamokane Creek?

A The influent stream is where it would be flowing into this underground stream, as I refer to it, and the affluent stream would be where it leaves it and becomes another surface stream again.

Q So where is Chamokane Creek an influent stream?

A Chamokane Creek is an influent stream about a mile and a-half, two miles south of the north border, and it becomes an affluent stream at the falls, er, at the spring area.

Q To make the record clear, you have used the term base flow; what is the base flow; to what part of the stream does it apply, and where does it come from?

A I term the base flow as that dependable flow that we're able to expect from the spring area, and from there on to its mouth. And do you mean to have it defined separate from minimal flow?

Q Well, do the base flow then come from the springs, is that it?

A Yes, basically.

Q How is the ground water recharged in the Walker's Prairie, related to the base flow?

A Slowly, but directly.
Q Would any withdrawals from the Walker's Prairie ground water system affect the base flow?
A Any withdrawals in the Walker's Prairie area, or the streams running into it, immediately to it, would affect the base flow of the spring.
Q Earlier today, you mentioned several categories of studies and measurements that you did in the study that you prepared for the Spokane Indians, and I believe we have covered the topography, and the geological studies, and I think we have covered the importance of the different wells that are drilled and monitored; what other study is important to the understanding of the hydrolic; what other factors enter into it?
A I need a little more lead than that.
Q Did you study the precipitation records of the area?
A You bet. In this study, we have a short period of physical measuring of streams, of the stream itself. We have longer periods of which we have records, correct records of the flow of the Hatchery Springs. We have a still longer period for which we have a complete record of the precipitation. We have then started with our known records, our recorded records, and related them to the records of which we had the next-longest period of time of records, which would be the flow of the

Fish Hatchery Springs, as supplied us by the John Biggs' office, or the Fish Hatchery personnel.

Q Starting with, I'm going to now hand you Plaintiff's Exhibit 24, 25 and 26. Could you tell us what Exhibit 24 is?

A Exhibit 24 represents the monthly inches of precipitation, by total, and by year, and comparing them to the average of the '31 to '60 records, the '61 to '70 records, and the long-time, '31 to '70 records.

Q These precipitation records, what source did you use to compile these records?

A We got these records from the Washington Climate WSU EM 2945 and from the U.S. Department of Commerce Weather Bureau records.

Q Going to the left side of the page, this indicates the month of the year for the precipitation?

A Right.

Q The next column over, I see a 1931 and a 1960; what is that?

A That shows the long period variation in the, or the average of the '31, or 36 average, that's a 30-year average there.

Q This is the average precipitation for 1931 to 1960, by months?

A Right.

Q Then we have another series of columns, could you tell us what these are, there are about 10 columns?
A Year by year, and how these vary from that.
Q What years are the precipitations given month by month?
A '61, '62, '63, '4, '5, '6, '7, '8, '9 and '70.
Q Okay. Then the next column there, is what?
A That is the average of the '61 through '70.
Q So that's a 10-year average precipitation?
A That's a 10-year average precipitation.
Q The next column is what?
A The next column represents a 40-year, or a '31 to '70; the long range.
Q Then the last four columns is what?
A The last four columns represent the current years we have been keeping our records, which is '71, '72 and '73.
Q What about the last column, what do we have over there?
A We started in '74 and we got it, bam.
Q Now I'm going to hand you Plaintiff's Exhibit 25 and ask you to describe what that is there?
A That is a comparison table to the cumulative precipitation for the water year from the Wellpinit weather records, taken from the U.S.D.C. Department of Commerce Weather Bureau.
Q The first column gives you what?

A The first column gives us the '31 to '70.
Q That's the precipitation?
A For the month and cumulative.
Q Throughout the year?
A So, at the bottom of the column, it would give you the total amount of precipitation, cumulative, average, each year.
Q Okay. The next series of columns give you waht?
A The same thing for '71, '72, '73, '74.
Q Okay. This last exhibit, which is Exhibit 26, can you tell us what this is?
A This gives the snow course of Togo Mountain, snow on the ground, that's snow course 18 A 10. Also carries from '62 on through '74.
Q Okay. Now, the snow is measured at that snow course at precise times. What are those three times?
A In February and March, then April.
Q The first of each of those months. Now, do they measure both the snow and also give you the water content?
A They give the water content of that snow, yes.
Q There is another, the second page of Exhibit 26 gives you what?
A There we have the Wellpinit weather station snow on the ground at Wellpinit.

Q That gives you records from what year?
A '62 through '73.
Q The last part of, the third page of Exhibit 26 is what?
A Is Stranger Mountain, and that is a little far from our course.
Q But it gives you what?
A Does the same thing, from '59 through '74.
Q It gives you the snow?
A The same, snow, and its rain equivalent.
Q Okay. I'm now going to hand you Plaintiff's Exhibit 19 and ask you to describe what that exhibit is?
A Exhibit 19 is the flow of the Fish Hatchery Spring from a particular Weir of which we do have a long-term record on. We have the weir on 1961, which was kept quite precise. Then we have the same weir, '71, '72, and starting on '74 -- '3 and '74.
Q Okay. So from the period of time when you first started your study, and let's say this is the beginning of 1971, then we have continuous precipitation records, is that right?
A Right.
Q Do we also have continuous records of the flow of Chamokane Creek?
A Right.
Q And do we also have continuous records of the flow at

Fish Hatchery Springs and precisely this one particular weir that you paid particular attention to?

A Yes.

Q Now, did you, having these three different sets of measurements as to the water in the basin, have you correlated or established a relationship between the, let's start with the flow in the Fish Hatchery Springs, with the base flow in the Chamokane?

A Yes.

Q And could you tell us what that relationship is?

A About 21 percent.

Q What is 21 percent, of what?

A This particular spring which we are running here is about 21 percent of the total flow as gauged through our gauging system at the lower gaging station.

Q So if we look at Plaintiff's Exhibit 19, which is Weir Number One at Fish Hatchery Springs, and we look at how that is flowing, in other words, as an approximation, if you multiplied that by approximately five times, that would give you your base flow in Chamokane Creek?

A That is correct.

Q And this is what is picked up at the lower gaging station, right there below the falls, this is the flow?

A That is correct.
Q Since we have records of the flow at Fish Hatchery Springs -- Could you first tell us what the average flow at Fish Hatchery Springs has been during the time of 1971, and then could you tell us as to '72 and '73? First, as to 1971?
A We put arrows on it, right here, to indicate what the average would be. In '71 it would be right on six cubic feet, cubic feet per second, and '72 it would be 57, 56 or 57.
Q You're talking about 5.6 or 5.7?
A Yes, sir. And in '73 we find it would be about 4.75 cubic feet per second.
Q What was it in 1961, the average?
A For '61 the average would be 7.6.
Q Would you look at that again, is that 7.6, or is that some lower amount?
A I misread it; it would be 7.3-something.
Q About 7.3. Using the relationship between the flow at Fish Hatchery Springs and the base flow of the Lower Chamokane, could you give us your best judgment as to what the base flow of Chamokane Creek was in 1961?
A It would be that divided by the 21, or it would be about 33 or 35 percent, or cubic feet per second.

Q So, between 33 and 35 CFS would have been flowing in 1961?
A Yes.
Q And yet we had less flowing in '71 through '73. Is there some reason for this; why the decrease in the flow between 1961 and the '71 to '73?
A We have some, we got a charge-off on our precipitation, but the rest has got to be man-made, by water taken from the drainage.
Q So, part of the decrease is due to a drop in the precipitation, and the other part is due to --
A Evidently based on pumping from the basin.
Q You earlier said you also made a correlation of the base flow and the precipitation records, and I believe we have precipitation records that go back to 1931. Could you give us an estimate, then -- Well, why don't we start with just one particular decade, and that would be 1961 to 1970; what do you estimate the flow of the Lower Chamokane was during that 10-year period of time?
A Umpteen years, but I still need the figures, but I think it's in the area of -- I'd better wait for them.
Q First, I want you to identify, what is this huge blue notebook?

A It's my brains.
Q Well, isn't this information that you, background information that you have worked out?
A Yes, in order of performance.
Q Okay. Using the blue book, which is the background and backup information for your study, is there something in there that can help you tell me what the estimated flow of Chamokane Creek was, the base flow, between 1961 and 1970?
A Thirty second feet.
Q What do you estimate the flow would have been over a longer range, let's say 1931 to 1960?
A Over a longer range, from '31 to '70, would have been 33, probably, which would have been due to precipitation.
Q I asked the question as to '60, and you gave me the answer as to '70, so I ask you, from 1931 to 1970, the average flow in the Lower Chamokane would have been 33 CFS?
A Yes.
Q Since the flow between 1960 and 1970 was only 30 CFS, would the flow from 1930 to 1960 have been somewhat above 33, to bring it up to that average over a 40-year period?
A Yes.
Q Now, is the base flow that you have been talking about

the same thing as a minimum-stream flow?

A No. There are other factors that do enter in; daily factors.

Q So what is the difference between the two, if you would explain it to us, please?

A In our recorded differences, where we list specifically, of course, we find as much as two to two and a-half second foot differentials during the day, so your minimal would be a matter of two second feet less than your basin. When I say the basin, the geological survey put down a basis for the flow, we draw a line here, and balance it out, but there are dips below, usually in the hot afternoons, where we have a drop due to evaporation loss, and others, too, to two and a-half second feet.

Q You have already indicated that some of the drop between the flow at the Fish Hatchery Springs during 1961 and 1971 would have been due to man-made causes, or pumping. Could you give us an example of the particular pumper that might have affected, in part, that drop?

A It would be the Newhouse well.

Q Well, how about Mr. Seagle, he is also a user of water.

A The Seagle well was not used in the comparison, he was drawing prior to 1961. He would be drawing from the

volume, but he wouldn't be in comparison.

Q So the difference between 1961 and 1970 would not be due to Mr. Seagle, because Mr. Seagle was pumping at both times?

A (No response.)

Q You gave us your technical conclusion of the base flow of about 33 CFS over the past four-year period of time. Is this conclusion supported by all the other information that comes to your attention about the flow of the Lower Chamokane in this period of time?

A Yes.

Q I think we now would like to talk more about the effect of the various withdrawals from the Chamokane Creek drainage basin. Did you make a study of the certificates, permits, and applications that were on file with the State of Washington for water use within the Basin?

A Yes, we did.

THE COURT: Mr. Woodward, I'm not sure I got one point of information correct. You said the Seagle well was drawing at the beginning of the study period, and at the end. Were you talking about '31, or '61, which period?

A That was prior to the '60's. '61, period, yes. That was only for comparison, in that withdrawal. It is in

the withdrawal, but not in the comparison.

Q (By Mr. Germeraad) Now, I have placed up on the board Plaintiff's Exhibit 14. Would you go on over to the board, now, it may be helpful. I'm going to ask you a few questions about that exhibit.

In the upper, or right-hand side of this exhibit, we have a listing of certificates and permits. Could you tell us where you got this information that appears on this exhibit?

A Many of them I got directly from the predecessor of the Department of Ecology, and the Department of Ecology; some of them I got through

Q Okay. Here we have SWC; what does SWC mean?

A Surface Water Certificates.

Q All right. And we have here a GWC; what does that stand for?

A Ground Water Certificate.

Q And down here, under Permits, we have GWP; what does that stand for?

A Ground Water Permit.

Q Now, there is a series of numbers after the SWC, GWC, GWP, and SWP?

A Those are certificate designation numbers.

Q You have another column here that says Location; what is that?

A The location on the stream, the diversion, and the water they use.

Q And then we have a column called CFS; what is that?

A Cubic feet per second, that were used on that, and this information comes from the State's Ground Water Permits or Ground Water Certificates.

Q Okay.

A And the acre feet would be where the permit or certificate, often in terms of acre feet, as well as CFS.

Q Okay, going to the left-hand side of this exhibit, we have little boxes with designations all throughout the Chamokane Creek drainage basin; what are these?

A Those are our best knowledge of locations of these certificates and permits, as designated by the State

MR. GERMERAAD: Perhaps this would be a good time to take a break, for everyone to come up, these would be all of the interested parties, to see if they want to make any objections, this would be the appropriate place.

THE COURT: What is the difference between the certificate and the permit, as far as your analysis?

A The certificate has been certified by the State for use

and the permit is still under a cloud.

THE COURT: We will take about a 10-minute re --

MR. GERMERAAD: That concludes our --

THE COURT: -- 10-minute recess, and let counsel examine the exhibits.

(A short recess was taken at this time.)

MR. GERMERAAD: Your Honor, before we begin to talk about Plaintiff's Exhibit 14, I'd like to point out something about a certificate, GWC 4891 A, for 2.56 CFS, for 1400 acre feet. It came to our attention that, during the recess, that information that we were previously given by the State Department of Ecology, in draft form, listed that as 1150 gallons per minute, which would correspond to 2.56 CFS, or 1400 acre feet.

And also in the records filed by the Department of Ecology, with the Court, there is listed as a permitted amount, the same 1150 gallons per minute, which would be the 2.56 CFS. We were informed by the State Department of Ecology that is incorrect because the two files they filed with the Court were not complete, nor was the draft which they provided the plaintiff correct, so any computations changes we would like to not do in the hurry of the courtroom, but do

overnight.

THE COURT: Whose permit is that?

MR. GERMERAAD: This is Mr. Seagle's permit.

THE COURT: All right.

MR. GERMERAAD: Or certificate. And any changes, we would like to enter tomorrow, to the Court.

THE COURT: All right.

Q (By Mr. Germeraad) From what area of the basin are we primarily concerned about water being drawn from, Mr. Woodward?

A We are concerned about all areas, primarily that within the Walker's Prairie.

Q What type of withdrawals are there in Walker's Prairie?

A In Walker's Prairie, there are ground withdrawals.

Q Are there any surface water withdrawals in the surrounding area of Walker's Prairie; I see one listed as 3386, Surface Water Certificate, in the hills, on the east of Walker's Prairie.

A Where we find surface water withdrawals adjacent to Walker's Prairie, we consider them in its effect on the creek the same as if they were ground water withdrawals, in that we feel they go directly into the ground water area.

Q What about withdrawals from the Upper Chamokane, or Camas Valley? I believe we have --

A The same thing goes. We have all surface water, and the same thing goes.

Q And that is because all of the surface water must get, will enter and go into the ground water system on Walker's Prairie except that which runs off during the floods?

A That's correct.

Q We also have some surface water diversion here in the Lower Chamokane; how do those affect the flow of water?

A We compute those as a direct water-for-water. It's a direct diversion.

Q And those that go through the ground water system, there is simply a time lag --

A A time lag which reduces them somewhat. And in that point, maybe we should put in the non-use one, the nonconsumptive use one of the Fish Hatchery.

Q So Surface Water Certificate 2831, for 10 cubic feet per second, that's the Fish Hatchery?

A Yes.

Q You said that is nonconsumptive; why?

A That is nonconsumptive because, except for just what might evaporate off the fish bowls, why, would be trifle. It returns to --

Q It returns immediately to the stream.

I think we should start by taking one example and

having you take it all the way through, one specific example of ground water withdrawal, and I think I'd like you to talk about Mr. Newhouse's withdrawal.

I'm going to hand you Plaintiff's Exhibit 23-A, 23-B, and 23-C, if you want to use that, and perhaps you might also want to refer to Plaintiff's Exhibit 18.

What studies did you make to determine the effect of Mr. Newhouse's ground water withdrawal upon the stream flow in the Lower Chamokane?

A Starting in 1971, we had an off-on meter placed on Mr. Newhouse's pump so it showed when it was off, when it was running, when it wasn't running. We had placed a float control recording device in Well 112, which is the Hill Well that I'd referred to, which is directly across, about a quarter of a mile, from it, which, which paralleled time and rate, so that we could determine a relationship of withdrawal to a rate of change of slope of gradient, as the water would diminish as it would go down through the valley.

Q Okay. During the summer, when you would have your irrigation season, what would be the behavior of Hill Well 112 in the absence of any pumping by Mr. Newhouse; does it stay the same, does it go up, does it go down, and at what rate?

A There will always be a rate, as long as you have flow

in the stream, there will always be a rate of decline of the gradients, it will always be sloping down.

Q Is this because there is no input coming in at this time in the water?

A Because at that point, our input is minimal, one, two second feet down, and the outflow is the total flow of the springs, so we therefore have a decline in the water table all the way through.

Q What would be an average day decline in that water table in that Hill Well 112 in the absence of any pumping?

A I had the figure, and it seems like 15,000, but I'd have to check that.

Q Would you please go and check with whatever information you need? I'll bring up this large blue book of yours, your background studies, and whatever you need.

A I wish my blue book hunter was here with me, to find it.

During the summer when Newhouse pumps his well to irrigate --

Q In the absence of any irrigation, what is it?

A All right, in the absence of any pumping of water, the table drops fifteen thousandths of a foot per day. This is a natural decrease, and it's due to keeping the springs flowing, and maybe other diverters.

Q Okay. When Mr. Newhouse pumps, what is the effect, then, on that Newhouse well, which is only, the Hill

Well, which is only one quarter of a mile away?

A Between 30 and 50 thousandths of a foot per day; between two and three times the normal daily decrease.

Q How deep is, or to what depth is Mr. Newhouse's well perforated, or where does Mr. Newhouse's well withdraw water from originally?

A I believe the well is drilled to 65 feet. I'm guessing at part of this. It's drilled to 65 feet. The perforations are within the porous layer, which are in the 30 to 50-foot area.

Q So the --

A I'm taking hearsay on it, and I have not punctured it.

Q Did you have a well log in your office?

A Yes.

Q Is there anything in that blue book that could help verify for you, without precisely, how deep his well is drilled and where the perforations are?

A I'm sure there will be. When Ira gets back, he will find it for me. It is in the area of the porous layer, that is where we perforate.

Q At what rate does Mr. Newhouse pump from his well?

A From the number of heads, I would presume, or I would compute, from 1000 to 1500 gallons per minute.

Q This would depend on how many sprinkler systems he is using?

A Averaging probably 1200.

Q Earlier, you said you had collected the data from the on-off meters, and --

A Yes.

Q -- the data from the Hill Well, and from Mr. Newhouse. Would you please describe the total effect of Mr. Newhouse's ground water pumping on the stream flow in the Lower Chamokane?

Maybe it would be helpful to take one year at a time, telling us how many acre feet he withdrew, and then tell us how, in principal, that affected the flow in the Lower Chamokane?

A I think in the first, I have to compare it to the well, Number 112, and how the slopes vary from year to year, and I'm able to directly correlate, within days, when the pump goes on, to the rate of change of slope. When the well is shut off, it doesn't bounce up, and continues, it continues at that point, and continues on down as a similar slope as the average, the year's annual slope, without pumping.

Q Do you have some record of the number of acre feet that Mr. Newhouse pumped in 1971?

A Mr. Newhouse pumped 545 acre feet the first year, in '71.

Q How about '72, how many acre feet would he have pumped

that year?

A Without looking, 230.

Q Could it have been about 240?

A I'll go 240.

Q How about in 1973, how many acre feet did he pump?

A I believe that would be 330.

Q 315, maybe?

A There you go again, 315, all right.

Q Okay.

A I should have looked at my figures.

Q Is there something in your records that can tell you, or by reference to something, how many acre feet is the total amount of the permit, is he permitted to pump during a year?

A It's shown on that (indicating).

Q Could you come over here and show us, please?

A (Does so.) He is permitted 3.34 cubic feet, or 648 acre feet, per year.

Q Okay. Mr. Newhouse uses sprinkler irrigation, is that correct?

A Right.

Q Is there any appreciable recharge of the ground water when you use sprinkler irrigation?

A In effective sprinkler irrigation, there is, we may assume no return flow.

Q How much, then, did Mr. Newhouse take from the flow of the Lower Chamokane by his pumping in these various years?
A It would be the result of those three figures.
Q So what you're saying is that every gallon that he pumped would otherwise eventually all come out in the spring flow?
A It would have had to, yes.
Q You mentioned some time lag, how much time lag would there be, in effect, between his use and its effect on the spring flow?
A If it were a homogeneous mass there, I think we could determine exactly. As it is, we can presume that we may get as much as a year's time lag in the effect of Mr. Newhouse's well on the spring flow.
Q So if Mr. Newhouse were to remove his permitted amount of 680 acre feet in a year, how would this decrease the flow of the Lower Chamokane?
A A like amount.
Q If that were expressed in CFS, how much CFS would the flow be reduced?
A Acre feet, let's see, about, it would be about a second foot would probably be affected, because it's flowing the year around, and Newhouse is irrigating probably three, three and a-half to four months, along

in there, so it would be a second foot.

Q Second foot less, or second foot more, or what?

A Second foot.

Q Now let's take another example of, this time let's use a surface withdrawal, and perhaps you could talk about Mr. Smithpeter's surface withdrawal; would you please tell us how his surface withdrawal affects the stream flow in the Lower Chamokane?

A We have no delayed flows there. We may assume it's a direct pull, 900 gallons a minute out, you deplete the stream exactly 900 gallons.

Q Could you come over to Plaintiff's Exhibit 10 and point out where Mr. Smithpeter's diversion is, and where, in relationship to the Massive Springs area?

A Here's your Massive Springs area, here's your Smithpeter diversion, here's your Chamokane Falls, and just below the falls, as close as we could get it, was the South Stream Gaging Station.

Q So Mr. Smithpeter's is located, then, below your Massive Springs area?

A (Inaudible.)

Q But Mr. Smithpeter is below the Massive Springs area?

A Right.

Q So his effect, your said, is direct, I'm looking at No. 14, and taking Mr. Smithpeter's diversion, is that

SWP 15894?

A Yes.

Q And how much is he drawing there?

A Two and a-half second feet.

Q And that is done in immediate withdrawal?

A That is immediate withdrawal.

Q Okay. I believe Dawn Mining also has a surface diversion. Is that listed over here on Plaintiff's Exhibit 14?

A That's right across from the springs, right about in here, aimed at right here, it's Surface Water Certificate 7142.

Q Could you tell us what that is?

A 7142 is one second foot.

Q And is that effect also immediate?

A That effect would be immediate, they're both taken straight out of the stream flow that is flowing, right.

Q Now, how about the Fish Hatchery? I believe you said that comes out the same area, but it's nonconsumptive, correct?

A It's in the same area, and it's nonconsumptive.

THE COURT: Do you mind if I -- I don't quite understand the difference between, he testified the withdrawal of 2.5 second feet, and then later you talked about one second foot. What's the --

A That's the Dawn Mining withdrawal below the Massive Springs area.

MR. GERMERAAD: The 2.5, your Honor, is the Smithpeter --

THE COURT: Yes.

MR. GERMERAAD: -- and the 1.0 is the Dawn Mining.

Q (By Mr. Germeraad) Did you go through all the certificates and permits and for each one determine how much their permitted or certificated withdrawal would diminish the flow of Lower Chamokane?

A Yes. And here, again, would reflect this, that you pointed out about Mr. Seagle's well, I mean, this is assuming it has not been corrected.

Q Before we get to that, I believe that you said that since there is irrigation only a portion of the year, did you take Mr. Newhouse and compute exactly what part of the year, from his off-on meters, and everything, that he was pumping?

A Mr. Newhouse would be using .27, and we used that as a direct ratio throughout all of our computations.

Q So, in other words, the irrigation season that most people would be using is 20 --

A Counting haying and everything, yes.

Q -- 27 percent of the time of the year, they would be using water for irrigation?

A Right.
Q First, I'll ask you, just as an overall group, if you take all the certificated permits, either surface or ground water, how much, if they are used, is the flow in the Lower Chamokane diminished, by how many CFS?
A If they were used year round, it would be 20 second feet.
Q No, but I mean, making allowances for the irrigation?
A Making the allowance, the certificates would be 3.5 cubic feet per second.
Q Now, the permits, how many second feet would the permits diminish the flow of the Lower Chamokane?
A 3.44 Cubic feet per second.
Q So, in rough figures, the certificates and the permits, as used and issued, diminish the flow in the Lower Chamokane by seven CFS?
A Right.
Q So in doing this, you have taken, taken cognizance of the irrigation and considered that only 27 percent of the year that they're using that, right?
A Right.
Q And the domestic is the year around?
A Year round. You can carry that still further. The Fish Hatchery is nonconsumptive.
Q The surface water diversions, these are direct, but the

ground water diversions are in the time lag, and it's in the ground water diversions that you use the figure 2.7, is that correct?

A That's correct.

Q Okay.

A Only the surface waters that are above the ground water, where they flow into the --

Q Where they flow into Walker's Prairie?

A Yes.

Q Okay.

MR. GERMERAAD: Your Honor, I'd like to use Mr. Woodward's computations as to how much each one of these defendants affected the ground water, and introduce these computations, rather than going through each individual defendant, one at a time. Each defendant is listed by name, number, and how he affected the ground water, and the one mistake that was found on Seagle will be changed, and so we would like to be able to make a change, then, tomorrow, in this overall computation, if we could?

(Exhibit 32 marked for identification.)

MR. GERMERAAD: I would move the introduction, then, of Plaintiff's Exhibit 32, which indicates the certificates and permits and how much each affects the

ground water.

THE COURT: I understand one item in that will be changed, though?

MR. GERMERAAD: On the Seagle's, yes, your Honor.

(Various counsel going over exhibit.)

THE COURT: Plaintiff's Exhibit 32 has been offered, subject to correction as to the Seagle flow. Are there any objections to the admission of the exhibit?

(No response.)

THE COURT: It will be admitted.

Q (By Mr. Germeraad) I'm now going to hand you what is marked as Plaintiff's Exhibit 33, and can you tell us what Plaintiff's Exhibit 33 is?

A The State have also made available to us applications on file with their Ground and Surface Water Permits.

Q And did you figure out how they would have affected the flow if they were ever issued?

A By the same ratio or methods we carried it through and found that there would be a total effective flow or reduction in flow of 9.40 cubic feet per second. This total of all of them would be 16.37 cubic feet per second.

Q I notice that the figures that are in red, this is the amount of decrease in CFS, correct?

A Right.
Q But the column is identified as acre feet per year?
A Right.
Q Would you take and change the designation of those columns, please?
A I will call these, for lack of another name, it would be Effective Reduction in Chamokane.

MR. GERMERAAD: With counsel's permission, we would correct that same misdescription on Plaintiff's Exhibit 32, for lack of another column.

(No response.)

MR. GERMERAAD: No objection heard.

THE COURT: Do I understand your figure of 16.37 second feet is the total of Exhibits 32 and 33?

A That would be the total, yes, of 32 and 33.
Q (By Mr. Germeraad) When we have talked about a, of the effect of reduction in flow, where is the flow; where is the flow being reduced, where are we talking about?
A At the gaging station.
Q This is in the Lower Chamokane?
A Or in the springs, or the gaging station, either way.
Q If we're to take the flow of the Lower Chamokane, last year, did that mean that in, say, 1973, if, when the permits and the certificates, water use was being pumped, that the flow of the Lower Chamokane was then

seven CFS lower than it would have been without those permits and certificates?

A Part of those permits and certificates were in operation.

Q That's what I mean. Let's just take last summer?

A Yes.

Q Okay. We have a certain base flow in the Lower Chamokane; what was that base flow, what was the range of flow during the summer in the Lower Chamokane last year?

A I recorded a minimum of 17 second feet.

Q And how much higher was it at other times?

A Probably the base flow would be in the area of 20 second feet.

Q Sould the flow during the summer have been as high at certain times as 24 CFS?

A It would be my opinion it would be increased.

Q No, no, that is not my question. My question was, last summer, in fact, at certain times, was the flow in the Lower Chamokane 24 CFS?

A Yes.

Q Assuming that the permits and certificates were being used last summer and we had a flow of 17 to 24 CFS during the summer; had those certificates and permits not been used, what would have been the range of flow in the Lower Chamokane last summer?

A If we would have neglected that, also, the time of the, the time lag, they would have, yes.

Q So what would the flow have been last summer?

A Probably 24.

Q Twenty-four to what?

A Twenty-four to 27, somewhere in there.

Q If we added the seven CFS to the day that we had 24 CFS, then we could have had as high as 31 CFS flowing last summer?

A Yes.

Q Now let's turn to the uses that the Spokane Tribe can make of the water of the Chamokane Creek. Have you conducted a study of the irrigable lands located on the Spokane Indian Reservation?

A Yes.

Q And now I'm going to have you identify certain documents.

Now, I have placed up on the board Plaintiff's Exhibit 12. Would you tell us what Plaintiff's Exhibit 12 is, please?

A It's the Spokane Indian Reservation land capability as prepared by the Bureau of Indian Affairs, Branch Land Operations.

Q I'm going to hand you Plaintiff's Exhibit 11, and could you tell us what this is, please?

A This is the accompanying document and correlation and

classification of the soils.

Q Plaintiff's Exhibit 12 is a land classification map?

A Right.

Q I believe you have already been asked this question, but in the course of your work as a consulting engineer, have you at many times used soil classification maps provided by the Soil Conservation Service, U.S.D.A., Western Regional Technical Service Center, relating to the map and how the soil classification can be irrigable, and the irrigable nature of different soil classifications?

A I worked for the Soil Conservation Service as engineer, I worked for soil scientists two years in Montana, I was then transferred out here to the Interior Department with the Soil and Moisture Conservation Operation, and also worked with the soil scientists and using their work in connection for adapting it to its use to its irrigability of lands.

Q On this map we have designated Classes 2, 3, 4, 5, 6 and 7. Of those classes of land, which classes are irrigable, or generally considered irrigable?

A Under these conditions, Classes 2, 3 and 4 would be considered irrigable. There are certain conditions that can't be

Q Now I want you to look at Plaintiff's Exhibit 13 and

please describe to the Court what this is?

A We have taken this map, this base map over here, made by the soil scientists, and we have shown on it, "Land Capability (Below Elevation 2500)".

Q What classes of lands?

A And shown only those of 2, 3 and 4.

Q Okay. Would you show us --

A In addition, we have the similar classification on the non-Indian land on the other side, just for comparative purposes.

Q In other words, we have on this map the Chamokane Creek. Would you please point that out, and perhaps you can do it in blue; can you darken that with blue in any way? Could you do it on this one, please?

A (Draws on map.)

Q So you have now marked with a blue felt pen the path of the Chamokane Creek, and then on both sides of the Chamokane Creek, on the reservation side,and on the eastern side, you have indicated the soil classes of 2, 3 and 4?

A Right.

Q Now, I would like next to show you -- Would you please identify for us what Plaintiff's 3-1-74-4 is?

A That shows the land ownership and status map of the Spokane Indian reservation as of 12-29-72.

Q Now, in this first sheet of this exhibit are different portions of the reservation designated with different letters?

A Segment A, B, C. Segment C would cover the area we're talking about.

Q And are the four following sheets, then, shows the land ownership in each of the respective segments, correct?

A Correct.

Q Will you just, this first sheet, Segment C, now, Segment C borders part of the Chamokane Creek?

A That is correct.

Q And is there a legend at the right-hand side that indicates the type of land ownership, please, with respect to segments?

A Trusts, individually-owned; trusts, tribally-owned; trusts, tribally-owned-in-reserve-status; fee lands; fee lands, tribally-owned; government-owned, BIA, submarginal land; government-owned, BIA; government-owned, other federal agency; public domain.

Q There are several different classifications of designations. Now, over this past weekend, did I have you take a copy of Plaintiff's Exhibit 13 and indicate by color the tribally-owned, or Indian-owned land of 2, 3 and 4?

A Yes.

Q Do you have that exhibit? Is this that exhibit that you worked up?

A That's correct.

MR. GERMERAAD: I would like this marked as Plaintiff's Exhibit 34.

(Plaintiff's Exhibit No. 34 marked for identification.)

Q (By Mr. Germeraad) Would you take this Plaintiff's Exhibit No. 34 and take it over and show us how this is a copy of Plaintiff's Exhibit 13?

A It orients up, it's up to that point. It's, in fact, a part of it, cut off.

Q Of a similar or identical copy?

A Similar, or the same thing.

Q On this Plaintiff's Exhibit 34, there is a certain area that is darkened, looks like black pencil; what are these areas of land?

A The darkened areas are the Indian-owned lands.

Q And the yellow lands, what is this?

A The white-owned land.

Q The yellow is the white-owned, or non-Indian?

A Non-Indian.

Q Then what is this red up on top?

A That's a Class 2 irrigable land; Class 2, and probably

the best in Stevens County.

Q What, the best land in Stevens County?

A Irrigable, yes.

Q How many acres -- Can you see it?

THE COURT: I can see it. You started out talking about ownership, then you switched to types of land.

Q (By Mr. Germeraad) On 34 the only thing that is colored in, in any way, is Class 2, 3 or 4 land, is that correct, Mr. Woodward?

THE COURT: Yes, but he testified the dark was Indian-owned, the yellow was non-Indian-owned; what is the red, as far as ownership?

A Indian-owned, tribal-owned.

Q (By Mr. Germeraad) Now, the black and the yellow marking on here, is that, that's below a certain elevation?

A This is below the elevation of 2100, or a very logical irrigable or similar condition as are being irrigated presently along the Chamokane.

Q So that the defendants on the east side of the Chamokane are irrigating similar lands to those you designated in black and yellow?

A Very similar.

Q How many acres are blackened there; how many Indian-owned acres are there below the 2100 elevation?

A 1880 Acres of Indian land, lowlands.
Q Now, if these 1880 acres of Indian land were irrigated, how many acre feet would you give to each acre per year?
A (Figuring.) Round off, in this area, three feet.
Q Do some of the permits and certificates by the State vary from three to four?
A Right, that figure is three-something, rounded off.
Q Now, the red-shaded area on Plaintiff's Exhibit 34 that you said is tribally-owned land, what classification is that land?
A Class 2 land. It's better land.
Q How many acres are there in that block?
A 6580 Acres.
Q And if you were to irrigate that 6580 acres, how many acre feet would you put to each acre?
A At that time, three.
Q Three, okay. Could you make, how many, then, acre feet, would be used on that upper bench of land marked in red?
A It would be about -- (figuring) -- it would be about 19,000, it would be a little better than 19,000 acre feet.
Q And we have, then, a little over five; it would be 600?
A 600, Yes.

Q In the lower area?
A Yes. I'd like to use a rule-of-thumb, if I may, so I can have a second foot to irrigate 80 acres.
Q Would you please take the stand again, please?
If we are going to have, use 6580 acre feet of land on the lower Indian lands, these below 2100, and 19,740 acre feet on the upper, 6580 acres, I add those two figures and get something like 25,380 acre feet of water. If that mount of acre feet of water were converted to a CFS, a flow in CFS, how many cubic feet per second would that be?
A I had it all computed out, I'm going to have to find it. Somebody else computes it out there for me, Ira Lou.
Q Could that be approximately about 34.7 CFS?
A It would be about that, I didn't have the exact figures.
Q Now, these two areas, the black and the red areas, on Plaintiff's Exhibit 34, these were Indian-owned lands of Class 2, 3 and 4, and we have some Class 3 and 4 lands that are being irrigated to the east of --
A Right.
Q -- the reservation by some of the defendants, is that correct?
A Yes.
Q Could the flow of the Chamokane, could the waters of

the Chamokane Creek be diverted, then, to be used for irrigation on the Indian-owned lands?

A It could be entirely tied up with the use on Indian lands.

Q So you're saying, if you would use three acre feet per acre as a conservative figure, you would come out with 35 CFS; how would 35 CFS compare to the total flow of the Chamokane?

A It's gone, it would take it up.

Q Now, could the Tribe make other use of the waters of the Chamokane Creek, other than irrigation?

A It has been my recommendation, and it's surely been the recommendation of the fish and wildlife experts,we have Mr. Navarre. We try to maintain a 30 in the Lower Chamokane for fish life.

Q So the Tribe could use, then, the Lower Chamokane for recreation and use as a trout fishery?

A That is correct.

MR. GERMERAAD: And, your Honor, Mr. Navarre will be a later witness, and he will inform the Court that it is his professional opinion that 30 CFS would be necessary to support a good trout fishery in the Lower Chamokane.

Your Honor, if we could, this would be a --

THE COURT: You're getting into a new subject, now?

MR. GERMERAAD: Well, it would be a time when I'd like to be able to go over all this and find out if there is anything else that we would have to put in on Direct.

THE COURT: Well, it's a good time to take the evening break.

The Court will be in recess until 9:30 a.m.

THE BAILIFF: All rise.

MR. DUFFORD: Your Honor, has this Exhibit 34 ever been offered, or admitted into evidence?

MR. GERMERAAD: Oh, I'm sorry, I didn't offer it.

THE COURT: It was not.

MR. GERMERAAD: I would like to offer it.

MR. DUFFORD: I'd like to deal with that later.

THE COURT: All right, hold that off. And 33 was never admitted, either. Are there objections to 33? That's a list of State applications and no action has been taken.

MR. DUFFORD: There is no objection from the State.

THE COURT: That was 33. Thirty-one and 32 haven't been either, have they?

THE CLERK OF THE COURT: Yes.

MR. GERMERAAD: Thirty-two was the certificates and permits which was already admitted. Thirty-three

was that dealing with the applications, and what their effect would be.

THE COURT: Thirty-three will be admitted. We will hold ruling on 34 until morning.

(Plaintiff's Exhibit No. 33 was admitted in evidence.)

THE BAILIFF: All rise. This Court stands adjourned.

Hon. Marshall A. Neill, Judge
Spokane, Washington
Tuesday,
March 12, 1974
9:30 A.M.

THE COURT: Good morning.

MR. GERMERAAD: Good morning, your Honor.

Yesterday, your Honor, we informed the Court that we would update Exhibit 32 with the revised figures for Mr. Robert J. Seagle that the State Department of Ecology furnished yesterday, so I'm going to, first of all, hand Mr. Walter Woodward the Exhibits 32 and 33, and in reference to Plaintiff's Exhibit 32, Ground Water Certificate 4891A, Robert J. Seagle, is there a correction that you would make to the ground, to the gallon-per-minute figure that is listed on Exhibit 32?

A That's correct. The 575 rather than the 1150 that is shown.

Q I'm now going to hand you a pen to correct the Exhibit 32 to read 575 gallons per minute.

A (Does so.)

Q Is the amount of CFS, then, also correct?

A That's also corrected from 2.56 down to 1.28.

Q Would you mark that change on Plaintiff's Exhibit 32?

A (Does so.)

Q And acre feet per year would be corrected from .69 to

what?

A From .69 to .35.

Q Do you want to scratch out the total .69?

A (Does so.)

Q Okay. The total, then, of the certificates on their effect would be corrected to what amount, then?

A To 3.18 CFS.

Q Would you scratch out the 3.53?

A (Does so.)

MR. GERMERAAD: Your Honor, I don't know whether now the defendants would accept 32, or whether I should re-offer that exhibit as corrected. If that would be the proper procedure, I would now offer 32 as corrected.

THE COURT: Any objection?

MR. CAMPBELL: I wonder if, your Honor, if, on these exhibits, rather than a group of us going up there and looking at them, if counsel could bring them to us?

THE COURT: I think that would be more orderly. Thank you.

MR. REKOFKE: If the Court please, with respect to Boise Cascade, Boise Cascade objects to the admission of Exhibit 32, at least the conclusions contained therein. I have no objection to the various computations, but the conclusions arrived at by the witness, of course, I don't think are admissible.

MR. GERMERAAD: Your Honor, my response to that would be that since Boise Cascade will have an opportunity to cross-examine the witness, I don't think this has a bearing as to the admissibility of it, the weight to be given to the testimony and that exhibit, that merely puts in written form the testimony of Mr. Woodward, and then be examined by the Court afterwards. In other words, it goes to the weight of the testimony and not to its relevancy or admissibility.

MR. REKOFKE: In response to that, there is a column here, I can't read it very well, maybe counsel can decifer it for me?

MR. GERMERAAD: That says -- I'm going to have the witness read it, your Honor.

MR. REKOFKE: The witness writes like I do.

A It's the effective reduction in the Chamokane.

Q (By Mr. Germeraad) Then --

MR. REKOFKE: So I would object to that column, your Honor, as conclusions of the witness set forth in that column, because it could be misleading. True, we have an opportunity to cross-examine the witness, but I feel that portion of the exhibit should not be admitted, and I object on that ground.

MR. GERMERAAD: Your Honor, I would say that Boise Cascade has waived its objection, since they didn't make

the same objection yesterday, they allowed the whole exhibit to come in, and there's been no changes made in anything that relates to Boise Cascade.

THE COURT: I'm going to admit the exhibit as corrected, but I want to ask the witness a couple of questions.

EXAMINATION

BY THE COURT:

Q You testified yesterday, before making this correction, that you perhaps had a total effect of the permits and certificates as issued, together with those pending in application form, to total 16.37 second feet; so isn't that figure affected by this change?

MR. GERMERAAD: Yes, your Honor, we're going to make a change, make a correction, to Plaintiff's Exhibit 33, and carry over that, and that would be an additional correction.

THE COURT: All right.

Direct Examination, Continuing:

BY MR. GERMERAAD:

Q Mr. Woodward, yesterday I believe your testimony was that ground water diversion in the Walker's Prairie area, and surface water diversion anyplace in the basin, affects the flow in the Lower Chamokane, is that correct?

A That's correct.

Q Are there certain places where ground water withdrawals can be made within the basin that you do not believe will affect the springs and therefore the flow in the Lower Chamokane?

A I believe it would be little or no effect of the ground water diversion in the Camas Valley area.

Q Going to Plaintiff's Exhibit 10, which is on the board, anything to the left-hand side of the red felt line, which denotes the Upper Chamokane from the Middle Chamokane, then ground water withdrawals from this area, you do not believe affect --

MR. REKOFKE: I'm going to object to counsel's leading the witness. He did it all day yesterday. I haven't objected, but I feel he should let the witness testify.

THE COURT: The objection is well taken.

Q (By Mr. Germeraad) I'll rephrase the question, Mr. Woodward. Would you come over to the board, please?

A (Does so.)

Q I believe you said there are certain areas where ground water withdrawals would not affect the flow. Would you show us on the map, please?

A I feel any ground water diversions above this point designated as the Upper Chamokane has no effect.

Q Do surface diversions in that area affect --
A They do.
Q You can take the stand.
A (Does so.)
Q In reference to Plaintiff's Exhibit 33, is there on that list one ground water application that falls in that category?
A (Witness hesitates.)
Q Would you please --
A Ground water application 11753, Harold Dixon, located at 29 40 7E, 100 gallons a minute.
Q And CFS is?
A Well, .22.
Q And effective reduction on the Chamokane?
A Has been shown as .07.
Q Then what do you wish to do to that exhibit?
A I believe that should be stricken.
Q Would you strike that entire line, then, please?
A (Does so.)
Q Now, does this at the bottom of the column called Effective Reduction in the Chamokane, there is a figure that totals the application; what is that?
A That is 9.40.
Q You're going to do what, now?
A Subtract .07 from that, and I end up with a 9.33.

Q So now the applications would affect the reduction in the Chamokane by what amount?
A By the .07.
Q No, that was the change. How much is, now, the exhibit, in your testimony, reading?
A Take the .07 off that; 16.30.
Q Now, from, we made a correction in Plaintiff's Exhibit 32, and which, if we reduce Mr. Seagle's effect, the effect on the reduction in the Chamokane, would that also be deducted, then, from the total of the certificates, permits and applications figured on Exhibit 33?
A That reduction would also be indicated on this total here.
Q Would you make that further reduction, please?
A It would be the difference between the 64 -- It would be 34, subtract another 34 from that. It would leave 15.96.
Q So, Plaintiff's Exhibit 33, as corrected, reads 15.96 as the effective reduction in the Chamokane in CFS, is that correct?
A That's correct.
Q Would you now scratch out your old 16.37?
A (Does so.)

MR. GERMERAAD: I would re-offer the corrected copy of Plaintiff's Exhibit 33, your Honor.

MR. REKOFKE: I would make the same objection.

MR. CERUTTI: Your Honor, for the record, I would make the same objection on behalf of Defendant Seagle, and this exhibit has been modified as to them this morning. I don't believe the conclusions are adequately supported by the evidence.

THE COURT: I'm going to admit Plaintiff's Exhibit 33 as merely a computation of the testimony as given by the witness. So, Plaintiff's Exhibit 33 is admitted.

Now, I'm not sure that I got these figures right. Mr. Woodward, the effect of the diversions by the permits and certificates as shown on Plaintiff's 32, in your opinion, the total effect in the stream flow is 9.33 second feet?

A That is correct.

THE COURT: What is the figure 15.96?

A That is the total --

THE COURT: Of the two exhibits?

A -- of the total exhibits, including the applications, permits and certificates.

Q (By Mr. Germeraad) Mr. Woodward, would you come over to the board again, please?

A (Does so.)

Q How does Plaintiff's Exhibit 34 relate to Plaintiff's Exhibit 13?

A It's taken from this, and we have added color to show, to distinguish the various classifications and ownerships.

Q The color is the ownerships, is that --

A The color yellow designates the non-Indian ownerships, and the black-and-red, the black indicates Indian lands and the red indicates tribal lands, Indian tribal lands with a few interspersed Indian allotments.

Q Now, the black, is that both Indian allotment and trust land, too?

A Yes.

Q Now, did I -- I'm going to put out another exhibit. I'm now going to refer to Plaintiff's Exhibit 3-1-74-4, and would you please, again, tell us what this exhibit is, please?

A That shows land ownership of the Spokane Reservation, and dividing it into segments.

Q Now, this was the status map as of what date?

A As of 12-29-72, updated.

Q Well, we know that already.

A All right.

Q I'm going to now turn to Segment C and ask whether the map, the fourth page, called Segment C, is this Segment C part of the Reservation also part of that shown on Plaintiff's Exhibit 34?

A Yes.
Q Is the portion called Segment D of Plaintiff's Exhibit 3-1-74-4 also shown in part on Plaintiff's Exhibit 34?
A Yes.
Q Mr. Woodward, did you, at my request this morning, recheck the ownership segments as shown on Plaintiff's Exhibit 34 --
A Yes.
Q -- to the ownership shown on Plaintiff's Exhibit 3-1-74-4?
A Yes.
Q I am now going to point to Segment C of Exhibit 3-1-74-4 and I want to direct your attention to Section 27 on that exhibit, and Section 27 as shown on Plaintiff's Exhibit 34?
A Yes.
Q On Plaintiff's Exhibit 34, there is some in that section that is colored black, is that correct?
A That is correct.
Q And on Plaintiff's Exhibit 3-1-74, would you find the corresponding land, please?
A Right here.
Q What is the legend, what type of land; there are two types of land found in Section 27; could you tell us what those two types of land are?

A We have trust land, tribally-owned, and we have fee lands.

Q Okay. Have these fee lands been shown on Exhibit 3-1-74-4, in Section 27, colored in black or yellow, on Plaintiff's Exhibit 34?

A The northern part is in yellow, and the lower part in black.

Q Could you tell us --

MR. CAMPBELL: If your Honor please, I would like to know the township and range, if Mr. Woodward can give it to us?

Q (By Mr. Germeraad) Could you read the township and range off of 3-1-74-4, please?

A (Witness hesitates.)

Q I would direct your attention --

A Yeah, 28-39.

Q So it's Township 28 North?

A And Range 39 East.

Q Thank you. Why is it that you have a colored black one here on 3-1-74-4 that shows in fee?

A That has been a transfer. The tribal bought that --

Q The tribe bought or reacquired former fee lands in Section 27, is that correct?

A That's correct.

Q Now, is there also a section in 28 that was also re-

acquired by the tribe?

A By the same reason, yes.

Q How many acres are involved in those two sections?

A There are 190 acres.

Q 190 Acres. Could you take your black felt pen and outline the already light grey or black colored area on Plaintiff's Exhibit 34?

A (Does so.)

Q Thank you. Now, the rest of the black area and the red area on Plaintiff's Exhibit 34 is made up, I believe you testified, of two types of land, either tribally-owned trust land, or individually-allotted lands, is that correct?

A That is correct.

Q Thank you. Mr. Woodward, yesterday I believe you gave us some testimony as to a time lag for certain ground water diversions. How much of a time lag is there between ground water diversions, let's say in the area of Newhouse, when do they start to effect the flow at the springs?

A Probably less than a year. During the same irrigation year. If -- Irrigation in the early season would probably affect it in the later part of the season.

MR. CERUTTI: Your Honor, I'm going to object, unless the witness can testify as to the reasonable

probability in his opinion. Also as to his test data in support of his opinion.

THE COURT: Well, of course, testing, the first part of your objection would be proper in cross-examination. On the second half, if there is, for instance, a foundation for his opinion, counsel, we're going into that.

MR. GERMERAAD: I believe that was supplied yesterday, your Honor, but if we need to go over it again today, I would be very happy to.

Q (By Mr. Germeraad) I'm going to hand you, as I did yesterday, Plaintiff's Exhibits 23-A, 23-B and 23-C, and starting with Plaintiff's Exhibit 23-A, would you please describe that exhibit and what that shows and how this bears on your conclusions regarding Mr. Newhouse's diversion?

A We kept the time off-on of the Newhouse pump, and was running a paralleling recording device in the Hill Well No. 112, and we would find a direct relationship of the rate of change of slope.

THE COURT: Does this have to do with this gradient you testified to yesterday?

A Yes.

THE COURT: Counsel, I think you went into that yesterday.

MR. CERUTTI: Yes, I'm familiar with the testimony, your Honor, but I'm not clear on this relationship between that test data and this question, as to the time lag. I'm not clear as to why the data is important to the answer to this question.

THE COURT: You may respond.

A As we go down the valley, we have a general slope of probably 15 feet to the mile. We have a close relationship, transversely, we have a lag longitudinally. The farther we are up from the valley, the longer the lag between its immediate effect or its effect on the flow of the springs. By the same token, if we were to go clear to the north line, or up in the upper valley, we might find as much as two years, in this area, probably a year, and if taken clear to the extreme, where we pump out immediately above the springs, the lag would be immediate, there would be no lag.

Q Maybe I could ask one more question: Is there a lag because it takes -- For water to pass through this upper strata, how fast does it rush through it; I mean, how fast does water go through this formation, this rock formation?

A I tried to give that in the answer, by mid-valley, I thought it was less than a year; by top of the valley, probably two years; and immediately by the spring itself,

almost immediate.

MR. GERMERAAD: Your Honor, I think that lays a sufficient foundation, and I would like to go back to my original question.

THE COURT: You may proceed.

Q (By Mr. Germeraad) The time lag from when a ground water diversion in the vicinity of Mr. Newhouse and his well is felt at the spring is how long?

MR. : Would you repeat --

A Less than a year.

Q (By Mr. Germeraad) And would you say that pumping at the first part of the irrigation season could be felt, perhaps, by the end of the irrigation season?

MR. REKOFKE: I object to counsel's leading again.

MR. GERMERAAD: I'm just rephrasing what he's already given here.

MR. REKOFKE: Then it's repetitious.

THE COURT: Sustain the objection. I think it's all a matter of record.

Q (By Mr. Germeraad) If there is a ground water diversion, or a surface water diversion, in the upper portion of Walker's Prairie, how long would the time lag be before it could be felt at the springs?

A Upper Walker's Prairie, or Camas Prairie?

Q Just Upper Walker's Prairie?
A Just the very Upper Walker's Prairie, as much as two years.
Q And in the Camas Valley, any water diversions would be felt how --
A About the same. Very little difference.
Q If the flow in the Lower Chamokane were to be affected by six and a-half to seven CFS in the summer of 1973, pumping during which years, or pumping during which irrigation season would that be the effect of?
A State it again, so I can get the time.
Q If the flow of the Lower Chamokane, in other words, the water coming out of the springs, were to be reduced by the six and a-half to seven CFS, from the certificates and permits, that pumping, in what irrigation season is that the effect of?
A It would be a variable of a function of all of them. Now, the lower end would be affecting the medium, and it would be a longer lag; as you went up the valley and as you get clear to the top of the valley, it would be probably two years.
Q Thank you.
A But the total, as it went through and over a two- or three-year period, it would have balanced out and would have lost all of it.

Q In your study of the water in the various parts of the Chamokane Creek Basin, how would you typify or describe the water quality in the Lower Chamokane?

A Comparing it to the old Spokane Basin, I believe it would probably be the more nearly pure water we have coming into the Spokane River.

Q Could you please tell the Court how much you have personally walked the entire basin, and what portions of the Chamokane Creek area you have personally walked in the past three or four, or as many years as you have been going up there?

A We have walked every foot of the lower basin to the springs and at times probably been to almost every point of the Walker's Basin, in the Walker's Prairie, and as we go up, I have traveled up through the Camas Valley, that portion of the basin, every time there was a flood, many times.

Q From your walks in the Lower Chamokane Creek area, can you tell us whether there is any augmentation of the stream flow below your Massive Springs area?

A No, we saw no major infiltration either by springs or streams.

Q Did you see any minor infiltration?

A Not even seeps.

Q Is this lack of augmentation consistent with the

geological study which you did of the basin?

A Yes.

MR. GERMERAAD: Late yesterday, we talked about the irrigable lands, which was Plaintiff's Exhibit 34, your Honor, and at that time we did not offer it. I would now offer Plaintiff's Exhibit 34 in evidence, and then I'll ask further questions about it.

MR. TORVE: Your Honor, we would object to this particular exhibit at this time. Perhaps maybe a question on Voir Dire?

THE COURT: You may.

VOIR DIRE EXAMINATION

BY MR. TORVE:

Q Mr. Woodward, did you make any attempts on this particular exhibit to determine what portion of the tribal lands were reacquired pursuant to the various acts in the 1960's, back to the tribal status from the surplus lands; did you make any attempt to do that?

A (No response.)

MR. TORVE: Your Honor, I guess I would object, or agree to the admission only for the purpose of showing what the tribal land at this time would be, and concede to what the extent of irrigation would be, but I would point out that one of the issues of the lawsuit,

of course, is priority dates, and one of these points is that in 1958 or 1955, whichever you can rely on, a portion of lands were deeded back or given back by the federal government to the Spokane Indians from surplus lands open to homestead, and of course, the statement of the natural resource is that they are the priority group, those particular lands are deeded back, and not a reservation status priority, the priority being re-conveyed back to the tribe, so that as far as this exhibit is concerned, insofar as it reflects the situation today, we have no objection, but if it purports to indicate what the extent of tribal ownership and reservation rights are attributed to that, or atta ched to that ownership, pursuant to some Winter, U. S. versus Winters document, we would not object to the exhibit. We think the issues are in the lawsuit, what are the priority dates may be distinguished by the various transfers of the land itself and not a total concept as shown on this exhibit.

MR. GERMERAAD: Your Honor, I would like to respond to that. I know of no defendant involved in this case that has land in the category that Torve has got, as it is well known, that courts do not render opinions where issues are not in evidence. I think Mr. Torve is bringing up just an abstract legal question

that is nowhere involved in the case, but even if it were involved in the case, the position of the United States is that since this land was never homesteaded, we only have the lands that is tribally-owned, and tribal allotments, which we have testified to today. It was one 190-acre segment which we said at one time was in fee, which the tribe has reacquired, and I don't think that, that these issues are involved, but because there are no defendants in the case, and I think, that fall into the category, as to, there is no one who is advocating a priority date under the legal theory that Mr. Torve has brought up. So, as to the first line, I would suggest that he has no objection, and his department can't represent that his department is anyway involved, or any other defendant is involved, and I would submit that his objection be denied.

THE COURT: Well, isn't 34 merely an exhibit which shows the classification by ownership within the reservation as of this time?

MR. GERMERAAD: Your Honor, 3-1-74-4 shows the tribal ownership as to this time, and that ownership status has been superimposed on Plaintiff's Exhibit 34, which shows the Class 2, 3 and 4 irrigable land, so that we have colored in red and black the tribally-owned lands, and the individual allotments.

THE COURT: There's nothing in the exhibit which relates to time, which may or may not become an issue in this case.

MR. GERMERAAD: If it does, I would suggest it would be handled more properly in the briefs, and the position of the United States certainly is that the State's position is incorrect and it will be maintaining that position, if and when that issue does rise in this case, but I know of no instance or parties through which that issue can rise.

THE COURT: Mr. Torve, I do not get the connection between the exhibit, and its purpose here, and your objection; it doesn't purport to show the date of ownership; it just shows the existing situation, as I understand it.

MR. TORVE: To the extent that the exhibit purports to show a relationship to the Winters Doctrine, i.e., reservation of rights related to the practical irrigable lands for the amount of water that might be reserved on the creation of the reservation at that time; if it purports to do that; if it doesn't, I guess I would withdraw my objection, but if it purports to do that, then it would be attempting to say that all the lands colored in red on the exhibit have attached to it some reservation water rights, Winters, and my position,

and I think this is generally misconstrued by our Prosecutors, that we argue over what the scope of their rights,are, i.e., what is the priority date of their right, because my client has land in, that might be affected, and we would be arguing that the priority date of any rights they have are going to be affected after, when they acquired their lands, not just 1877, or 1881, or acquiring back-purchasing of former homestead land, but also the date as to when they re-acquired surface lands that had been opened for homestead, so it's material to the action to determine the relative priorities between my client and other defendants in this action as to when they acquired their rights.

MR. GERMERAAD: I think Mr. Torve just refuses to look at the BIA document 3-1-74-4 that we have introduced; the ownership is set out very clearly. He did not object in any way to that exhibit, and if he's not pointed out that anything in that exhibit is wrong, and it has been on file for a number of weeks, and until he does, until he shows that that is in error or that it doesn't take effect of the history of the allotments, then I think he has no objection.

MR. TORVE: At that point, your Honor, the exhibit, as I understood it when it came in, merely showed what the status of things were today, and didn't purport to

make the distinction that may be necessary to their case, and on that basis I have no grounds for objection to the ownership map as it came in, because it reflected what today's status is, but it's, which is also material to priority dates and the rights of the tribe, but it doesn't show the issue of what the relative priorities are.

THE COURT: Well, I see no connection between the issue of priority dates and the exhibit. It appears to the Court that Exhibit 34 is merely a map that holds together the existing situation on the reservation as to the types of ownership. Now, we get, or we may get into the question of when certain rights accrued, which is a priority question, but I don't believe this exhibit is related to that, and on that basis, I'll overrule the objection.

Are there other objections to 34?

MR. DUFFORD: Your Honor, I would like to question on Voir Dire at this time; I'm not really sure what this exhibit does purport to show, and I'd like to have that clarified.

VOIR DIRE EXAMINATION

BY MR. DUFFORD:

Q Mr. Woodward, is there a key, or a legend, or anything

that tells us what that exhibit shows, on the exhibit itself? I see some colors and lines.

MR. GERMERAAD: I believe, your Honor, there was testimony on this, as to what those colors are.

MR. DUFFORD: I'm sorry, I fail to understand why some of the area that is in red, and some in black, with respect to Indian ownership.

THE COURT: Counsel, he's already testified to that. You can refresh your memory.

Q (By Mr. Dufford) Is there an elevation component to this?

A No.

Q None?

A Not to this figure.

Q What does the white area represent? I recall no testimony on that.

A The white, what has been outlined here, is what I considered, from the soil maps, as irrigable lands, possible irrigable lands; the white is non-irrigable lands.

Q Would you speak up louder, please, for the Court Reporter?

A The hatched and surrounded areas are the irrigable lands, of different classifications. The white indicates that we have not considered them as irrigable lands, and that was pointed out on the board.

MR. DUFFORD: Thank you. That's all I had.

THE COURT: Plaintiff's Exhibit 34 will be admitted.

Direct Examination, Continuing:

BY MR. GERMERAAD:

Q The lands that we have designated in black and red on Plaintiff's Exhibit 34, is it feasible to irrigate these lands from the Chamokane Creek?

A Yes.

Q Now, I'm not sure that the record is entirely clear; I believe when you first testified yesterday as to Plaintiff's Exhibit 34, you said that the black, generally, the black area was that area below 2100 feet, or 2200 feet, is that --

A This also answers the other question. We tried to distinguish between those lands which could be irrigated in a very comparable, with the same feasibility as are the lands presently being irrigated under non-Indian ownership. The reason that we did distinguish the upper lands is because it would take higher pumpage to this area. It wasn't quite as feasible.

Q I'm going to hand you Plaintiff's Exhibit 3. By reference to Plaintiff's Exhibit 3, can you determine the elevations of these different lands?

A Yes.

Q And this would indicate that the land you have colored in black is below the 21, or below the --

A It's 2000 to 2100.

Q Okay.

MR. GERMERAAD: Mr. Dufford, I think that answers your question, doesn't it, that you asked?

MR. DUFFORD: Yes.

A -- while we made one pink and one black.

Q (By Mr. Germeraad) Did the Tribe at one time give consideration to the possibility of irrigating from the Chamokane, especially the lower lands?

A We were asked by the Tribe to study Reservation-wide all irrigable lands and stage them into various levels and feasibility of irrigation, which will, of course, what may be irrigable today, I mean, not irrigable today, may well be irrigable 10 or maybe 100 years from now. In this, we did study what lands could be irrigated, at, at that time,I believe we took a 2200 elevation and up to the 2500 elevation, and in our recommendation to them, we had pointed out, or we had recommended to the Tribe that the consideration be pumpage from the Spokane rather than to spoil a stream which we felt would be irreplaceable, and at that time, we did show an irrigation project coming clear from the mouth of the Spokane clear up to the, irrigating all of

the lower lands, as well as those on the upper bench of the Chamokane.

Q So you could irrigate those lands from either the Spokane or the Chamokane?

A Yes.

Q There were a few exhibits yesterday that we didn't get to describe, and can help, perhaps, elaborate on the study which you have done of the basin. I'm going to hand you Plaintiff's Exhibit 18; would you describe for the Court what that exhibit is, and what it portrays?

A In the Hill Well, which is Well 112, Gate 2840-8H-1, we put, maybe -- Perhaps it would be better --

Q Excuse me, Mr. Woodward, if we put this up on the board, perhaps everybody could see it a little bit easier, and before I ask any more questions afterwards, the people can examine it.

A The Hill Well we had previously selected as, in our opinion, and this was also former employees of the State's opinion, which might be a more --

MR. TORVE(?): I'm going to object, your Honor, volunteering the opinion of --

THE COURT: The objection is sustained. You were asked the question, Mr. Woodward, what is the exhibit, what does it purport to be?

A It's a monstrous representation of the ground level in the Hill Well No. 112.

MR. TORVE: Ground level or water level?

A Ground, water level.

Q (By Mr. Germeraad) What is the green line?

A The green line represents the levels of the water table in the year 1971.

Q How about the red line?

A The red line, then, is continuing on to '72, and the brown line on to '73, and to two points, as directed by the Court, together, for '74.

Q Now, using that exhibit, excuse me, this Hill Well is near --

A Directly across from the, transversely across the valley from the Newhouse Well.

Q How far away is the Newhouse Well, about?

A About a quarter of a mile.

Q Now, in referring to Plaintiff's Exhibit 18, can you tell us a little bit about the behavior, then, or the recharge of the ground water in '71, '72, '73 and '74?

A We found the ground water diminishing approximately two feet from '71 to '72, and approximately three feet from '72 to '73, and it immediately recharged, as we '74, to the point of nearly back to our '71 level.

Q Referring to the same Plaintiff's Exhibit 18, could you indicate and read to us the highest points of the ground water in 1971, and then the lowest point of the ground water in '71?

A Elevation 1795 would be the highest point, which would be the 1st of May, and the lowest would be elevation 19 -- uh, a little above 1790-1/2.

Q Now, could you tell us, in 1972, what was the highest ground water level in the Hill Well?

A That's 1793.

Q Okay, and what was --

MR. CAMPBELL: If your Honor please, may I ask a question, what does 1772, and the other figures written in red, mean? Is that above sea level, or --

A We referred all of our wells, all of the elevations, to the U. S.coast geodetic survey, to indicate --

MR. CAMPBELL: Can I ask another question, is that elevation above sea level you're reading?

A Yes, sir.

Q (By Mr. Germeraad) The highest, you said, in '72, was 1793; what is the lowest water level during 1972?

A That's 1788.5.

Q What was the highest water level in 1973?

A Just a little above 1791. And the lowest water level, 1786.

Q Did the recharge in '72, excuse me, before I got into that, if we were to take a difference of a low point and the high point in 1971, what was the decline, the total number of feet of decline of the water level in 1971?

A Nearly five feet.

Q And you could correspondingly, then, determine the amount of drop in 1972 and '73?

A Yes.

Q The highest water level drop in 1973 was how many feet lower than the highest water level in 1971?

A About five feet.

Q Okay, I think you can --

A Four feet; the highest was about four feet.

Q Thank you. You can retake the stand, please.

A (Does so.)

Q If you were to characterize the four years of your study of the Chamokane Creek Basin, how would you characterize that four-year period?

MR. REKOFKE: Object to the form of that question; I don't know what he's talking about, characterize the study.

MR. GERMERAAD: I asked him to characterize the four years of his study, the water years.

THE COURT: Well, we will let him answer. I don't

know what he's going to come up with, either.

A I'm not being guided by my attorney, but if I were given four years of my knowledge of essentially what might have happened in the Chamokane Creek, I don't believe we would have been blessed with a more variable from the highest, from the dryest, from the highest flow to the lowest flow. I think we have had a wider range of study. I think that in '71, as I compare that to a 40-year period, it's more nearly representative of that period. I don't think I could have found four better years if I had the choice of selecting, than I did.

Q (By Mr. Germeraad) You said that 1971 was the representative year of the past 30 or 40?

A Yes.

Q You said there was a dryest year; what year are you talking about?

A Last summer.

Q And you're talking about a very wet time; what year are you talking about?

A That was the wettest fall we ever hope to see, and winter. The, more, further than that, it caught us with a basin with a more acceptable time of recharge, more susceptible to recharge this year than any year I ever hope to see.

Q Did you get a large amount of recharge from this winter's thaws?
A Very much, two of them.
Q And that is indicated on Plaintiff's Exhibit 18 by two points?
A Two points, yes.
Q I believe you testified that the lowest point in 1973 was 1786.3, or .25, or thereabouts, and could you come over here again and please tell us what the point is for February 1st, 1974, please?
A That goes back up to 1794.6.
Q So is that a recharge, am I correct, of over eight feet, from the low point in 1973?
A Yes.
Q The flooding conditions that were experienced in the Chamokane Creek this winter during the thaws, how does that flooding period compare to past years?
A It was a sustained flood, it was long periods, it was two floods; we had one in the middle of December, and we had one in the middle of January, both of which were over, ended up by being over unfrozen ground and in a surface which was readily acceptable to water.
Q Every how many years would you expect a flood like that to recur?
A If you compute it, it would be in excess of a 100-year

flood for that basin.

Q So if that was a 100-year flood giving us eight feet of recharge, would you expect, then, to get another eight feet of recharge from whenever the low point is in 1974?

A You're shaking your head, but I don't know that. It comes, that is, the computed long-range flood that I'd have repeat in two years.

Q Is it your best professional judgment it would repeat in two years?

MR. : Objection.

A I wouldn't infer that it would repeat, no.

THE COURT: Objection sustained. He gave his answer.

MR. GERMERAAD: Your Honor, this might be a good point in time to take a short break.

THE COURT: All right, the Court will take about a 10-minute recess.

(A 10-minute recess was taken at this time.)

Direct Examination, Continuing:

BY MR. GERMERAAD:

Q Referring to Plaintiff's Exhibit 18, the recharge we have indicated for 1974, how does that relate to the 1971 level?

A I believe it brought us back up very comparable to our 1971 level this year.

Q Now, on Plaintiff's Exhibit 18, that is the Hill Well, correct?

A Yes.

Q Is the Hill Well also indicated on Plaintiff's Exhibit 23-A, B and C?

A The three separate years, A, B and C, yes.

Q And the other parts of Exhibit 23-A, B and C, what are the bars along the bottom of the exhibit?

A They represent the amount, the time of pumping, and the relative amount of pumping heads as used by Mr. Newhouse.

Q The top squiggly line is what?

A That shows the flow of the Chamokane Creek at the discharge gaging station.

Q This is the gaging station?

A Lower gaging station.

Q Now, throughout the many exhibits, I think most of those numbered between 15 and 23, are what are termed hydrographs. I'm going to hand you some rolled-up documents, and could you just tell us how these relate to the hydrographs that you have drawn of the Hill Well?

A We have in all the wells, the Hill Well, and the other three wells, a float which shows elevation as against

time, and these have been put on by the week, changed by the week, and it shows the -- The reason they're not put into evidence is because they're quite voluminous, but it does show, with relation from time, as it goes across, the depth of the well from the surface. From those --

Q First of all, what type of recorder is that made off of?

A This is a Stevens Recorder.

Q Now explain the other documents you have in front of you?

A From these, in order to make those continuous and more legible to us, in our mind, to see what is really happening to the watershed, we have cut those so that we can go from year-to-year, and it shows the total in exact scale. These are to correct scale, and it shows how we have started out here with a recharge basin in June -- Let's go this other way, here, and we have, have been compared for three and four years, you spread them out all over the floor, you can see the ups-and-downs as it carries through the years. We have summarized that, for the purpose of this Court, on the one sheet. This might bring out a little better, it does show on these --

Q You're referring to "these"; you're now referring to

Plaintiff's Exhibit 23-A and the Hill Well No. 112?

A They show, but not on an exaggerated scale, the rate of change of flow of the gradient during the pumping period, as it does on these. These here are, have been condensed.

Q Thank you.

A This same thing -- Shall I go further? We have done the same thing on the discharge at the Lower Chamokane, in which we have, the geological survey has their gauge established there. We felt that during the low-flow summer months we needed a more exaggerated scale, or a more true scale, so it would be more representative of it.

Q I'm going to hand you Plaintiff's Exhibit 17-A through D; would you please tell the Court what that is, please?

A These are the daily records flow as produced by the U.S.G.S.

Q Then I'm going to hand you Plaintiff's Exhibit 21; would you please tell us what that exhibit is?

A For our purposes, we felt that we needed a, rather than a daily flow, we needed an hourly flow, and we needed a more exaggerated and more true picture of the flow, so we did put our gauge piggyback over the top of the U.S. Geological Survey's, so we had an accurate flow, direct, raise a tenth and show a tenth.

Q So if we were to relate, Plaintiff's Exhibit 17-A through D shows the hydrograph at the gaging station as a daily flow, and Plaintiff's Exhibit 21 shows the hourly flow?

A That would be correct.

THE COURT: Is that the same station?

A At the same station, yes.

Q (By Mr. Germeraad) Why is there variation in the hourly reading of the flow on Chamokane Creek?

A At first we were going to accept the Geological Survey's record, and we noted at 11:00, or 11:30 every day, we noticed this squiggly, a little squiggle, a little jump in it.

Q You're talking about a temporary increase?

A A temporary, just a little, short increase. It got to worrying us, so we did find out that was due to a gate change up at the hatchery, and was enough to reflect the little wave as it went down through there.

Q What did you mean by "gate change at the hatchery"?

A As they were changing from pond to pond.

Q What is the effect of that?

A That gives these a little high and a little low; it left an irregularity which we couldn't understand, or didn't like to see in our picture.

Q Are you saying the fish hatchery, then, released a

certain quantity of water at that time?

A It tended to release and then hold back until it made up that release. We didn't understand it until we went out, we did check with the fish hatchery people, and we found out that operation was 8:30 every morning, where they pulled their gates, and we caught it at the gaging station. We put that on, and at the Lower Chamokane we found as much as, when we put ours on, which was, instead of 6:1, was 1:1.

Q You're talking ratio?

A Ratio. We wanted ours true, because that much means a second foot. We wanted ours true, so we put that on there. Then we found a variation of as much as three- to four-hundredths variation.

Q This is three- or four-hundredths on the staff gauge you're talking about?

A On my gauge, yes. And so we then directly related it to the temperature change, and were only able to charge it off on evapotranspiration losses.

Q If we were to change the three- or four-hundredths on the staff gauge to a CFS flow, how much change is that over the course of a day in the flow of the Lower Chamokane?

A In the area that we're talking, in roughly the 20 second feet area where we were disturbed about,

concerned about. Each hundredth means about a second foot, cubic foot per second, so it was important to me to record during the day that difference. Now, the State's records, and the Geological Survey's, show the average.

Q That's the U.S. Geological Survey?

A That's the U.S. Geological Survey. For the purpose of our fish, for the purpose of what we were trying to know, it was the minimals which concerned us, the minimum flows, and where they would show maybe an average of 20 hours, we would show an actual minimum of clear down to 17, and that was due primarily a little bit to this irregularity in operation of the fish hatchery, and primarily due to evapotranspiration, evapotranspiration losses, which we were able to directly relate to the temperature variations at the Spokane Weather Bureau.

Q Could you describe for the Court, or define for the Court, what you mean by "evapotranspiration", and what, what that principle involves?

A Rather than the term of evaporation losses, which would be like an open stream, it's that which is taken off by transpiration losses from the growth along the creek, and the losses due to it, and it was directly proportional to our temperatures and winds.

Q Then evapotranspiration allows for both the evaporation of the water and that amount taken out by the surrounding vegetation?
A That's correct.
Q I'm now going to hand you Plaintiff's Exhibit 22, and would you please describe for the Court what Plaintiff's Exhibit 22 is?
A The closest place where we could get an hourly change of temperature was at the Spokane Weather Bureau, and we were able, then, to superimpose by these same charts, hour-by-hour, over our flow in the Chamokane, and we do find the same ratio of your evapotranspiration losses with the air-temperature aspect.
Q Thank you. Is there some hydrologic principle that makes the springs flow at whatever rate they are flowing, and, in other words, could you please describe why the springs at the Massive Springs area flow at the rate they flow?
A The springs are really the spillway of the whole basin. They're at the point of the, or the line of the, looser layer to the finer layers underneath, and as we back up, it's heavier, the thicker depths of water above it, makes the water flow heavier over the spillway.
Q Are you talking something about a hydrological head?
A Hydraulic gradients.

Q Is there any relationship between a decline in the hydrologic head and decline in the spring flow, and would you please explain that principle, please?

A Are we talking immediate, sir, or are we talking clear up the valley; are we talking about the whole gradient of the valley, or are we talking immediate?

Q Could you start at the immediate and work your way up the valley to talk about the difference in the hydrologic head?

A The springs are the result of overflow of the spillway, and the deeper the water is that is coming over the spillway, the more water that is going to flow, and where it's related to the long, steepness of the gradient of the whole valley, it's how much it will flow down through there, through that porous material, and if we get a gradient of more than, say, 15 or 18 feet to the mile, why, it flows more water over that spring.

Q How would you relate a hydrologic head to the amount of recharge you get during a flooding period; I mean, we've had, as you've shown on Plaintiff's Exhibit 18, different amounts of recharge over these years. How was that recharge related to the hydrologic head, and therefore to the flow of the springs?

A The more recharge we get above it, the faster the springs are going to flow and the quicker it's going to

drain out the excess heads, the excess water we have in the basin.

Q Yesterday I asked you a question regarding the nature of Mr. Newhouse's well, and you didn't have anything to refer to, and you were relying on your memory; I'm now going to hand you a document, and could you please describe for us what that is?

A This was a log of the Newhouse Well, as was given me by the D.O.E.

Q Department of Ecology --

A Yes.

Q -- sent you that copy, then?

A Yes, made available to me by them.

Q I'm going to ask you a few questions; from this log of the Newhouse Well that was sent to you by the Department of Ecology, to what depth does that log indicate that the Newhouse Well was drilled?

A To 83 feet.

Q In what depth, or between what depths is that well perforated?

MR. TORVE: Your Honor, I'm going to object to reading off the document, unless it's admitted. I assume it's not, hasn't been admitted yet?

MR. GERMERAAD: I haven't marked it. I will have it marked.

THE COURT: Let's get ir marked.

MR. GERMERAAD: Mark it for identification.

(Thereupon, Plaintiff's Exhibit 35 was marked for identification.)

Q (By Mr. Germeraad) We now have the log of the Newhouse Well marked as Plaintiff's Exhibit 35. From that log, would you please tell us at what depth below the ground surface the perforations have been made in that well?

MR. CERUTTI: Your Honor, defense counsel has not had an opportunity to review Plaintiff's Exhibit 35 yet. If we could have a moment?

THE COURT: You may.

(Short puase.)

MR. GERMERAAD: Would the Reporter please re-read my question.

(Read back by the Court Reporter.)

A At 60 to 65 feet, there were three rows of perforations; 40 to 50 feet, 12 rows of holes; 35 to 40 feet, there were seven rows of holes. Each row has eight holes and each hole is approximately 2-1/4 by 7/16.

Q That's inches?

A That's inches.

Q In what layer of the glacial drift in Walker's Prairie are those perforations at?

A In the looser layer. (Pause.) Would you want to ask

me --

Q I'm going to next give you a copy of Plaintiff's Exhibit 15. Would you please describe for the Court what Plaintiff's Exhibit 15 is, please?

A Hydrographs of the Chamokane Creek, the gaging station, which is located at 27 39 2N, for the years '71, '72, '73.

Q Could you tell me what is the scale along the left-hand side of that exhibit?

A Discharge in cubic feet per second.

Q And it ranges from zero to what level?

A We picked one out at upwards of 1320 feet a second.

Q Now, there is one line that is solid; what does that represent?

A Up here? In April of '71, we had an extreme flash flood of short duration, 'way up and 'way down; we got very little good of the infiltration from that flood.

Q Okay. Now, the year 1972 is designated differently; it's not a solid line; what is 1972?

A We had several minor floods, or up to two and 300 second feet, in February and March.

Q And is 1972 marked as a dash-line on that exhibit?

A Yes, it is.

Q Is 1973 indicated by a dotted line?

A That is correct.

Q I'm going to hand you Plaintiff's Exhibit 16. Is this also a hydrograph of the Chamokane Creek gaging station?

A Hydrograph of the Chamokane Creek gaging station, and here we took and emphasized the lower or critical stages of the Chamokane Creek, eliminating the peak flows, those peak flows, as it was more representative of the lower flows, the lower, critical, summer flows.

Q So what is the scale along the left-hand side of Exhibit 16?

A From zero to 40 -- 50 at the top.

Q So Plaintiff's Exhibit 16 is just on a different scale than Plaintiff's Exhibit 15, is that correct?

A Right. One we had to put there to show the peak flow, and the other we had to show the more relatively long-term, low flow.

Q And there we also have the years '71, '72 and '73 represented?

A Right.

Q Now, I'm going to hand you Plaintiff's Exhibit 19, which is a flow of the Fish Hatchery Springs. We talked some about that yesterday. One question I didn't ask, is there an indication on there of what the spring flow at Weir No. 1 at Fish Hatchery Springs is during the year 1974?

A We have every reason to believe --

Q Just, is there one, first?
A Is there one; yes, we have three points.
Q How does the flow at Weir No. 1 at Fish Hatchery Springs during 1974 compare to that Weir's flow during 1961?
A It would appear to at least start to parallel it.
THE COURT: Was that '61 or '71?
A '61. Goes clear back to '61.
Q (By Mr. Germeraad) What is the, if you were to draw a line between the three points that you have plotted for 1974, on Plaintiff's Exhibit 19, what would be the water level going over Weir No. 1, or what is the CFS flow over Weir No. 1?
A At the highest point, it would be a little over seven cubic feet per second.
Q And the lower points are --
A The lower point shown on the 1st of January would be a little lower than six, and at the end of January, right on six cubic feet per second.
Q So it's varied from roughly six to seven CFS?
A Yes.
Q How does that compare to what the flow was during 1973?
A '73, It would be, roughly 1-1/2 second feet more.
Q The high point is 1-1/2 second feet above the high point of '73?

A Yes.
Q I'm now going to hand you Plaintiff's Exhibit 20. Would you please describe what that is to the Court?
A Spokane Indian Reservation, monitoring wells, fluctuation comparison. After we had installed all of the wells, the monitoring devices in all of our monitoring wells, which we had in the, beginning June 23 of 1973.
Q And are there readings of -- How many different wells are indicated?
A We have four wells indicated.
Q What four wells are those?
A We have, I will give both the State's number and our number of it. Our South Well, the State's No. 2840 18Q --
Q And when you say the "South Well", where is that located?
A That's immediately above, immediately above the Fish Hatchery area, perhaps a half a mile to a mile.
Q What is the next well that is indicated on Plaintiff's Exhibit 20?
A We call it Brunton Well, which is 2840 17K.
Q And where is that in relation to the South Well in the drainage basin?
A Probably a mile up from it. And that was taken in particular because of it's, reaction would be identical

by measurement to the North Seagle Well, which we had long-time measurement. This exhibit is something that was continuous.

Q And the third well indicated on there?

A Is the Hill Well, which is 2840 8H·2.

Q And the last well?

A Is the North Well, which is 2940 33C.

Q Where is this North Well again?

A About, I'd have to look, about two to three miles south of the north line.

Q Of the north line of the Reservation?

A Yes.

Q In reference to Plaintiff's Exhibit 20, it compares these four wells; why is this important; how does this bear upon the study?

A This graphically shows our representation of the gradients of this water table to make the springs flow.

Q The one that has the least decline is the South Well, is that correct?

A Right, right near the spillway.

Q The one that has the greatest decline is the far north well?

A That's right.

Q Why do they progress, having larger amounts of decrease from the south to the north wells?

A Because we are depleting the water faster than it's coming into the basin.

Q All of these exhibits which I have just gone through with you today, including Plaintiff's Exhibits 20,19, 16, 15, 22, 21, 23-A, B and C, do all these relate and support your conclusions dealing with the effect of ground water flow and surface water diversion on the flow of the springs and therefore the flow of the Lower Chamokane?

A Yes.

Q I'm going to hand you Plaintiff's Exhibit 29, and would you please tell us what Plaintiff's Exhibit 29 is, please?

A A report of an inventory and study, water resources and utilities, Spokane Tribe of Indians, Spokane Indian Reservation.

Q And is this a report that you made?

A This is a report I made, yes.

Q In what year did you make this report?

A It was filed in '71.

Q This was given to the Tribe pursuant to the contract of study that you performed for them?

A Right.

Q I'm going to hand you Plaintiff's Exhibit 30 and ask you what that deals with?

A A supplemental preliminary report, irrigable lands below elevation 2200, Spokane Indian Reservation, Spokane Tribe of Indians, Spokane Reservation.

Q Are you the author of that report as well?

A Yes.

Q When was that submitted to the Tribe?

A In 1973.

Q Do you think you could approximate a month during 1973 that you probably gave them that report? Can you remember?

A I would have to look it up in the records. It was probably earlier in the year, yes.

Q I'm now going to give you Plaintiff's Exhibit 3-6-74-29, and tell us what that exhibit is, please?

A This is a Reservation-wide exhibit, with, okay, emphasis on the Chamokane, which is probably 50 percent of the water we're talking about, but it also goes into stock water, and everything in connection with water on the Indian Reservation.

Q Does Plaintiff's Exhibit 3-6-74-29 include the data in Plaintiff's Exhibit 29 and 30 and bring that up-to-date?

A It includes it and updates it, yes.

Q What is the date of that report?

A November, '73.

Q And if you can, can you tell us when that was accepted

by the Tribe?

A Within the last few days.

Q Is that more or less your final report on that study?

A Yes.

Q I'm now going to hand you what is marked as Plaintiff's Exhibit 27. How do you characterize that overall exhibit; what is that exhibit?

A I think it characterizes me, I take lots of pictures, and I have, every trip that I have ever gone on, or nearly every trip, I have taken pictures for the purpose of not only the Indian part of the court, but for anybody who can, wants to see this creek in its every stage.

Q So you would say this is generally a pictorial, a photographic report of the various stages?

A Four years of going out there.

Q Generally the past three to four years of the Chamokane Creek?

A Right. It shows everything that I have seen about that creek.

MR. GERMERAAD: Your Honor, I failed to move for the admission of the Newhouse Well log, which is Plaintiff's Exhibit 35. I would like to move its admission at this point in time.

MR. TORVE: I would like to have one question on

Voir Dire on the exhibit.

THE COURT: All right.

VOIR DIRE EXAMINATION

BY MR. TORVE:

Q On the handwriting on the top, Mr. Woodward, did you put that on -- Maybe I could just show the witness, it says, "Located in . . . ", and there is some handwriting --

A I doubt if it's my handwriting.

Q Do you know whose it was?

A I surely don't.

Q Do you know whether or not it came from D.O.E.?

A I surely don't.

Q Do you know whether or not -- Does this purport to indicate, at all, the elevations above sea level?

A I don't think so. I think this is purely relative and I think it just makes, it shows the depth of his well, in my opinion.

MR. TORVE: No objection.

MR. RUDOLPH: I might say, if the Court please, the State file shows what handwriting is in the State file.

THE COURT: Plaintiff's Exhibit 35 will be admitted.

(Thereupon, Plaintiff's Exhibit 35, being a Log of the Newhouse Well, was received in evidence.)

Direct Examination, Continuing:

BY MR. GERMERAAD:

Q Mr. Woodward, I'm going to ask you to get out of the stand because these exhibits I'm now going to show you are rather voluminous. I'm showing you Plaintiff's Exhibit 28-1 through 28-8. Could you please just tell us, describe what this exhibit is, please?

A It's an aerial photograph showing the entire length of the Chamokane Creek.

Q And the different series of pictures shows the different portions of the creek?

A Right.

Q And there is no date written on these, but do you know when these photographs were taken?

A These were the -- 1968, and I would stand corrected; 1968.

Q And you obtained these, did you obtain these from the Spokane Tribe?

A Yes, the Spokane Tribe furnished me this group here.

Q Mr. Woodward, what I would like to do, do you still have your red felt pen?

A Yes.

Q I would like you to use the red felt pen, if you could indicate on one after another the course of the Chamokane?

A Can I put it in blue?

Q Okay, put it in blue, blue for water.

A (Marking on exhibit.) This has to be quite generalized because it does squiggle all over the place. Is that all right?

Q Yes. The reason I'm asking you to do this is so the Court and all parties can be able to have an aerial view of the creek.

A (Drawing on exhibits.)

THE COURT: Counsel, perhaps you can finish that during the noon break, it's just for illustrative purposes?

MR. GERMERAAD: I believe the United States just has one further question. I believe the Tribe has a few questions, but I have only one more question to ask.

Q (By Mr. Germeraad) Mr. Woodward, you have spent four years of study on the basin, and you have reviewed the many studies, parts of your studies that you have made, topographical, geological, the well logs, the monitoring the flow, these are all in evidence, graphically, as exhibits. To conclude your testimony, would you please give us a short summary of the conclusions that you have come to as to the nature of this stream in the basin, and its interrelationship, the precipitation,

the ground water, and the surface flows, and what factors affect the surface flows of the Lower Chamokane?

A I think the Chamokane Creek is one of the most fragile streams to determine that I know of in Eastern Washington. It is one of the most, best full-time summer flow creeks that I know of in Eastern Washington, for maintaining fisheries, or for other purposes, and from a human pollution standpoint, one of the three common pollutions, and I'm not talking about cow pollution, but people pollution.

Q Could you --

A I think also it's the most temperamental from the standpoint of how a flood hits it, and how this water table will receive it, of any stream I know. We can get a flood which, can get a flood that can go right on through it, or we can get a flood that will be absorbed, absorb every bit of it.

MR. GERMERAAD: Okay, that's all the questions I have, your Honor.

THE COURT: I understand the Tribe desires to --

MR. RUDOLPH: Yes, if your Honor please, we will certainly not attempt to duplicate the questions which the United States has already asked, and only to supplement a few additional points.

DIRECT EXAMINATION

BY MR. RUDOLPH:

Q Mr. Woodward, I believe the exhibit, I'm not sure whether the one on the board shows the entire Reservation and all other streams on it; would you tell us, if there is any other all-weather stream on the Spokane Reservation comparable to the Chamokane?

A We have an all-weather stream, the Little Chamokane, adjacent to it.

Q Tell us a little more about that.

A It's a much smaller-flow stream to the drainage area, and it has also been our thought, and in discussions with the Tribe, too, if and were there ever a surplus, that that could be made a more nearly productive, fish-productive stream, even comparable to the Chamokane.

Q How would that be comparable?

A Even by diversion of the Upper Chamokane, if there was a surplus.

Q Are you saying, are you talking about cutting water from the Chamokane over to the Little Chamokane?

A More particularly the flood water where we could perhaps store it in the Chamokane.

Q How far from the Chamokane is the Little Chamokane?

A Parallels it probably a mile and a-half to two miles away.

Q Now, what is its flow in the summer, and what is its constancy of flow?

A Quite constant. Probably it's two or three second feet, four.

Q Well, is that eventual minimum, is that what you're saying?

A That's absolute minimum, yes.

Q Any other streams that the Reservation has comparable to the Chamokane?

A I know of no other.

Q Have you, in your studies, given consideration to the temperature of the Chamokane?

A We give gaugenal (phonetic) temperature readings, and as the fish and wildlife people were going to conduct a continual one, we cooperated with them on theirs, and that will come out on the later report.

Q Do you have some general conclusions as to temperature of the Chamokane?

A The temperature of the Chamokane is directly related, to, the more water we get in, the cooler water we get, that's particularly later in the day, and in the summer months.

Q Is there a variant from the springs to the Lower Chamokane near its confluence with the Spokane River?

A Yes, there is.

Q What about the constancy of the temperature at the springs themselves?

A Quite constant.

Q What is the effect of temperature rise in the water accompanying decline in flow on the availability and utility of that stream as a fish habitat?

MR. REKOFKE: I don't think the witness is qualified to testify in this area.

A My answer would indicate that I --

MR. RUDOLPH: Well, --

THE COURT: I think he is no qualified as a fish biologist, or whatever the proper term is now. I'll sustain the objection.

MR. RUDOLPH: Very well, I'll withdraw the question.

Q (By Mr. Rudolph) What effects are there on the stream, on the quality of the Chamokane, because of the diversions, which you have testified to, other than mere diminutions in flow?

A It would have to be somewhat in pollution; the less water, the more pollution. We find that later in the summer, as we get less flow, we get more algae growth.

Q Have you observed that in the Chamokane?

A Yes, we have.

Q And where does this more algae grow?

A In the Lower Chamokane.

Q To what extent?

A To the extent that in our measurement of flow, we would estimate, just in our hydrographs and how they related to flow on the Chamokane. In other words, we would gather up as much as a tenth, or even two-tenths algae growth on the rocks diminishing in this area.

Q Are the effects you have observed directly related to the diminution in flow?

A Yes.

Q In your testimony previously, I believe you referred to the sealed-off area, I'm referring to Exhibit 10, on which you marked a red line where I'm placing the pencil, and as I recall your testimony, you felt that area west of that was sealed off.

Would you describe for me what the southerly portion of that sealed-off area would be, if you are able to?

A I don't get your question; I'm sorry.

Q You were referring to the Upper Chamokane?

A Yes.

Q Or the Camas Valley area, and you drew a red line along the lateral moraine and described this as being sealed off, but since your line is more or less vertical, I'm unable to find a lower line, and am asking you if you

can establish the southerly line of that sealed-off area?

A At that point where the surface waters go through the cut between Camas Valley and into the Chamokane Valley.

Q Would you come over here a moment, please?

A I'll try again.

Q Now, possibly referring to the map, and rephrasing the question, if I can, what are the rough confines, at least on the east and the south, of what you have described as a sealed-off area?

A I feel Swamp Creek is strictly in here. I think that anything that is coming above Swamp Creek --

Q Well, now, you have referred to Swamp Creek, which is east of your red line?

A Right.

Q And do I understand from your answer that you consider the Swamp Creek area east of the red line as being in the Walker's Prairie?

A Part of it.

Q My question is: What is the southerly point of the sealed-off area in the Upper Chamokane?

A Right across through here.

Q In essence, you would extend the red line on over to the --

A Into the watershed.

Q Very well. You were referring to studies which you had made and plans which you had developed for the irrigation of various areas of land, and I think, referring to Exhibit 34, if I'm remembering correctly, and you've referred to 1880 acres, and then to a larger block of land, I may be repeating a couple of questions, and I'll attempt not to, as to all of those lands, would you state whether it's feasible or not feasible to irrigate them from the Chamokane?

A Economically feasible, yes.

Q What is your estimated cost in determining economic feasibility as to those, the irrigation of those lands from the Chamokane, as compared with proposed plans for irrigating those same lands from other sources?

A Due to the proximity, it would be cheaper to irrigate them from the Chamokane.

Q Do you know what is the priority of the plan, then, to irrigate these lands from the Chamokane?

A In our recommendations to the Tribe, they were at the very lowest priority.

Q And if the cost would be less to pump from the Chamokane, why is the plan to irrigate from the Chamokane of the lowest priority?

A I believe that the Chamokane has a greater esthetic value than it does have an agricultural value. That is

my opinion.

Q Do you mean only esthetic?

A Esthetic, recreation, fishing.

Q In your opinion, are those uses the highest and best uses to be made of the Chamokane?

A In my opinion at this time, yes.

Q What is the minimum low flow that should be maintained in the Chamokane in order to accomplish those purposes?

MR. TORVE: I object to that again, I think it's asking for a conclusion based on expertise he does not have, and we already have an objection to this, testifying as to fish matters, and I think this is a duplicitous question.

THE COURT: Well, that may be true of the fish, but he's also testifying regarding recreational use. I will let him answer.

A My answer will be supplemented by fish deal. My thinking is, it should be a 30 second foot stream.

Q (By Mr. Rudolph) Referring to the testimony which you gave concerning decline in the water level over the last several years, and recharging in the winter, and the delayed effect of ground water diversion upon stream flow, the question which I want to ask you is, why isn't the detrimental effect of the diversions, and

why isn't that effect corrected by water recharge in the winter season?

MR. REKOFKE: I'm going to object to the question; it assumes something not testified to.

MR. RUDOLPH: Well, I think he has testified to that.

THE COURT: I think he has gone into that. He may answer the question.

A I think it is repeating what I've said, that I don't believe that we can depend on next year's season being the fine runoff season we have had this year.

Q (By Mr. Rudolph) If you could count every year on a recharge such as just occurred,would pumping from the ground water still be a problem?

A Yes.

Q Why?

A If it were like last year?

Q Well, if you could count on every year on a recharge such as just occurred, would pumping from the ground water still be a problem?

A This year we would, we would probably just keep up, this coming year.

Q Can you explain that?

A Pulling out what we're recharging this year, we could probably make it through the '74 irrigation year and

still maintain probably a 30 second foot this year.

Q And --

A And this is a very abnormal year.

Q And what, if that pumping is continued, as it has been in the last several years, if that's continued in '74, what would you anticipate to be the effect in 1975?

A I would expect the same drop I have seen in the one, two and three.

Q When you say "the same drop", are you referring to the drop in ground water level as is demonstrated on exhibit --

A Yes.

Q -- 18?

A Yes.

Q And when that drop in ground water level as exhibited on Exhibit 18 occurs, what do we have happening to the flow of the Lower Chamokane?

A Diminution.

MR. RUDOLPH: I would ask Mr. Dellwo if he had any other questions, but I can't see him.

THE COURT: Well, let's --

MR. RUDOLPH: I assume I have none.

THE COURT: Court will be in recess until 1:30.

(The noon recess taken at this time.)

Hon. Marshall A. Neil, Judge
Spokane, Washington
Tuesday,
March 12, 1974
1:30 P.M.

MR. RUDOLPH: I have no questions, your Honor.

THE COURT: Now, Cross-examination, have you people worked out any plan of attack here, that anybody would like to lead off?

MR. DUFFORD: State of Washington, Department of Ecology, will lead off.

For the record, I'm Wick Dufford, Assistant Attorney General.

CROSS-EXAMINATION

BY MR. DUFFORD:

Q Mr. Woodward --

MR. GERMERAAD: Your Honor, before Mr. Dufford begins, can I inquire as to how many attorneys the State of Washington is going to have cross-examining Mr. Woodward; are we going to have two complete, different sets of cross-examination by the Department of Ecology and then again by the Department of Natural Resources?

THE COURT: I assume they're different interests, counsel. We have got to watch duplication here, and if somebody has covered it, why, there is no use

plowing the same ground again, but different defendants have different interests, so I can see one counsel representing each department.

Q (By Mr. Dufford) Excuse me, Mr. Woodward, at several points in your testimony, you stated that water resources of the Chamokane Creek is equal to about one-half of the water available on the Reservation; did that assessment include waters in the Spokane and the Columbia Rivers?

A No.

Q What percentage of water resource availability, with respect to the Reservation, does the Chamokane Creek represent if you include the Spokane and Columbia Rivers?

A Very minimal beyond that. It's just, comparing it to the surface water of that, that is immediately on the Reservation, and that that is coming through it on the east boundary.

Q Now, your testimony concerned, to some extent, readings taken at a U.S.G.S. gauge, which is located near the waterfall at the lower end of the Chamokane Creek?

A Yes.

Q What is the total period of records on that gauge?

A Approximately three years.

Q And is there any other stream-gauging information available prior to that time?

A It's only very spotty and we did not give it too much recognition, as it could vary from day to day, and from time to time.

Q When you say you "didn't give it too much recognition", did you rely entirely on the three years of records on the gauge?

A Yes.

Q Now, there is another gauge, I gather, U.S.G.S. gauge, near the north boundary of the Reservation?

A That has been put in very immediately and was done primarily for the high water flows.

Q When you say was "put in very immediately", when was it put in?

A I believe it was in June of this year. I would have to check that closer.

Q Is there any source of gauging information at that location prior in time?

A Yes, all through our, we had a, all through the low water period, we had, we had a weir just north of the bridge and we did read that weekly.

Q How long was that weir there?

A Throughout the period of our studies; about three years.

Q Now, in connection with your testimony with respect to geology and the glacial periods, you had reference to a gentleman named Weaver. Could you tell me who he was?

A Charles Weaver, and that was a State Report, No. 20.
Q Do you know anything about Mr. Weaver?
A He was a geologist, and primarily, his primary was of regular geology, and the water geologist of the area, yes.
Q Did you know him?
A No.
Q Well, with respect to the character of the soils and lands in the Chamokane drainage, and the geology of the area, you testified about some seismic studies?
A Yes.
Q How many transects were run?
A Two complete ones and two spot ones at the springs.
Q And those gave you a cross section?
A Yes.
Q What about the lateral boundaries of the drainage basin, did that show you anything about what the character is on the sides?
A It ran from border to border of the basin, as we saw it.
Q Well, now, referring you now to Exhibit 10, can you tell me what kind of geologic features you run into off to the west and off to the east?
A More granitic off to the east and more basaltic off to the west.
Q Is there a physical barrier along the western boundary

or the eastern boundary of the Chamokane drainage that would prevent ground water from flowing out either one of those sides?

A Yes.

Q What is that?

A It would be the bedrock.

Q Does it generally follow the boundaries that you have described on Exhibit 10?

A No. Ours is more or less, our boundary is more or less the breaking point of the flatter Walker's Prairie to where she breaks up, we have lots, rock slide areas off the edge, over quite a period.

Q On the basis of information that you have, do you know where there is a bedrock all along both of those boundaries that would prevent water from flowing out either side?

A I accepted those geophysical studies as coming up at that point, yes.

Q What about with respect to the Camas Valley; what sort of barriers exist between the northern boundary of the Reservation and of that general area and the Camas Valley which would prevent ground water up there from coming down into the Chamokane drainage?

A I believe I put that in testimony and I felt that that was more produced by the lake beds and probably sealed

off more nearly by lake than bedrock, sealed off more or less as an old lake bed having been made by a lateral moraine.

Q What is the character of the earth in that moraine that would prevent water from going through, if that is the thing that is sealing it off?

A As I followed up the creek, each time I would find a very comparable amount of water at the north line, and where it goes through those two culverts, if you're familiar with them, just south and west of Colville, very similar amounts of water, I could see no appreciable additional water being added between those two areas.

Q You're talking about the surface water?

A I'm talking about the surface water or seeing any waters.

Q My question is: How do you know there aren't waters under the ground flowing down that Upper Camas Basin not following the general direction of the Chamokane?

A How do I know? I don't know. My opinion.

Q Now, you stated at some point that the gradient in the Chamokane Basin is from south to southwest, is that correct?

A Generally southwesterly.

Q Now, what sort of gradients are you talking about; are you talking about the way the stream flows?

A Both; they're parallel.

Q The ground water is flowing along the same general direction as the surface water?
A Generally the water weaves back and forth across it, but generally the same direction.
Q What is your basis for concluding that, that the ground water is going the same way the surface water is?
A I thought you meant the ground surface is going the same direction as the surface water.
Q No, I'm talking about the ground water and the surface water.
A By my well logs that were available.
Q Are you referring to the four observation wells that we have talked about?
A There are several wells. There are other wells that we did check, minor wells.
Q Maybe you should, or I wish you would, tell us where those other wells, other than the four you testified about, are located with reference to Exhibit 10?
A I believe they would be on the exhibit that shows the profile of the wells. I think we have shown several of them, six, nine.
Q Could you point out their general location for me on Exhibit 10?
A I don't think I could on Exhibit 10, but they would be shown on some of these others, and there are several

wells.

Q What exhibit are you referring to?

A To Exhibit 32. There are several of them in here.

Q This is Exhibit 6.

A I'm trying to find one here off of a profile.

MR. GERMERAAD: Mr. Woodward, would you please speak up, so the Reporter can hear to get your testimony.

A I bed your pardon?

MR. GERMERAAD: Would you please speak up so the Reporter can hear your testimony?

A I'm still trying to find what I'm going to speak about, first.

You establish these profiles --

Q (By Mr. Dufford) Excuse me, now, you're talking about what exhibit?

A Exhibit 9. We used 109, 110, your No. 2940 33C, Indian No. 178, the Hill Well, the Seagle Well, and here's one, 107A, or your 2840 18Q, and 102. We used several.

Q I count eight, is that correct?

A I think so.

Q Four of those eight are included in the observation that you testified to earlier?

A I think four of those are in addition to those, and here, if you're interested, laterally, it's bound to

give (inaudible at the board) back and forth across the --

Q Are some of these wells out in the western portion of Walker's Prairie, any of them, west of Chamokane Creek in the Walker's Prairie?

A They're both sides of the creek. Generally the west side.

Q Well, now, referring to Exhibit 10, the point of my question really is, with respect to any and all of the observation wells that you made, how do you know what the ground water is doing out here in the area west of the place where the wells were located?

A I believe those wells, there are some located west of that area.

Q If there were some wells located within that area, how does the data you acquired from those wells support your theory the ground water is flowing in roughly the same direction as is the surface stream?

A I'm going to have to say it's generally all aiming south and west, and I'm also going to refer to what I referred to you this morning, during certain seasons of the year, when we get the inflow along the creek exceeds that, we get a general flow out, and when we feel like we're getting more water flow from immediate side hills, we get a general tendency to flow toward

the creek.

Q I understand that. Do those two phenomena occur simultaneously in some cases?

A No, I don't think so.

Q Well, if it happens in one case during a flood, and the other during runoff, how --

A It could happen, I suppose, and balance out and meet someplace out in the middle.

Q Now, in your experience in this field, is it always necessarily true that these ground waters will follow the general pattern of surface waters in a given ground water basin?

A Not necessarily.

Q Is there anything that you can learn from just observing the surface water in that respect?

A I don't know where we depend on the surface water in our assumptions. We were depending on ground waters and reporting ground waters.

Q That may be true, but is there anything that the surface waters can tell you?

A Except that I believe that the ground waters are augmented by the surface waters.

Q With respect to the area by the waterfall, is there any possibility, in your opinion, that there is any underflow, any water going underneath that area that

you cannot see going over the falls?

A I have never known very much flow of water of any kind through granite, and we have a very definite gradite dike exposed in three major points, and they usually act as a barrier.

Q How deep is that?

A The granite dike?

Q Yes.

A It's exposed in those three places.

Q I understand that, but is there any possibility that it may have a breaking-off point someplace under the surface of the earth?

A I'm sure there must be someplace, but I wasn't able to locate it.

Q Now, several times you talked about upper water bank, and I wonder if you can just tell us what the water bank is?

A Well, we have as our depositors rainfall, or snow falling up as far as Togo Mountains, and the Huckleberries, they are depositors. We have, then, our depleters, and they are both man-made depleters and as our natural runoff depleters, and then we have in this intermediate area, a loose area which we assume was a bank. That is where I keep referring to this bank. And the fuller I can keep that bank, the more

stable is my normal withdrawal from my springs or from pumpage.

Q Well, is the bank the Walker's Prairie area?

A That's the main bank, yes. This that passes on through is, it just goes.

Q You said at one point, in this system, that the input and the outgo have to be equal. Is that an inaccurate statement of your testimony?

A I don't think it's an inaccurate statement; it might be a little ambiguous, but it's accurate.

Q You did mention minus evaporation and transpirational losses, assuming no irrigation diversion?

A If it's coming in here, for all practical purposes, that's the outflow, and that's where it's got to go.

Q And your opinion is that the entire outflow is caught at the gauge below the falls?

A At least at the falls, yes, the gauge at the falls.

Q So this is a completely closed system?

A At that point, yes.

Q And in your view, there isn't any possibility the water is getting out anywhere else, other than over the falls and by that gate?

A I know of no other way it can get out.

Q With respect to evapotranspiration, or evapotranspiration, in comparing input and outgo, how do you figure out a

value for that, for evapotranspiration?

A Depending on the crops used that it's in, primarily.

Q Did you, in fact, select a number and apply that to your analysis?

A I think we, in effect, took our probable input into this bank and our output and it looked reasonable, and we presumed the others to be evapotranspirational losses, primarily. We had no reason to vary from that.

Q When you speak of inflow and outflow and the numbers that were reasonable, what specific figures are you talking about?

A I don't have them before me. I would have to look for them.

Q Well, is this system of flowing in and flowing out run by nature on a calendar basis?

A No, it would be a delayed calendar; it takes a little more than a year to get through there. We can have a heavy snowfall, we can have a heavier rainfall in the upper region, and it's maybe two years before it's coming down to the lower end.

Q Well, if that's the case, what does it mean to compare the inflow for a given year and the outflow for that year?

A Oh, we're starting with some in the bank, some years we are starting with more in the bank, we get that one

bank filled, we're starting to get more in the bank, and it's two or three feet higher, and it's a continual thing. It might take two years to run it through that bank.

Q I understand that, that that is your testimony, but I don't understand, therefore, how you can compare inflow and outgo in a given year, or what the significance of those figures are?

A (No response.)

Q Let me move to something else. With respect to the four test wells, first of all, can you explain the concept of transmissivity?

A Yes.

Q Could you --

A In any type of material, water will flow at a given rate, depending on its porosity, how fast it goes through the certain material. We find that in, in this particular part, we find real rapid flow in the upper areas, and we find very, very slow flow in the low areas.

Q Well, did you do any transmissivity testing?

A Yes, we did, we did two permeability tests.

Q What is the difference?

A One is related to the other.

Q What was the nature of those tests?

A We took soil samples, and a, in the lower reaches, we

took soil samples, which was comparable to, I believe, 102, which was the closest we could get to it was --

Q What is 102, I'm sorry?

A Well, our Well No. 102, it's one of the lower ones, and near the spillway of the finer , which I keep referring to as the spillway, but we got it down below, enough below the spillway where we felt it was representative of the fineness of the material of this area.

Q Well, you took samples of the material there, is that correct?

A Yes.

Q Just in and of itself, does that tell you anything about how water is going to flow through?

A How fast it does, yes, it does.

Q How do you make that connection?

A (Witness hesitates.)

Q You have some soil?

A Yes.

Q And you're drawing a conclusion about how fast the water will go through it; how do you do that?

A I think I'm going to have to decline that, the way you put it.

Q Well, if I can't exactly state the process, please straighten me out.

A All right, if the porosity is of such a degree the

water will go through it faster and with lesser force, and that's transmissivity.

Q Do you assign any particular values, numerically, of this transmissivity?

A No, we don't have. We have computations on that, and we have carried through, mainly to bolster our thinking, and as our findings, and actual conditions, we used our scientific approach, if you please, to back up our own approach of our well studies, but it really did in the soil itself.

Q Now, what was the total period of time taken up by your study?

A Three and a-half, four years.

Q In making a study of the recharge characteristics of a ground water body, is that an adequate period of time in which to answer the questions about recharge?

A I don't think you can ever get an adequate time to really study a basin. We were blessed by these four years, and I said this before, that we had as variable conditions as we'll ever see in 100 years.

Q Well, you're saying they were variable; does that mean they were atypical, that is, untypical?

A We found, in our opinion, on the '71 was atypical over the 30- or 40-year period. We find that last year was our dryest period, and we find that last fall and

winter was our soggiest and wettest period. We felt we learned as much in four years as we could have learned in a life's period.

Q Have you described three of the years, '71, '73 and '74, as being atypical?

A That is as wide a variation as you could get.

MR. GERMERAAD: Your Honor, I think counsel is misconstruing and putting two words together. I believe Mr. Woodward's testimony is very clear that the year 1971 is an, or a typical, two words, year.

THE COURT: Do you understand?

MR. GERMERAAD: He's not using the word atypical to mean untypical.

THE COURT: Did you misunderstand the attorney?

A Well, I didn't misunderstand, but that's okay. I know what he's trying to put in my mouth, and I'm not going to put it there.

THE COURT: You might clarify.

Q (By Mr. Dufford) Well, let me use the word unusual. Assuming that we consider there might be a year which could be considered typical; are you saying three of your years in your period of study were not bad?

A I'm saying '71 was a near typical year of what we might anticipate over our 30 to 40 years, and I am saying that was immediately followed by '72, which was as

untypical as we could hope to see, it was the dryest, and then we followed, in the fall of '73 and the spring of '74, early months of '74, were as wet as I ever hope to see, so it gives us a wide range, wider than we usually deserve, to really get a feeling of what really could happen in that basin.

Q Did you, in connection with studying the recharge of this basin, do any computer modeling?

A No.

Q Is that done in such studies?

A It's accepted practice.

Q And why was it not done here?

A We actually, we had actually records carried over long periods from monitoring wells which we had established through the length of Walker's Prairie instead of having to depend upon prototypes. The area being studied was small enough so that we could actually monitor, rather than depend on a prototype.

Q Is that the only thing the computer work is used for in this kind of an analysis, is running prototypes?

A Basically.

Q Now, my understanding was that you said that there are three main kinds of layers in the aquifer, loose layer at the top, and an intermediate layer of slightly more consolidated material, and then bedrock; is that right?

A Right.

Q I think it was your testimony that the intermediate area contributes nothing to the outflow of the springs, is that your view?

A That is this minimum; flow would be minimal. That would come out of that, and I am saying that because ultimately, since there is a slope in that material, your springs would have gone, for all practical purposes, dry, but we might have been yielding seven, eight, ten, fifteen or twenty gallons a minute instead of several hundred gallons, or several thousand gallons a minute we're getting. That material holds water, is full of water, but it does not yield water, and we find that in everyplace we have deliberately pumped through, er, drilled through the loose layer down into this layer for sacrificing quantity for purity.

Q When you say, "we find this", where has that been done?

A Public Health Service has done several of those wells I pointed out to you.

Q Are those wells sealed through the upper --

A They have been purposely sealed through this loose layer.

Q And these are some of the wells shown on the --

A Some of them, some of those are shown to you on that layer.

Q Well, if that's the case, how did those wells contribute