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Trial Transcript, Vol. 58, Morning Session

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Case # 4993

File # 165

4416

IN THE DISTRICT COURT FOR THE FIFTH JUDICIAL DISTRICT

WASHAKIE COUNTY, STATE OF WYOMING

IN RE:	)
THE GENERAL ADJUDICATION OF RIGHTS TO USE WATER IN THE BIG HORN RIVER SYSTEM, AND ALL OTHER SOURCES, STATE OF WYOMING.	) Civil No. 4993

FILED
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VOLUME 58

Morning Session

Tuesday, May 12, 1981

ORIGINAL

APPEARANCES

FOR THE STATE OF WYOMING:	HALL & EVANS 2900 Energy Center One Building 717 17th Street Denver, CO 80202 BY: MR. JAMES MERRILL and MR. MICHAEL D. WHITE, Special Assistant Attorneys General and MR. SCOTT KROB
FOR THE UNITED STATES OF AMERICA:	MR. JAMES CLEAR and MR. JOSEPH MEMBRINO Attorneys at Law Land and Natural Resources Division Department of Justice P.O. Box 7415 Benjamin Franklin Station Washington, DC 20044 and MR. THOMAS ECHOHAWK Attorney at Law Land and Natural Resources Division 1961 Stout Street Denver, CO 80294
FOR THE SHOSHONE and ARAPAHOE TRIBES:	WILKINSON, CRAGUN & BARKER 1735 New York Ave., N.W. Washington, DC 20006 BY: MR. R. ANTHONY ROGERS
CLERK TO THE SPECIAL MASTER:	MR. LEO SALAZAR Attorney at Law 701 Rocky Mountain Plaza Cheyenne, WY 82001
ALSO PRESENT:	MR. BILL DEVINE of Hall & Evans

THE SPECIAL MASTER: Ladies and gentlemen, we will please come to order.

Mr. Echohawk and Mr. Clear.

MR. CLEAR: Your Honor, the United States would like to have called Tom Stetson to the witness stand.

THE SPECIAL MASTER: No middle initial?

MR. STETSON: M as in Michael.

MR. CLEAR: M.

THE SPECIAL MASTER: All right, Mr. Stetson, you haven't been sworn yet. Would you please raise your right hand?

THOMAS M. STETSON

was called as a witness by the United States and having been first duly sworn, testified as follows, to wit:

DIRECT EXAMINATION

BY MR. CLEAR:

Q Mr. Stetson, could you state your address, please?

A Business address is 550 Kearney Street, San Francisco, California 94108.

Q And what business are you in?

A We are consulting civil engineers.

Q What is the name of your business?
A Stetson Engineers, Inc.
Q And what position do you hold with that company?
A I am the president of the firm.
Q Are you a registered civil engineer?
A Yes, sir.
Q In what state?
A California.
Q Would you briefly run through your education and professional experience?
A After graduating from high school I attended Sacramento Junior College in Sacramento, California for a year and a half. I attended the Univeristy of California at Davis for a half year. I attended the California Maritime Academy at Tiburon, California for a year. After that I was called into the service in the Navy in the summer of 1941, a few months before the war started, so I did not finish college and I did not get a degree. While I was in the service I took Armed Forces Institute courses in civil engineering and got a diploma finally from the International Correspondence School. While I was in the Navy I was in the Navy Intelligence. I was

stationed first at the District Intelligence Office in San Francisco. After the war broke out I was transferred to a branch intelligence office at the Naval Air Station at Alameda, in regard to the intelligence work for the Pacific, what they called the Pacific Naval Air Bases. In about August of 1942, I went overseas with a combat intelligence team to the South Pacific. I spent the remainder of the war in the South and Central Pacific, came back to the states in 1944 for 30 days leave and then went back out. And, my duties for those three years was in primarily aerial mapping of the islands in the Pacific, preparing hydrographic charts, aerial bombardment charts, intelligence charts and that type of thing. When I returned from the service in October of 1945, I took a job with the State of California division of forestry. I worked there through 1948 as an assistant forestry engineer. Then, I transferred to the State of California Division of Water Resources, where I was an assistant civil engineer. With the State, my first assignment was a water resources investigation of Lake County, in

Northern California. At that time the State was engaged in preparing what became known as the State Water Plan and there were a number of cooperative investigations with various counties where they had water supply problems. And, on those cooperative investigations, they would each last about two years, and we would inventory the water resources of the county, inventory the current water uses, both domestic, municipal, industrial and agrigultural. We would have our soils people classify soils and determine irrigable acreage. We would go through the normal consumptive use studies, the efficiency study and water development studies to determine how much water could be developed in the county, and how much water could be used in the county for present and future purposes. We completed the Lake County investigation in early -- late 1950. I went back to Sacramento and wrote up the draft report on that study. In July of 1951, I was sent to Ventura County in Southern California to conduct a similar study but on a much larger scale. We completed that study in 1953. At that time I was employed by the County

of Ventura as a full-time consultant to their flood control and water conservation district, to attempt to develop some of the projects that we had recommended the county should develop. After about eight months it became apparent that the county did not either desire, or have the funding to go ahead with these large projects, so I went back to the Division of Water Resources, the Los Angeles office, where I was a senior hydraulic engineer.

My duties there were in connection directly with the State Water Plan for all of Southern California, that is from San Luis Obispo County on the north to San Diego County on the south, the entire, what we call South Costal Area. We had a field office in San Luis Obispo and a field office in San Diego, both of which were under my jurisdiction, but I was based in Los Angeles.

In addition to those duties, we reviewed all federal reports on projects in Southern California under the law which requires the Governor to respond within 90 days, and we did miscellaneous water supply studies for state

institutions such as the prisons and agricultural stations and that type of thing.

In 19 -- July 1st of 1955, I transferred to another state agency called the Colorado River Board of California, where I was supervising hydraulic engineer and I was invited to take that position because of the filing of Arizona versus California lawsuit. So, I worked for the Colorado River Board in preparation for that lawsuit until of April of 1957, and in April of 1957 I established my private practice and became a consultant to the California Attorney General's office on the Arizona versus California case.

* * * * *

A (Continued) In private practice we always specialized in water resource treatment, in the water resources field, although we have done some other city engineering type work, but very little of it.

Q What projects aside from the Wind River Project are you currently involved in?

A Projects of any type?

Q Well, general, not everything, but water resource projects?

A Well, we have -- Much of my time is spent on the Kern River in Southern California, in the Southern San Joaquin Valley. I'm a consultant to the City of Bakersfield and have been since 1965. We were involved, we were originally hired to determine whether the City of Bakersfield should take its supplemental water from the state water project, from the proposed Central Valley East Side Project or try to get local water. And after making a study of this, we advised them to do, follow several alternate cources. One was to attempt to contract for state project water, but because the state project water comes down the West side of the valley and the city is on the

2-2

east side of the valley we proposed that with the state project water, that they exchange that for Kern River water owned by water Districts on the west side, so they could take the state project water and the city on the east side could pick up the Kern River water, which is of a better quality and much cheaper. It's right there, you don't have to pump it across the valley.

As a result, we entered into negotiations with various Kern River interests in attempting to make exchange, and we were not successful. We then determined that much of the water established under the old Miller-Haggin Agreement was formally used for irrigation in areas that were now urbanized by the City of Bakersfield. So we filed a lawsuit against the Kern River interest in the hope of getting some of that water for the City. As a result of that, Tenneco, Tenneco West, they call it, which had bought out the old Kern County Land Company - after two or three years of litigation, offered to sell to the City of Bakersfield all of its Kern River Water rights and so the City purchased

2-3

those, they purchased about 300,000 acre-feet per year of water rights, much of which was committed to one large irrigation utility. We sold off that irrigation utility to the water district that was -- it was located to a public water district, and retained to the City about]50,000 acre-feet of water rights, including a small irrigation utility. And then we entered into contracts to sell the excess water the City now had to other irrigation districts on a long-term contractual basis. And the City's operation has a lot of large canals, diversion facilities, delivers this water to the contractors as well as delivering water to the irrigation utility, which it still owns and operates.

I'm also District Engineer for the San Ynez River in Santa Barbara County, which serves both, it's irrigation and municipal type operation; the San Gabriel Valley Municipal Water District, which is strictly a municipal water operation; the Upper San Gabriel Valley Municipal Water District, which is mainly municipal, there's some small amount of irrigation left in San Gabriel Valley, but not much.

stetson-direct-clear

2-4

We have represented a number of other districts in the past, Dos Palmas Irrigation District down in Coachella Valley; did a study for it to develop about 8,000 acres of land for irrigation. They had a problem with their water rights and were never able to get their water rights and the project was never built.

In the past, back in 1959 and '60 we were involved with construction of the Sausalito Irrigation District Projects, which takes water from the prime Kern Canal in Tellary County. That's a closed pipe system, they pump out of the canal into a closed pipe distribution system.

We represent the City of Ventura on its water rights matters, we represent the City of San Bernadino on its water rights matters, City of Glendora. We're consultants for the City of Los Angeles Water and Power, we are consultants to the State of California, in addition to its Colorado River litigation. We have four or five other contracts with them on water rights, usually on water right matters.

Q Have you ever testified or qualified as an expert in litigation before?

2-5

A Yes, sir.

Q Federal court?

A Well, the Arizona versus California case.

THE SPECIAL MASTER: Just a minute. I don't know what's going on, but it's something.

MR. ROGERS: There's fire trucks down here, it's coming out of the Supreme Court Building.

THE SPECIAL MASTER: Let's take five or ten minutes.

(Off the record.

MR. CLEAR: Your Honor, as you probably know, Mr. Stetson is going to testify today as to the water duty of the, what's been called the historic lands except as to Type VIII, which Dr. Mesghinna will testify to.

THE SPECIAL MASTER: Except what?

MR. CLEAR: Except the Type VIII lands.

I would at this time like to offer Mr. Stetson as an expert.

THE SPECIAL MASTER: Let me just ask one or two questions. Mr. Stetson, about how many employees do you have in your firm?

THE WITNESS: Oh, 20 to 22, it varies. We have two offices, one in San Francisco, and

one in West Covina, and we have about ten or]] people in each office.

THE SPECIAL MASTER: Were you ever familiar with the problems that Harold Johnson had with New Melanos Dam near Hometown?

THE WITNESS: Yes, sir.

THE SPECIAL MASTER: I laboured with those a good many years with him and came to hearings.

THE WITNESS: I imagine you did.

THE SPECIAL MASTER: That still isn't built, is it?

THE WITNESS: It's built, but they won't let --

THE SPECIAL MASTER: No water --

THE WITNESS: No water in.

THE SPECIAL MASTER: There's a dam without water.

All right, Mr. White.

MR. WHITE: Could I just ask a couple questions on voir dire?

THE SPECIAL MASTER: I figure you two know each other from depositions, but go ahead.

stetson-direct-clear

VOIR DIRE EXAMINATION

BY MR. WHITE:

Q Mr. Stetson, you testified, you've indicated that you've testified as an expert witness in Arizona versus California; is that correct?

A Yes, sir.

Q And what was the subject matter of your testimony?

A I testified on three different occasions in that case. The first occasion was on the safe yield of the Gila River System in Arizona and New Mexico. The second occasion was the long-term safe yield of the Colorado River, the mainstem Colorado River in the lower basin. And the third matter was in connection with the boundary dispute with the Colorado River Indian Reservation. The -- We disputed boundary in the State of California.

Q Mr. Stetson, could you describe any professional experience that you personally have with respect to the duty of water in the State of Wyoming.

A In the State of Wyoming?

Q Yes.

A It has all been in connection with this case.

MR. WHITE: Your Honor, while if we were in

California we undoubtedly would seek the services of Mr. Stetson, we're not in California, we are in Wyoming. We would object to the acceptance of the Court of this man as an expert witness with respect to the duty of water in Wyoming where he has no experience, especially with respect to the subject matter of this litigation for which he, by his testimony, appears never to have been qualified before as an expert witness.

THE SPECIAL MASTER: Objection's overruled, the witness will be admitted as an expert witness.

DIRECT EXAMINATION (CONTINUED)

BY MR. CLEAR:

Q Now, Mr. Stetson, while discussing your qualifications, I did mention about what you're to testify about concerning historic lands. Can you explain in more detail than I did of the study you undertook for your testimony today?

A What we undertook was to determine the duty of water requirements, and annual water requirements for the adjudicated trust lands, the unadjudicated trust lands, which are now in use and the Type VII idle lands, idle trust lands.

2-9

Q Now, when you said unadjudicated trust lands and adjudicated trust lands, Type VII lands, as you know, Dr. Mesghinna testified to what's been called future lands which are not now receiving water. Are the lands you're about to testify to receiving water?

A They are either receiving water or have received water in the past, yes, sir, but they are not the future lands which Dr. Mesghinna testified to.

* * * * *

Q. And are all these lands within the Federal Indian Project or the Midvale Irrigation District or other irrigation districts?

A. Some of the lands are in the Federal Indian Irrigation Project, some of the trust lands are in the Midvale Irrigation District, and some are in the LeClair Irrigation District, but much of the trust lands are in what we call nonproject areas, they are outside of the Federal Irrigation Projects and outside of those two irrigation districts.

MR. CLEAR: Your Honor, we have had for some time a map prepared by Mr. Billstein, it was not prepared by Mr. Stetson. And I wanted to use it for illustrative purposes to help everyone follow the testimony a little bit, and I don't intend to use it for substantive evidence. And it shows where the irrigation projects are.

THE SPECIAL MASTER: I'm sure Mr. White would have no objection to that.

MR. WHITE: As long as it is for illustrative purposes, Your Honor.

MR. CLEAR: That's right.

THE SPECIAL MASTER: Okay, Mr. Clear.

MR. WHITE: I assume the United States will

provide us with a copy of it?

MR. CLEAR: I don't know if we have another copy, but we may. I think we do.

Your Honor, let me mark that. I don't have a sticker on it.

THE SPECIAL MASTER: Will this be ultimately made an exhibit or offered later in the case, do you think, Mr. Clear?

MR. CLEAR: Well, I think we'll identify it for the record with a -- and if we offer it,just for illustrative purposes.

THE SPECIAL MASTER: All right.

(The instrument hereinbefore
(described was identified as
(U.S. Exhibit WRIR C-276.

MR. CLEAR: Your Honor, I have marked for identification United States Exhibit C-276, which we will use for illustrative purposes during the course of Mr. Stetson's testimony.

Q. (By Mr. Clear) Mr. Stetson, could you describe for us generally the various components of the Wind River Federal Irrigation Project?

A. Yes. May I step up to the exhibit?

THE SPECIAL MASTER: Sure.

A. We have the Upper Wind Unit, which comprises the Wind

River bottom lands and the so-called Dinwoody bench lands as the uppermost on the Wind River system. Then down in the Little Wind system we have the Ray Unit, uppermost on this watershed, the Coolidge Unit and the Subagency Unit moving downstream toward the Wind River. Then back onto the Main Stem of the Wind River we have the small Johnstown Unit and the Left-hand Unit. There are also some trust lands on the other side of the -- the northerly side of the river in the LeClair Irrigation District and some in the Midvale Irrigation District.

THE SPECIAL MASTER: Is the area in the Midvale District marked on that exhibit?

THE WITNESS: Well, the boundaries of the district are shown and there's some -- there should be some trust lands in there, although I can't tell from these boundaries if there is. I believe these so-called historic lands here are not necessarily complete.

MR. CLEAR: I think there are some inaccuracies on that map, Your Honor, and we are relying to -- as we said, Mr. Billstein prepared this in his testimony, but we are relying on the identification and location of those on the hydrographs and photographs that he

introduced into evidence.

THE SPECIAL MASTER: All right.

THE WITNESS: It is a relatively small area in the Midvale Irrigation District.

Q. (By Mr. Clear) Are you familiar with the rivers and streams which service those various units? Can you identify those?

A. Well, of course, the Upper Wind is served mainly from the Wind River with its East Fork and its various tributaries, Dinwoody Creek. As we come downstream, of course, you have the Midvale Project diverting much of the water, but the Johnstown and Lefthand get most of their water out of the Wind River. On the Little Wind we have the various branches of the Little Wind River; North Fork, Mid Fork or Main Fork and South Fork; and we have the Popo Agie which served the combination of the Ray Unit, Coolidge Unit and Subagency Unit.

Q. Mr. Stetson, how did you determine the location and acreage of the nonadjudicated lands currently receiving water within the Type VII lands?

A. We received from HKM Associates maps showing the locations of the unadjudicated trust lands in use.

Q. And are you familiar with the testimony of Mr.

Billstein and Mr. Waples?

A. Yes, I have read the transcripts.

Q. And these are the lands they identified in their testimony?

A. Mr. Billstein testified on the unadjudicated trust lands and Mr. Waples testified on the arable Type VII lands, as I recall.

THE SPECIAL MASTER: Mr. Stetson, when you say Type VII lands, what do you mean?

THE WITNESS: Well, I'm using the same definition that I hope everybody is using, that the Type VII is idle lands which are trust lands that at one time used water but are not now using water.

MR. CLEAR: Your Honor, I think the types were discussed somewhat earlier in the testimony --

THE SPECIAL MASTER: Yeah, I recall that.

MR. CLEAR: -- and Exhibit, I think, HB-8, which was a State exhibit, was introduced, and I have a copy of that if you want.

THE SPECIAL MASTER: No, that's quite all right. I just --

Q. (By Mr. Clear) How did you determine the acreage and the location of the so-called adjudicated lands?

A. The adjudicated lands?

Q. Yes.

A. Those were furnished to us by HKM Associates.

Q. Now, Mr. Stetson, how did you come about determining the water duty for the adjudicated and nonadjudicated lands receiving water within the project areas?

A. Within the project areas we reviewed the historic record of acreage served and water diverted on an annual basis.

Q. When you say "acreage served", is that all the acreage, Indian and non-Indian and so on?

A. All the acres classified as irrigated acres in those respective years. We went through the historic record, and for the years in which there were data for both irrigated acres and diversions, we used those data and determined an average for each unit; that would be Upper Wind --

Q. Average what?

A. Average duty. In other words, the average diversion in acre-feet per acre for the irrigated acres.

Q. And once you obtained that average, what did you do with it?

A. Well, we reviewed -- we consider that to be a representative unit diversion requirement for those lands under their existing types of use.

Q. So you have assigned the average diversion requirement in acre-feet per acre, is that right?

A. Acre-feet per acre-year for each of the units.

Q. Uh-huh.

A. The three subunits in the Little Wind Unit, the Upper Wind Unit, the Johnstown Unit, the Lefthand Unit, and also for Midvale Irrigation District and the LeClair Irrigation District. Now, these unit diversion rates were derived from the total number of acres irrigated each year in those units. There were lands other than trust lands irrigated.

Q. Uh-huh. All right.

A. But we did this simply to derive the average diversion rate.

Q. Uh-huh. Where did you get the records as to the annual diversions and the irrigated acres served?

A. We got -- For the Federal Indian Irrigation Projects we got them from the BIA and the Fort -- and Mr. Crook at Fort Washakie. We obtained data from the -- for the Midvale Irrigation District and the LeClair Irrigation District from records of those districts, published data.

Q. So now, you have an average water duty -- I'm sorry, an average diversion requirement per acre, and you

took that and what, multiplied it by --

A. For each of the respective units we then looked at the acreage of adjudicated lands --

Q. Uh-huh.

A. -- in that category and the acreage of unadjudicated trust lands in use and applied the same average duty to those lands.

Q. And that total gave you what?

A. That total gave us the -- By that application, we got the acre-feet per year diversion requirement for those lands.

Q. For the adjudicated?

A. For the trust lands, the adjudicated trust and the unadjudicated trust.

Q. Could you tell us, in your opinion -- or could you tell us the number of acres in each unit -- number of adjudicated trust lands in each unit and the number of the Federal Irrigation Project and the water duty for those total acres?

MR. WHITE: Objection, Your Honor. There's no foundation with respect to the adjudicated trust lands. The Court's taken judicial notice of the state water rights that exist, the certificated water rights. There is no evidence before the Court

that the acreage contained in those certificated water rights are actually trust lands.

THE SPECIAL MASTER: The objection is overruled. You may answer.

A. In the Ray Unit of the Little Wind there were 347 acres of adjudicated lands. The average duty in that unit was 5.32 acre-feet per acre, which would indicate an annual diversion requirement of 1,846 acre-feet. In the Coolidge Unit there were 311 acres of adjudicated lands; the duty in that unit was 4.95 acre-feet per acre for an annual diversion requirement of 1,539 acre-feet. There were no adjudicated lands in the Subagency Unit. There were 492 acres of adjudicated trust lands in the Dinwoody bench area of the Upper Wind --

THE SPECIAL MASTER: How many?

THE WITNESS: Four hundred and ninety-two acres.

THE SPECIAL MASTER: Thank you.

A. The duty in that unit is 12.06 acre-feet per acre, which would indicate an annual diversion requirement of 5,934 acre-feet. There were no adjudicated trust lands in the Johnstown Unit. Twenty acres of adjudicated lands in the Lefthand Unit. In the Lefthand Unit the average annual diversion duty was 6.9

acre-feet per acre, so that would indicate an annual diversion requirement of 138 acre-feet.

There were no adjudicated trust lands in either Midvale or LeClair Irrigation Districts, so we had a total of 1170 acres of adjudicated trust lands in the project acres, and the total annual diversion requirement would come out to be 9,457 acre-feet.

Q. Okay --

THE SPECIAL MASTER: May I ask you a question now about the nature of lands that required 12 acre-feet, 4.06, as a requirement, isn't that abnormally high?

THE WITNESS: That is high. There is no question about it. If I may step over to the map --

THE SPECIAL MASTER: Sure. Dinwoody --

MR. CLEAR: Do you want a pointer? I think you're in the Master's way a little bit.

* * * * *

THE WITNESS: This is in an area in the Upper Wind River where there's apparently ample water, and they divert a large unit diversion, probably run their canals full for the ease of operation. What isn't consummed or most of what isn't consummed gets back into the river system, so it's not as if they were depleting the stream by that much, but it is a very high duty of water, there's no question about it.

Q (By Mr. Clear) Let's move on to the unadjudicated trust lands within the projects.

A All right.

Q Did you determine water duty for the unadjudicated trust lands which are now receiving water in the same manner that you determined the water duty for the adjudicated trust lands in the project?

A Yes, I did.

Q Can you --

THE SPECIAL MASTER: Is this Type VII lands that are unadjudicated or just lands receiving water like you asked?

MR. CLEAR: These are unadjudicated lands,

but they are currently receiving water from the irrigation projects.

THE SPECIAL MASTER: Are there no unadjudicated trust land that historically might have received water that are not now?

THE WITNESS: Those would be Type VII.

MR. CLEAR: Those would be Type VII.

THE SPECIAL MASTER: They're not in the figures you're giving now?

THE WITNESS: No, sir.

THE SPECIAL MASTER: Neither the ones you just have given or the ones you're about to?

THE WITNESS: That's right.

THE SPECIAL MASTER: Thank you. Go ahead, Mr. Clear.

Q (By Mr. Clear) Could you run through the acreage of unadjudicated trust lands receiving water and their water duty in the various units in the irrigation project.

A Going through unit by unit, in the Ray Canal Unit there are 782,000 acres of unadjudicated trust lands now receiving water. Average water duty is 5.32 acre-feet per acre, annual diversion requirement would be 41,400 acre-feet.

stetson-direct-clear

In the Coolidge Unit there are 6,357 acres, an average duty of 4.59 acre-feet per acre, annual diversion requirement, 31,467 acre-feet.

In the Subagency Unit there are 2,962 acres, average diversion unit is 5.26 acre-feet per acre, annual diversion requirement would be 15,580 acres.

In the Upper Wind, from the Wind River A Canal, 1,019 acres, average duty, 12.06, annual diversion requirement, 12,289 acre-feet.

Dinwoody Bench Area, 4,611 acres, average duty, 12.06, annual diversion requirement, 55,609 acre-feet.

Johnstown Unit, there are 465 acres, average duty is 6.94 acre-feet per acre, annual diversion requirement, 3,227 acre-feet.

Lefthand Unit, 1,541 acres, average duty, 6.9 acre-feet per acre, annual diversion requirement, 10,633 acre-feet.

For the trust lands in the Midvale Irrigation District there are 569 acres, average duty is 5.58 acre-feet per acre, annual diversion requirement, 3,175 acre-feet.

In the LeClair Irrigation District there are 1,271 acres, average duty is 5.48 acre-feet

per acre, annual diversion requirement, 6,965 acre-feet. So we have a total of unadjudicated trust lands within the project areas of 26,577 acres with an annual diversion requirement of 180,345 acre-feet.

Q Mr. Stetson, you've testified now as to how you reached your conclusions on the adjudicated trust lands and the nonadjudicated trust lands within the projects. How did you go about studying the adjudicated trust lands and non-adjudicated trust lands outside the projects?

A We determined the -- First of all, we established a cropping pattern for the historic lands. We had -- and this was done by climatic stations, so we ended up with acutally three different cropping patterns for a total of seven climatic stations.

Q The seven climatic stations are the same climatic stations Dr. Mesghinna testified to?

A Yes, they are. In fact, Dr. Mesghinna then, from his computer analysis, determined the consumptive use of each of these crops by months, by climatic stations.

From the consumptive use data, and depending

upon -- and some of these units we have more than one climatic zone, so we applied the consumptive use, the net irrigation requirement, which is the consumptive use less effective precipitation.

Q This is the same methodology with respect to the future lands?

A Yes, it is. We applied that to the lands in each of the units by climatic zones if there were more than one climatic zone in the unit. And that way we derived an average net irrigation requirement for each of these project areas. We then looked at the annual diversion, unit diversion requirement, and by dividing that into the annual net irrigation requirement, we arrived at an annual overall efficiency for each unit.

Q These are the efficiencies within the project now?

A This is the total overall efficiency from the point of diversion to the --

Q Right.

A To the point of use.

In that, by doing that, we found a range

of efficiencies that run from as low as 16.2 percent, which is your Upper Wind Unit to as high as 38 percent on the LeClair, 39.5 percent on Subagency, 37 percent on Coolidge and so forth. And the others are between]6 and 39.5, that's the range.

After reviewing this and recognizing that the low efficiencies in the Upper Wind Unit probably distort the average efficiencies because these averages came out for just the Federal Irrigation Project units, came out to 23.3 percent. If you eliminate the Upper Wind Unit from the calculation and just average the Little Wind, Johnstown and Lefthand, you get an average of about 34.7 percent.

THE SPECIAL MASTER: May I hear that again? If you eliminate the Little Wind --

THE WITNESS: We eliminate the Upper Wind Unit, which has the low efficiency, that's the one with the]2. -- the]2 foot diversion unit, which gives a]6 percent --

THE SPECIAL MASTER: You end up with what?

THE WITNESS: We end up with 34.7 percent

as the average overall efficiency.

Dr. Mesghinna had done some studies on various streams throughout the -- on the nonproject lands on irrigation requirements and the net irrigation requirements, and then did a theorectical analysis using, looking at the lands, the types of lands, so forth, types of soils, assuming a farm efficiency, and then looking at how these lands would be served, what the conveyance efficiencies would be, and he, in his work, came up with a range of 29 percent to 37 percent as a general range of overall efficiencies.

Also, in reviewing some of the older reports by the Bureau of Reclamation, you get some feel for efficiency, they give data on diversion requirements and consumptive use requirements. And it seems to be in the range of, using actual data, of 20 to -- low 20 percent to the high 30 percent range.

On the basis of this, it was my opinion that we could use a 35 percent efficiency as being an achievable efficiency on the non-project lands. So I have applied a 35 percent

efficiency on the nonproject lands.

Now, historically their efficiecies were undoubtedly lower than that, but I believe 35 percent is an achievable efficiency.

Q What would be the effective lower efficiency of the diversion requirement?

A The lower efficiency requires a higher unit diversion. Then from that diverted water the crop consumes so much of it, there's -- The rest is either returned to the stream or is dissapated in the swampy areas, just depends on the topography and the cover in that particular region.

Q All right. Now, you have an efficiency for the nonproject lands. Then what did you do to determine the water duty for those lands?

A All right. For the acres of either adjudicated or unadjudicated lands in use that were furnished to us, they were furnished by aerial photo number and field number. We looked at those in comparison with your climatic zone maps and applied the proper units and also the cropping pattern for those respective climatic zones, and we determined a proper average net

irrigation requirement for each of those lands, each of those parcels.

Then we used the 35 percent efficiency to divide into the net irrigation requirement to derive a diversion requirement.

Q Can you give us your opinion as to the diversion requirements for the nonproject adjudicated trust land?

MR. WHITE: Objection, Your Honor; again, there is no foundation, no evidence before the Court that these lands are in fact trust lands.

THE SPECIAL MASTER: I would -- I would overrule the objection, but ask you to restate -- You're asking for the diversion requirements for what lands, for all of the totals of the acreage that Dr. Mesghinna testified to in his report?

MR. CLEAR: No, Your Honor. These are different lands, these are adjudicated lands having --

THE SPECIAL MASTER: Unadjudicated but not a part of future?

MR. CLEAR: Not a part of future lands, Your Honor, and I believe --

THE SPECIAL MASTER: Then I will overrule it.

Q (By Mr. Clear) Could you give us your acreage figures for water duty requirements on the adjudicated trust land outside the projects?

A All right. You want basin by basin, tributary by tributary?

Q I think that would be helpful to the Court.

A We start with the Wind River Basin, main Wind. On the East Fork Wind River there were 259 acres. The indicated diversion requirement is 5.06 acre-feet per acre which would indicate an annual diversion requirement of 1,310 acre-feet.

THE SPECIAL MASTER: Three hundred and ten?

THE WITNESS: One thousand three-hundred and ten acre-feet, yes, sir.

On Dinwoody Creek there were 17 acres. The indicated diversion requirement was 5.57 acre-feet per acre for an annual requirement of 95 acre-feet.

We had zero acres on Dry Creek, zero acres on Bull Lake Creek, we have 166 acres on Meadow Creek, diversion duty, 5.43 acre-feet per acre, annual requirement, 901 acre-feet.

On Dry Pasup Creek we have 1,977 acres, diversion duty, 5.31 acre-feet per acre,

requirement of 10,490 acre -- I'm sorry --

THE SPECIAL MASTER: Ten thousand --

THE WITNESS: Ten thousand four hundred and ninety acre-feet per year.

On Crow Creek we have 2,927 acres, diversion duty, 5.13 acre-feet per acre, annual diversion requirement, 15,542 acre-feet.

On Willow Creek, 60 acres, annual diversion requirement, 5.57 acre-feet per acre, annual requirement of 334 acre-feet.

On the Wind River Mainstem, 1,338 acres, annual diversion duty, 5.54 acre-feet, annual requirement, 7,413 acre-feet.

So, for the Wind River Basin we have 6,744 acres total and a diversion requirement of 36,093 acre-feet.

* * * * *

stetson-direct-clear

Q. (By Mr. Clear) Adjudicated lands?

A. Adjudicated lands.

In the Little Wind River Basin we have lands, adjudicated lands, on four of the tributaries: North Fork, South Fork, Sage Creek and Mill Creek. On North Fork, 485 acres, the diversion duty is 5.49 acre-feet per acre; annual requirement, 2,663 acre-feet. On South Fork Little Wind, 107 acres; diversion duty, 4.94 acre-feet per acre; annual requirement, 529 acre-feet. On Sage Creek, 207 acres; diversion duty, 5.57 acre-feet per acre; annual requirement, 1,153 acre-feet. On Mill Creek, 37 acres; diversion duty, 5.57 acre-feet per acre; and the annual requirement, 206 acre-feet.

So the sum for the Little Wind River Basin would be 836 acres with an annual diversion requirement of 4,551 acre-feet.

On the Big Horn River Basin segment on the Main Stem Big Horn, 100 acres; diversion --

THE SPECIAL MASTER: On which again, Mr. Stetson?

THE WITNESS: Main Stem Big Horn.

THE SPECIAL MASTER: Right.

A. One hundred acres; average diversion, 5.94 acre-feet per acre; annual requirement, 594 acre-feet.

Cottonwood Creek, 505 acres; annual diversion requirement, 5.89 acre-feet per acre; annual requirement, 2,974 acre-feet. On Muddy Creek we have 2,901 acres; 5.43 acre-feet per acre duty; annual requirement, 15,752 acre-feet. On Five Mile Creek we have 156 acres with a duty of 5.57 acre-feet per acre and an annual requirement of 869 acre-feet.

THE SPECIAL MASTER: You said 156 acres in that Five Mile --

THE WITNESS: One hundred and fifty-six acres, yes, sir.

THE SPECIAL MASTER: Thank you.

A. For -- So that for the Big Horn River, that would total 3,600 and -- 3,662 acres with an annual diversion requirement of 20,189 acre-feet.

On the Popo Agie, we have 320 acres on the North Fork with an annual duty of 5.4 acre-feet per acre and an annual requirement of 1,720 acre-feet. On the Main Stem Popo Agie we have 40 acres; the duty is again 5.4 acre-feet per acre; annual requirement, 216 acre-feet. So we have a total of 360 acres for the Popo Agie with an annual requirement of 1,944 acre-feet.

Then we move up to Owl Creek Basin. On the

South Fork of Owl Creek, 1,620 acres; a duty of 5.46 acre-feet per acre, annual requirement of 8,845 acre-feet. On Main Stem Owl Creek we have 2,265 acres, a duty of 5.4 acre-feet per acre, and an annual requirement of 12,231 acre-feet. On Mud Creek we have 754 acres, a duty of 5.43 acre-feet per acre, and an annual requirement of 4,094 acre-feet. The grand total for the nonproject lands --

Q. (By Mr. Clear) Adjudicated trust lands?

A. Yeah, adjudicated trust in the nonproject area would be 4,639 acres and an annual requirement of -- Let me check something here, it doesn't look right.

Just a moment. I want to check a figure on it.

The adjudicated trust lands in the nonproject areas would be 16,241 acres with an annual diversion requirement of 87,947 acre-feet.

THE SPECIAL MASTER: You are now giving us the totals of Owl Creek, Popo Agie, Big Horn, Little Wind and the Main Stem?

THE WITNESS: Yes. Outside the project areas.

THE SPECIAL MASTER: Give me the totals on Owl Creek again. Forty-six, thirty-nine, and the acreage as to-- what is the total?

THE WITNESS: Owl Creek is 4,639 acres --

THE SPECIAL MASTER: Right.

THE WITNESS: And 25,170 acre-feet.

THE SPECIAL MASTER: Right. Now, those totals also again for all --

THE WITNESS: For all of the nonproject lands would be 16,241 acres, 87,947 acre-feet.

Q. (By Mr. Clear) Nine hundred and forty-seven, did you say?

A. Nine hundred and forty-seven acre-feet annual diversion requirement.

When you combine that with the project lands, you have the total of adjudicated acreage, which is the 17,411 acres, and the total diversion requirement then would be 97,404 acre-feet.

THE SPECIAL MASTER: You add the 1170 acres of adjudicated to the 16,241?

THE WITNESS: Yes, sir.

THE SPECIAL MASTER: You get what?

THE WITNESS: Seventeen thousand four hundred and eleven.

THE SPECIAL MASTER: Okay. And we add the 9,457 to the 87,000, you get the total annual requirement of how much?

THE WITNESS: Of 97,404.

THE SPECIAL MASTER: Okay. Thank you.

Q (By Mr. Clear) Let's go on to the unadjudicated trust lands receiving water outside the Federal Irrigation Projects. Did you determine the water duty in the same method that you determined the nonproject adjudicated lands?

A. Yes, I did.

Q. Would you give us the figures on the unadjudicated trust lands, nonproject lands?

A. These are the unadjudicated in use, nonproject areas. For the Wind River Basin, East Fork Wind River, 10 acres, the duty is 5.06, annual diversion requirement, 51 acre-feet. Dinwoody Creek, 154 acres; the duty is 5.57; annual requirement, 858 acre-feet. Dry Creek, 183 acres; annual diversion requirement, 5.54; annual requirement, 1,014 acre-feet. Bull Lake Creek, 26 acres; duty is 5.4 acre-feet per acre; annual requirement, 140 acre-feet. Meadow Creek, 179 acres; the duty is 5.51 acre-feet per acre; the annual requirement, 986 acre-feet. Dry Pasup Creek, 56 acres; duty is 5.2 acre-feet per acre; annual requirement, 291 acre-feet. Crow Creek, 36 acres; the duty is 5.4 acre-feet per acre; annual requirement, 194 acre-feet. Willow

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Creek, 7 acres; 5.06 acre-feet duty per acre; annual requirement, 35 acre-feet. Wind River Main Stem, 487 acres; annual duty, 5.77;acre-feet per acre; annual requirement, 2,810 acre-feet. So for the Wind River Basin we have 1,138 acres; annual requirement for diversion of 6,379 acre-feet.

In the Little Wind Basin, the North Fork of the Little Wind, 1,776 acres, with a duty of --

THE SPECIAL MASTER: What is the title on this again, I'm sorry?

THE WITNESS: This will be the Little Wind Basin. And the first one will be the North Fork on the Little Wind.

THE SPECIAL MASTER: Thank you.

A. One thousand seven hundred seventy-six acres with a duty of 5.14 acre-feet per acre, annual requirement of 9,129 acre-feet. South Fork Little Wind, 781 acres, duty of 5.11 acre-feet per acre; annual requirement, 3,991 acre-feet. Main Stem Little Wind, 386 acres, duty of 5.94 acre-feet per acre; annual requirement, 2,293 acre-feet. Sage Creek, 776 acres; the duty is 5.51 acre-feet per acre; annual requirement, 4,276 acre-feet. Crooked Creek, 69 acres --

THE SPECIAL MASTER: Sixty-nine?

THE WITNESS: Sixty-nine, yes, sir.

THE SPECIAL MASTER: Uh-huh.

A. Annual duty, 5.26 acre-feet per acre; annual requirement, 363 acre-feet. Trout Creek, 228 acres, 5.46 acre-feet per acre of duty; annual requirement, 1,245 acre-feet. Spring Creek, 178 acres; annual duty, 4.97 acre-feet per acre; annual requirement, 885 acre-feet. Big Horn Draw, 139 acres; duty, 4.94 acre-feet per acre; annual requirement, 687 acre-feet. So for the Little Wind Unit, we have 4,333 acres with an annual requirement of 22,869 acre-feet.

Then on the Big Horn River Basin we have on the Main Stem Big Horn, 2 acres, 5.94 acre-feet per acre; annual requirement, 12 acre-feet. Cottonwood Creek, 320 acres; diversion duty, 5.89 acre-feet per acre; annual requirement, 1,885 acre-feet. Muddy Creek we have 1,194 acres; annual duty, 5.6 acre-feet per acre; annual requirement, 6,686 acre-feet. Five Mile Creek, 362 acres; the duty is 5.57 acre-feet per acre; annual requirement, 2,016 acre-feet. So for the Big Horn River Basin we have a total of 1,878 acres and an annual requirement of 10,599 acre-feet.

On the Popo Agie we have on the North Fork, 112 acres; the duty is 5.43 acre-feet per acre; diversion requirement, 608 acre-feet per year. And the Main Stem of the Popo Agie, 74 acres; the duty is 5.74 acre-feet per acre; annual diversion requirement, 425 acre-feet. So the subtotal for the Popo Agie is 186 acres with an annual requirement of 1,033 acre-feet.

On Owl Creek Basin, South Fork Owl Creek, 84 acres; annual duty, 5.51 acre-feet per acre; diversion requirements, 463 acre-feet per year. The Main Stem Owl we have 46 acres, a duty of 5.4 acre-feet per acre; annual diversion requirement of 248 acre-feet. MuddCreek we have 185 acres, a duty of 5.29 acre-feet per acre, an annual requirement of 979 acre-feet for diversion.

The subtotal for Owl Creek Basin is 315 acres with an annual diversion requirement of 1,690 acre-feet. The subtotal for the nonproject lands under the unadjudicated but in-use status would be 7,850 acres with an annual diversion requirement of 42,570 acre-feet.

* * * * *

THE SPECIAL MASTER: In none of your calculations in this study, Mr. Stetson, did you make a determination or did you not, whether some of this land had ever passed from Indian status and trust status into non-Indian ownership and back in again, or your testimony has nothing to do with the legal status of the land; is that right?

A. That's correct.

THE SPECIAL MASTER: Thank you.

Q. (By Mr. Clear) You just gave us a subtotal on the non-adjudicated trust lands outside the project; is that right?

A. Yes.

Q. Outside the projects. Would you give us a total of the non-adjudicated trust lands inside the project and non-adjudicated trust lands outside the project.

A. The total unadjudicated in use?

Q. Right.

A. Combining the project land with the non-project lands, you have a total of 34,427 acres.

THE SPECIAL MASTER: 34,000 --

THE WITNESS: 34,427 acres with an annual diversion requirement of 222,915 acre-feet.

THE SPECIAL MASTER: Give me the caption of that again. That is the total --

THE WITNESS: That's the total requirements for the unadjudicated trust lands presently in use.

MR. CLEAR: Project and non-project.

THE SPECIAL MASTER: Project and non-project?

MR. CLEAR: Yes, sir.

THE SPECIAL MASTER: The unadjudicated trust lands presently in use, project and non-project?

THE WITNESS: Yes.

THE SPECIAL MASTER: 222,915?

THE WITNESS: Acre-feet per year, yes, sir.

MR. CLEAR: You want a glass of water?

THE SPECIAL MASTER: Let's take a break, it's been a good long session.

(Thereupon, a ten-minute recess (was taken.

THE SPECIAL MASTER: Mr. Clear.

MR. WHITE: Your Honor, before he continues, could I ask one question, that is, who is your next witness so we could get out experts lined up?

MR. CLEAR: Dr. Mesghinna is our next witness.

THE SPECIAL MASTER: Due back?

MR. CLEAR: On the --

THE SPECIAL MASTER: That's after the cross later today?

MR. CLEAR: He's flying in today, Your Honor. We

got caught a little short.

THE SPECIAL MASTER: I'm making a joke, I'm trying to be facetious in speeding things up. It would be Dr. Mesghinna, okay. After, can you tell us after him too or do you need to know?

MR. CLEAR: After it's Mr. Dornbusch giving the economics on these historic lands.

MR. ECHOHAWK: Mr. Dornbusch or Mr. Merchant,

MR. CLEAR: Either Mr. Dornbusch or Mr. Merchant. In other words, we're repeating the process with historic lands that we did with future lands.

THE SPECIAL MASTER: All right. You ready at the United States' table?

MR. ECHOHAWK: Mr. Rodgers isn't here yet.

THE SPECIAL MASTER: All right. We'll wait a half a minute or so.

(Brief pause.

THE SPECIAL MASTER: All right. Are we ready to resume?

Okay. Proceed, Mr. Clear.

Q. (By Mr. Clear) Mr. Stetson, let's now turn to Type VII lands. Could you define again what Type VIIlands are?

A. Type VIIlands are trust lands which have had a history of irrigation, but are idle at the present time, they are

idle lands.

Q. What sort of study did you undertake with respect to the Type VII lands?

A. We were furnished maps and aerial photos of the areas in which those lands are located. In addition to making the office studies on them we have visited them in the field by helicopter, and we have examined them on the topo maps and on the aerial photos. We have analyzed them from the standpoint of water requirements, we have analyzed them from the standpoint of what it would cost to put those lands into production again. And we have submitted our cost data to the economists who have advised us in -- with respect to the present value of returns versus present value of costs on those lands.

Q. When you say costs, what costs do you exactly mean?

A. These would be the costs to put the lands back into production. Some of the lands require very little investment, perhaps a turnout, perhaps some additional ditch or perhaps --

Q. When you're talking about putting the lands back into production, you're talking about irrigation facilities?

A. For irrigation purposes.

THE SPECIAL MASTER: Could that include flooding too for those lands that just used to be pasture?

THE WITNESS: It could, yes, sir.

THE SPECIAL MASTER: Simple little floods once or twice a year as compared to five or six acre-feet of duty?

THE WITNESS: Well, we develop costs on the assumption they would be fully irrigated, that's what our costs are based upon.

Q. (By Mr. Clear) What items did you look at specifically with respect to costs?

A. We looked at such items as the headworks, the diversion head works, canal extensions or canal enlargements, turnouts, head ditch on the farm if that was required. If it was a pumping-type diversion, what type of pump, horsepower, what it would cost, the annual cost for all of these; maintenance, operation, energy and so forth.

Q. When you talk about -- Are you talking about the simple pump and pumping plant that Dr. Mesghinna testified to in the future lands? Is it the pumps to that extent?

A. Not the big pump stations, we're talking about relatively small pump stations for these lands because most of them are scattered and we're picking up a parcel here and a parcel there, so it's not a matter of pumping in a big pump station with several pumps. It's usually a

case of putting in one pump, perhaps two pumps to serve these lands.

Q. Are these costs, were they assessed on a total overall per-acre basis or were they assessed per individual parcel?

A. The costs were developed on a per-acre basis for each parcel.

Q. For each parcel?

A. Yes, sir.

Q. And then you turned those costs over to Mr. Dornbusch; is that right?

A. We gave him the results of our estimates of the construction costs and the annual costs from our standpoint.

They then analyzed those from an economic standpoint and from the approach of whether or not certain amendments were required on some of the soils and the usual analysis they go through. And advised them of what the present value of the returns would be with respect to the present value of the costs.

Q. As a result of their information, were any TypeVII lands, which Mr. Waples testified to, omitted from your eventual conclusions?

A. Yes, they were.

stetson - direct - clear

Q. How many acres was that, do you know, offhand, roughly?

A. Mr. Waples gave us figures for 10,440 acres of Type VII lands, and we had determined that 8,002 are irrigable as opposed to arable.

Q. Now, Mr. Stetson, are Type VII lands found in both the project areas and outside the project areas?

A. Yes, they are.

Q. In determining the water duty for the project areas, did you use the same method as determining the water duty for the project areas of adjudicated lands and non-adjudicated lands in each?

A. For the Type VII lands within the project areas?

Q. Yes.

A. Yes, we did.

Q. And similarly with the Type VII lands outside the project, did you use the same method that you used with the adjudicated and non-adjudicated lands in use outside the project?

A. Yes, we did.

Q. Could you give us the totals of the remaining acres and their water duty starting first with the project lands, please, the Type VII.

A. The Type VII irrigable lands in the Ray Unit there were 1,775 acres, a duty of 5.32 acre-feet per acre, annual

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diversion requirement of 9,443 acre-feet.

A. In the Coolidge Unit there was 1,161 acres of Type VII lands that qualified with a duty of 4.95 acre-feet per acre, an annual requirement of 5,747 acre-feet. In the Subagency Unit there were 200 acres with a duty of 5.26 acre-feet per acre and an annual diversion requirement of 1,052 acre-feet. In the Upper Wind Unit there were 99 acres in the Wind River A Canal service area where the duty is 12.06 acre-feet per acre, which would result in a requirement of 1,194 acre-feet per year. In the Dinwoody bench area there were 393 acres with a duty of 12.06 acre-feet per acre, an annual requirement of 4,738 acre-feet. In the Johnstown Unit there were 189 acres with a duty of 6.94 acre-feet per acre and an annual requirement of 1,312 acre-feet. In the Left-hand Unit there were 587 acres with a duty of 6.9 acre-feet per acre, annual requirement of 4,050 acre-feet. There were no Type VII lands in the Midvale Irrigation District. There was 100 acres in the LeClair Irrigation District with a duty of 5.48 acre-feet per acre or an annual requirement of 548 acre-feet. So the total in the project areas would be 4,504 acres with an annual diversion requirement of 29,084 acre-feet.

stetson - direct - clear

Q. All right, can you now give us your water duties for the Type VII irrigable lands outside the project?

A. Okay, starting with the Wind River Basin: East Fork Wind River there were 41 acres with a duty of 5.06 acre-feet per acre, annual requirement of 207 acre-feet. Dinwoody Creek, 27 acres, the duty is 5.57 acre-feet per acre with an annual requirement of 150 acre-feet. Sand Draw, 26 acres, duty of 5.06 acre-feet per acre, an annual requirement of 132 acre-feet. Dry Creek, 4 acres, duty of 5.57 acre-feet per acre, an annual requirement of 22 acre-feet. Bull Lake Creek, 37 acres, a duty of 5.37 acre-feet per acre, and an annual requirement of 199 acre-feet. Meadow Creek, 159 acres, duty of 5.09 acre-feet per acre, an annual requirement of 809 acre-feet. Dry (Pasup) Creek, 185 acres, duty of 5.06 acre-feet per acre, 936 acre-feet of annual requirement. Crow Creek, 159 acres, a duty of 5.29 acre-feet per acre, an annual requirement of 841 acre-feet. Wind River Main Stem, 213 acres, a duty of 5.51 acre-feet per acre, an annual requirement of 1,174 acre-feet. The subtotal for the Wind River Basin would be 851 acres with an annual requirement for diversion of 4,470 acre-feet.

For the total Little Wind River we have the North Fork Little Wind, 345 acres, a duty of 5.03 acre-feet per acre, annual requirement of 1,735 acre-feet. South Fork Little Wind, 44 acres, a duty of 5.09 acre-feet per acre, an annual diversion requirement of 224 acre-feet. Main Stem Little Wind, 805 acres, an annual duty of 5.94 acre-feet per acre, an annual diversion requirement of 4,782 acre-feet. Mill Creek, 10 acres, duty of 5.57 acre-feet per acre; annual requirement, 56 acre-feet. Sage Creek, 822 acres, duty of 5.57 acre-feet per acre, an annual requirement of 4,579 acre-feet. Crooked Creek, 3 acres, 5.57 acre-feet per acre duty, and an annual requirement of 17 acre-feet. Trout Creek, 86 acres, a duty of 5.11 acre-feet per acre, an annual requirement of 439 acre-feet. The subtotal for the Little Wind River Basin would be 2,115 acres and an annual diversion requirement of 11,832 acre-feet.

For the Big Horn Basin we have for the Main Stem Big Horn, 24 acres, a duty of 5.94 acre-feet per acre, an annual diversion requirement of 143 acre-feet. Cottonwood Creek, 117 acres, a duty of 5.89 acre-feet per acre and an annual requirement of 689

acre-feet. Muddy Creek, 186 acres, a duty of 5.63 acre-feet per acre, an annual requirement of 1,047 acre-feet. The subtotal for Big Horn River Basin would be 327 acres with an annual diversion requirement of 1,879 acre-feet.

For the Popo Agie we have 14 acre-feet on the North Fork --

THE SPECIAL MASTER: How many on the North Fork?

THE WITNESS: Fourteen acre-feet.

THE SPECIAL MASTER: Thank you.

A. With a duty of --

Q. (By Mr. Clear) Fourteen acre-feet or 14 acres?

A. I'm sorry, 14 acres. With a duty of 5.4 acre-feet per acre, an annual diversion requirement of 76 acre-feet. And that is also the subtotal for Popo Agie. There's nothing on the Main Stem.

Then we have the last one is the Owl Creek Basin. On South Fork Owl Creek there's 64 acres with a duty of 5.57 acre-feet per acre, an annual requirement of 356 acre-feet. Main Stem Owl Creek, 87 acres, a duty of 5.37 acre-feet per acre, an annual requirement of 467 acre-feet. On Mud Creek we have 40 acres with a duty of 5.37 acre-feet per acre, an annual

diversion requirement of 251 acre-feet for a subtotal for Owl Creek of 191 acres and a diversion requirement of 1,038 acre-feet.

So the nonproject subtotal would be -- these are Type VII lands in the nonproject areas, 3,498 acres with a diversion requirement of 19,296 acre-feet.

Q. Do you have a total for the project and nonproject Type VII lands?

A. Yes, that total for the project and nonproject Type VII lands would be 8,002 acres with an annual diversion requirement of 48,380 feet.

Q. Mr. Stetson, do you have a total overall figure for the acreage adjudicated and nonadjudicated Type VII inside the project, outside the project, do you have the total number of acres and total water duty?

THE SPECIAL MASTER: For the entire Wind River Indian Reservation?

MR. CLEAR: For the historic lands other than Type VII, all totaled, all these sums he's testified together.

MR. WHITE: Objection, Your Honor. There's no foundation again. There's no evidence that the adjudicated lands which he's talking about are, in

fact, trust lands.

THE SPECIAL MASTER: That may be true, but I'm going to overrule it only because if it is true, it will subtract certainly. For the purpose of moving along, I'll overrule it.

I'm still not too clear about the question though.

MR. CLEAR: Well, I'm just asking him to --

THE SPECIAL MASTER: To total what he's been testifying to?

MR. CLEAR: Right. Yes, sir.

THE SPECIAL MASTER: Is that about it?

MR. CLEAR: Yes, Your Honor, exactly.

A. The total would be comprised of all of the project lands and nonproject lands and the classification of adjudicated trust lands, unadjudicated trust lands now in use and the Type VII idle lands. That total would be 59,840 acres with an annual diversion requirement of 368,699 acre-feet.

THE SPECIAL MASTER: Let me ask a question or to to keep myself clear as we move along.

So if that 368,699 acre-feet you've just mentioned, 222,000 of it is used by the unadjudicated trust lands presently in use, project and nonproject?

THE WITNESS: That's correct, 222,915 acre-feet.

THE SPECIAL MASTER: So the difference is about 140,000 acre-feet, give or take some?

THE WITNESS: One hundred and forty-five thousand, something like that.

THE SPECIAL MASTER: And that you find is your evidence regarding the Type VII lands, both project and nonproject?

THE WITNESS: And the adjudicated lands.

THE SPECIAL MASTER: And the adjudicated lands presently in use?

THE WITNESS: Well, the adjudicated lands.

THE SPECIAL MASTER: Are lands on which there are certificates.

THE WITNESS: There are -- the category we've been given is the adjudicated lands within the project and outside the project, the total of 17,411 acres.

THE SPECIAL MASTER: Just hold it there a half a minute.

THE WITNESS: What I'm saying is that these are the water requirements for those adjudicated lands.

THE SPECIAL MASTER: Those are the total of all project and nonproject adjudicated and unadjudicated

and Type VII, the 368,699?

THE WITNESS: That's right.

THE SPECIAL MASTER: Okay, thank you.

MR. CLEAR: Your Honor, we do have tables which set this out and there's more information on those tables than he's testified to, and we can submit these tables and the information he's not testified to, just what he's testified to, if you want.

THE SPECIAL MASTER: Okay. Thank you.

MR. CLEAR: I have no further questions, Your Honor.

THE SPECIAL MASTER: Do the Indians wish to continue with direct?

MR. ROGERS: The Tribes have no cross.

THE SPECIAL MASTER: The Tribes? Any other United States counsel?

MR. ECHOHAWK: No.

THE SPECIAL MASTER: Okay. The State may cross-examine unless you want a little break now.

MR. WHITE: I'm going to ask for a break a little later on. We might as well go ahead now.

THE SPECIAL MASTER: All right.

CROSS-EXAMINATION

BY MR. WHITE:

Q Mr. Stetson, why did you develop separate cropping patterns for each climatic zone for the historic lands and yet your firm through Dr. Mesghinna for the future lands developed only two cropping patterns above and below 5900 feet?

A. For the historic lands the cropping patterns were established more on the basis of what was grown historically; for the future lands Dr. Mesghinna, along with people from the -- the economists from Dornbusch, established what they call a future cropping pattern. A cropping pattern, for example, that might bring higher returns.

Q. So it's possible then that you would have a historic parcel next to a future parcel for which you had developed cropping patterns?

A. It's possible.

Q Do you know where, if at all, that possibility turned into an actuality and actually existed?

A. I don't know offhand. Ours is the -- and, in fact, both of these cropping patterns are general cropping patterns for a large area. It doesn't mean that a specific crop is going to be grown on a specific

acre.

Q. Mr. Stetson, what was the cropping pattern which you developed for the Diversion Dam climatic zone?

A. For Diversion Dam? It was 40 percent alfalfa, 5 percent corn, 5 percent beans, 15 percent small grains and 35 percent pasture.

Q. Was Diversion Dam climatic zone above or below 5900 feet? Or do you know?

A. I would have to look at the map.

Q. What was the cropping pattern which you developed for the Fort Washakie climatic zone?

A. It was 40 percent alfalfa, 5 percent corn, no beans, 20 percent small grains, and 35 percent pasture.

Q. Do you know whether the Fort Washakie climatic zone is above or below 5900 feet?

A. I would have to look at the map.

* * * * *

Q. (By Mr. White) What was the cropping pattern which you developed for the Riverton climatic zone?

A. Riverton is the same as for Diversion Dam. Generally, Diversion Dam, Fort Washakie, and as well as Pavillion and Lander are at the lower elevations. Whether all of those are below 5900 feet, I'd have to look at the map.

Q. What was the cropping pattern which you developed for the Pavillion climatic zone?

A. That was the same as for Riverton.

Q. For the Lander climatic zone?

A. Lander was the same as for Fort Washakie.

Q. For the Burris climatic zone?

A. Burris is the upper area and that would be forty-five percent alfalfa, five percent small grain and fifty percent pasture.

Q. And for the Dubois climatic zone?

A. Dubois would be the same as Burris.

Q. Would you describe with specificity how you establish a cropping pattern for Diversion Dam climatic zone of forty percent alfalfa, five percent corn, five percent bean, fifteen percent small grains and thirty-five percent pasture?

A. We derived that from the crop data available for the two

units, Fremont and Hot Springs, and for the BIA projects, and for the Midvale Irrigation District. We reviewed those where data were available for crops in those areas, and then applied our judgment for what we would call a historic crop pattern.

Q. What crop pattern did you find for Fremont County?

A. I'd have to dig it out.

(Brief pause.

A. Spring wheat, seven-tenths of a percent; barley, fifteen percent; oats, 3.3 percent; dry beans, 2 percent; corn, 2.8 percent; all hay, 76.2 percent.

Q. Would you run through those slowly again? Spring wheat is .7 percent, but you lost me after that.

A. Barley, 15; oats, 3,3; dry beans, 2; corn, 2.8; all hay, 76.2.

Q. By "all hay", do you include alfalfa and grass hays?

A. Alfalfa and pasture.

Q. And what was the cropping pattern which you established for the Hot Springs County?

A. These are summaries of what their data indicated for the period 1975 to 1978.

THE SPECIAL MASTER: For Fremont or for Hot Springs?

THE WITNESS: The one I just gave him was for Fremont.

Hot Springs, spring wheat was five-tenths of a percent; barley, 10.3; oats, 4.5; dry beans, zero; corn, zero; all hay, 84 percent. And they had a category of other, of seven-tenths percent.

Q. (By Mr. White) And from what source were those cropping patterns by county developed?

A. From the Wyoming agricultural statistics for 1978.

Q. For Diversion Dam you show or you indicated that your cropping pattern, which you used, was 40 percent alfalfa and 35 percent pasture for a total of 75 percent of all hay; is that correct?

A. That's right.

Q. How did you derive the 75 percent all hay from the values which you gave for Fremont County, 76.2 percent and 84 percent for Hot Springs County?

A. Well, we apply it by judgment because we also had some data for Midvale Irrigation District, and Wind River Indian projects.

Q. What data did you have for Midvale Irrigation District?

A. We had data from Midvale which is indicated to be 1976, 1977, was 21 percent barley, 5 percent oats, 2 percent dry beans, 2 and a half percent corn, 62 and a half percent all hay, seven percent silage.

THE SPECIAL MASTER: Is silage corn aftermath?

THE WITNESS: Yes.

Q. (By Mr. White) Was that within -- Were those values for an area within the Diversion Dam climatic zone?

A. Again, I'd have to look at the climatic zone map. Is it an exhibit, I think it is?

MR. WHITE: I don't have it. Leo, do you have it?

THE SPECIAL MASTER: It's already -- I think it's in the record half a dozen times unless it would be a matter of testing credibility.

THE WITNESS: Would be at least partially in it.

Q. (By Mr. White) Do you know whether or not the cropping pattern that you've just described for Midvale was for the lands within Diversion Dam or all of the lands within the district?

A. The cropping pattern I described would be for all the lands within the district.

Q. Okay. Did you develop any other data upon which you relied in establishing your cropping pattern for Diversion Dam?

A. We have a third source, the Wind River Indian project, from 1975 to 1977. We have an allocation.

Q. Would you give me that, please.

A. Spring wheat, one-tenth; barley 20 percent; oats, four; dry beans, 1.5; corn, 2; all hay, 66; silage,

Other, 1.4.

Q. I'm sorry, what was your all hay value again, please?

A. Sixty-six.

Q. And your "other"?

A. Silage.

Q. I'm sorry, silage.

A. Five. Other was 1.4.

Q. Did your values for the Wind River Indian project include cropping pattern for -- actual cropping pattern for lands outside the Diversion Dam climatic zone?

A. Oh, yes, I'm sure they would.

Q. How did you analyze the Midvale and the Wind River Indian project cropping patterns so as to arrive in conjunction with the Fremont County and Hot Springs County cropping patterns and the cropping pattern which you developed for Diversion Dam climatic zone?

A. We took -- By reviewing the data from all three of those sources, we then estimated a cropping pattern and we adjusted the cropping pattern for the different climatic stations based upon climatic conditions. That's why we have no corn and no beans in the upper area, we have corn in the lower area, but not in all of the lower area.

We took it out of Fort Washakie and Lander because

both of those zones have some areas that are a little colder.

Q. Based on the data which you've described, would you please explain, specifically, how you came up with 40 percent alfalfa in the Diversion Dam climatic zone?

A. Well, because 40 percent plus 35 pasture is 75 percent hay crops.

Q. Um-hum.

A. That was our judgment that that would be a reasonable crop pattern for the historic use of the lands. Small grains, we have it 15 percent, and then we split the corn and beans. We did not want to get down to details of tenths of percents or even to the nearest one percent. We kept them to the nearest five percent generally.

Q. Let me ask you, how did you break your all-hay value of the 75 percent into 40 percent alfalfa and 35 percent pasture?

A. Solely by judgment.

Q. And how did you determine that instead of using 76 percent or 84 percent was the all-hay value for Fremont and Hot Springs County, that the value should be 75 percent for diversion?

A. Solely by our judgment based on the data available to us.

Q. Did you use any other data other than that which you've already described?

A. No.

Q. What inspections on the ground, if any, did you make to verify the cropping pattern which you had established for the seven climatic zones?

A. Just our familiarity with the reservation during the two or three years we've been studying it. We did not go out and inventory the crops.

We also keep in mind we're using this to derive a unit value of corn consumptive use and alfalfa and pasture have a very similar unit value of consumptive use.

(Brief pause.

Q. Mr. Stetson, you testified that there were 347 acres of adjudicated trust lands within the Ray Unit; is that correct?

A. Yes.

Q. What were the permit numbers for those adjudicated certificates?

A. Permit numbers?

Q. Yes.

A. I'm not sure I know, but I'll take a look.

(Brief pause.

THE SPECIAL MASTER: Three hundred and forty-seven acres of adjudicated?

MR. WHITE: Yes, sir, I'm asking him --

THE SPECIAL MASTER: The certificate number?

MR. WHITE: What certificates go into the 347.

(Brief pause.

THE WITNESS: I have an indication here in some backup data supplied by HKM Associates that give permit numbers 6633-9080.

Q. (By Mr. White) 6633-9080?

A. That's what it says in this backup data. I know nothing about it, about this permit.

Q. Okay. Keep going, please.

THE SPECIAL MASTER: Do you want the one on Coolidge?

Q. (By Mr. White) That is the only one, only one certificate for the 347 acres?

A. Well, there is a list of proof numbers, different proof numbers.

Q. Individual proofs within that series of permit number series?

A. Apparently.

Q. Could you give me those, please.

Well, we might make it easier, you're looking at

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some sort of a document, are you not?

A. I'm looking at a document, yes, sir.

Q. May I see it, please?

A. Yes, sir.

THE SPECIAL MASTER: Mr. White, are these numbers on a State exhibit that we had introduced during the boundaries and dates portion of the lawsuit?

MR. WHITE: I don't know.

THE SPECIAL MASTER: With the little rectangular squares and proof numbers all the way up the river?

MR. WHITE: I don't know, and the reason I don't know is we were given tables summarizing Mr. Stetson's testimony, and only in the details to which he testified, yesterday afternoon, and we have no way of knowing what certificate numbers are included within those values or whether those certificates are the ones we talked about during the boundary trial.

THE SPECIAL MASTER: That are in evidence, all right.

(Brief pause.

MR. WHITE: Your Honor, this might be an appropriate time to take a recess.

THE SPECIAL MASTER: All right.

MR. WHITE: Since we have not yet had a chance to analyze this.

THE SPECIAL MASTER: All right, we'll take a ten-minute break.

(Recess, 11:11 a.m. to 11:31 a.m.

THE SPECIAL MASTER: We will please come to order.

Q (By Mr. White) Mr. Stetson, I return to you a document which you provided to me and ask you if you would examine what has been marked for identification as HS-1, which is a photostatic copy of that document?

THE SPECIAL MASTER: HS?

MR. WHITE: HS for Historic Stetson, Your Honor.

THE SPECIAL MASTER: I wanted to get that right.

MR. WHITE: I'd better get that in the record fast.

THE SPECIAL MASTER: HS-1. Just because we're historic, they put the word "historic" before a name. How about that?

THE WITNESS: That's the way I took that, but I'll get even with him.

MR. WHITE: He has all sorts of ways not available to me to get even, Your Honor.

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Q (By Mr. White) I think that you will find, Mr. Stetson, that there are penciled page numbers in the upper right-hand corner, for ease of reference, which do not appear in the original.

A. Right. This appears to be a photostatic copy of the document that you borrowed.

Q. Would you please describe again for the benefit of the record what HS-1 is?

A. HS-1 is the adjudicated lands which it is entitled "Adjudicated Lands by Location" on the first typewritten page and by location on that page they apparently mean by river system and subsystem. And then following that are aerial photographs, views, and adjudicates acreage per aerial photograph. Again, the typewritten page -- two pages. The total acreages on that two-page tabulation matches the total acreage on the two-page tabulation which indicated it was located by location. And then attached to those four pages is a form which has been filled out by hand, adjudicated acreage claim, and there is a separate sheet or so for each of the river system location areas.

Q. Did you rely on the facts and data contained within HS-1 in arriving at your conclusions?

A. Insofar as the acreages concerned, yes, sir.

Q. Okay.

A. For adjudicated acreage.

Q I see on page --

A. On its location. I'm sorry.

Q. Okay. Anything else?

And you used only the trust acreage that's shown on 5 and 6, is that correct? Not the fee acreage that's shown there?

A Yes, sir. We used only the trust acreage.

Q Where did you get these facts and data, were they provided to you by HKM?

A They were provided to us by HKM Associates.

Q Is it true then that you have no personal knowledge that on page 5, for example, Permit Number 8913 contains a total of 110 acres?

A I have no personal knowledge other than what is set forth on this page.

Q And is it true that you have no personal knowledge of the allocation of that 110 acres, 10 acres to fee and 100 acres to trust?

A That's correct.

Q You were talking about Permit Number 633-9080 with respect to the Ray Unit -- or the Ray Unit's 347 acres. Could you indicate the page number upon which that appears?

A That appears on page 30.

* * * * *

Q (By Mr. White) On page 30, isn't true that the 347 acres is found in six different parcels?
A Yes.
Q And the first parcel contains ten acres?
A Of trust land --
Q Yes.
A Yes, sir.
Q How did you determine for the ten acres or for that ten acres plus the other five parcels, that there was an annual diversion requirement of 5.32 acre feet per acre?
A Well, from these data, we went to the photo number and the maps and looked at the location of the lands with respect to the climatic zones, and totaled up the acreage within each climatic zone within each stream system or subarea. And from that we derived the unit net irrigation requirement if it was non-project. And using the efficiency, determined the diversion requirement.
Q Okay. Could you lead us through the calculations which you made with respect to that ten acre parcel?

(Brief pause.

A That ten acre parcel would combine with 7.9 acres. We have the 17.9 acres subtotal for that unit which we rounded to 18 acres, which appears on

photo 13-104, and it's in the Fort Washakie climatic zone. And we applied a unit net irrigation requirement of 1.73 acre-feet per acre in that zone.

Then we determined the total net irrigation requirement for the year for that parcel and went down through that.

Q So you multiplied 1.73 times 18 to get your total irrigation requirement?

A No, that was the total net irrigation requirement.

Q Okay.

A We did this for each parcel of adjudicated land in the Ray Canal area.

Q Are you referring to a tabular presentation of those calculations?

A Yes.

Q May I see it, please?

THE SPECIAL MASTER: Is it part of the report that is intended to be offered into evidence?

MR. CLEAR: Your Honor, what we intend to do, as I said, Mr. Stetson's prepared a report, but he only testified today as to the -- those various tables, and we intend to, at lunch time --

THE SPECIAL MASTER: Is the report he now has on his table to which he just had in his hand

and is about to hand to Mr. White, a part of the same report you're alluding to?

MR. CLEAR: I don't know.

THE SPECIAL MASTER: Would you find out, Mr. Clear, please. I just want to avoid any duplication down the road, copying and --

MR. CLEAR: Yes, Your Honor.

THE SPECIAL MASTER: It is, thank you. Go ahead, Mr. White.

Q (By Mr. White) The document which you were about to hand me, that document which Mr. Clear has just examined, doesn't show, does it, the calculations which you made with respect to the 17.9 acres?

A It doesn't show that calculation.

Q But you have worksheets by your left elbow that do, do you not?

A That's correct.

Q May I see those?

A Oh, those are the ones you want.

This is a set of 14 sheets of --

MR. WHITE: Your Honor, could I just look over his shoulder while he describes it? It might save a little time.

THE SPECIAL MASTER: If the witness doesn't mind.

THE WITNESS: I don't mind, no.

THE SPECIAL MASTER: All right.

THE WITNESS: So long as he doesn't call me historic.

This is a series of 14 worksheets. Its Drainage Unit Water Requirements is the main heading, and we have column headings for photo number, climatic zone, adjudicated trust, unadjudicated trust in use, total acres.

Then we have some additional headings, net irrigation requirement with unadjudicated, we have unit requirement and we have an acre-feet per year requirement. And the same two headings under unadjudicated. This set of sheets lists the acreage by aerial photograph, the drainage area it's in, the subdivision of that, the number of acres adjudicated or unadjudicated, and the total acres, and then the extensions of the unit consumptive use and the annual consumptive use.

(Brief pause.

Q (By Mr. White) Mr. Stetson, have you prepared similar tabular representations of your calculations for the Type VII lands?

A They're not in the exact same form, as I recall.

Q What form do you have them in?

A We have them on a -- As far as the water requirements, I'd have to -- Maybe I could look at them during the noon break and get those. They're not in the same form as those. We may have put those together just by making the calculations off the map, and I have to check that out.

They are not -- That's why they're not included with that group there.

MR. WHITE: Your Honor, I would suggest at this time that we take our lunch break, and the reason I'd say that is as the Court is probably aware, there's been no discovery with respect to this particular area of evidence since the time that any finalized data is available.

THE SPECIAL MASTER: I'm not aware of that, and I don't want to be aware of it.

MR. WHITE: I thought you'd probably figure it out when I was getting all this.

THE SPECIAL MASTER: You had two depositions taken, I believe, and I'm hopeful that you can, you know, get at what you wish by examination of his workpapers, which you have a right to do, of course.

MR. WHITE: If we could take a break --

THE SPECIAL MASTER: Yeah, this is a good time to take a break and find what he's referring to.

MR. WHITE: We could probably get some of this information.

THE SPECIAL MASTER: We will resume at 1:30.

(Thereupon a lunch recess was
(taken at 11:50 a.m.

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