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File 154
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case # 4993

File # 154

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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 WYO-)
MING.)

Civil No. 4993

FILED _____
5/1 1981
Margaret J. Hampton CLERK
DEPUTY

VOLUME 47

Friday, April 24, 1981

ORIGINAL

APPEARANCES

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FOR THE STATE OF
WYOMING:

HALL & EVANS
2900 Energy Center One Building
717 17th Street
Denver, CO 80202
BY: MR. MICHAEL D. WHITE, Special
Assistant Attorney General
and
MR. STUART RIFKIN and
MR. SCOTT KROB

FOR THE UNITED STATES
OF AMERICA:

MR. THOMAS ECHOHAWK
Attorney at Law
Land and Natural Resources
Division
Department of Justice
1961 Stout Street
Denver, CO 80294

and

MR. JAMES CLEAR and
MR. JOSEPH MEMBRINO
Attorneys at Law
Land and Natural Resources
Division
Department of Justice
Washington, DC 20006

FOR THE SHOSHONE
TRIBE:

SONOSKY, CHAMBERS & SACHSE
200 M. Street, N.W.
Washington, DC 20006
BY: MR. HARRY SACHSE

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1 THE SPECIAL MASTER: Please come to order.

2 MR. ECHOHAWK: Your Honor, before we
3 resume the direct examination of Dr. Mesghinna, the
4 United States has several matters we would like to
5 bring up. The first item would be to inform the
6 State of Wyoming of a slight change in our witness
7 order. The subject matter will be the same. We
8 had informed them earlier Dr. Mesghinna would return
9 to the stand and discuss in full engineering regarding
10 historic lands. We changed, and we will call Tom
11 Stetson of Stetson Engineers to discuss the historic
12 lands.

13 THE SPECIAL MASTER: Do you want to
14 anticipate or project a probable date for that, or
15 are you just going to --

16 MR. ECHOHAWK: He's going to follow Dr.
17 Mesghinna whenever he finishes, then the economist,
18 Mr. Dornbusch, to discuss the economics.

19 THE SPECIAL MASTER: Before or after
20 Stetson?

21 MR. ECHOHAWK: Before Dornbusch to discuss
22 economics, and following him will be Mr. Stetson.

23 The other matter, Your Honor, would be
24 the question of the computer listing that was requested
25 earlier from Mr. Toedter. This, too, is a matter of

1 utmost importance to the United States and to its
2 consultants that we have hired, and we would like
3 to possibly set that for argument sometime during
4 the next session.

5 MR. WHITE: What's there to set for
6 argument, Your Honor? You already ordered it.

7 MR. ECHOHAWK: I don't think there was an
8 order. I think we were to take it under advisement
9 and discuss that matter, and I think that we have
10 discussed that with the parties involved and we
11 would also like to reesearch the matter a bit and
12 possibly set that down for discussion sometime during
13 the next session.

14 THE SPECIAL MASTER: Is it possible after
15 you research you may conclude it's inappropriate
16 that you produce him?

17 MR. ECHOHAWK: That's right, Your Honor,
18 with certain limitations.

19 MR. WHITE: I don't think that's being
20 quite candid with the Court. We have been advised
21 by the United States they will not produce him under
22 any circumstances. If that's the case, I think he
23 then ought to tell the Court then we could go ahead
24 and argue about it.

25 MR. ECHOHAWK: I don't think that's quite

1 right:

2 MR. WHITE: I'm sort of ashamed to use
3 the language to place in the interchange, Your
4 Honor, but --

5 THE SPECIAL MASTER: Here we are again.
6 Let's set it down for one of those matters that we
7 will take up before the regular evidence of the
8 next session, which will be ten days from now.

9 MR. ECHOHAWK: We set that also for the
10 same Thursday that we have the argument set on that
11 request to produce the Crow.

12 THE SPECIAL MASTER: We will, but you know
13 how strong I feel about that. I'll set it for
14 hearing and keep an open mind, but you know how I
15 feel about that. Give me again what --

16 MR. CLEAR: It's not a computer printout,
17 Your Honor.

18 MR. ECHOHAWK: What they're asking for is
19 the computer program. They're not asking for the
20 information generated, they're asking for the
21 program, and within that as much, much time; much,
22 much money, and many, many of the companies own
23 hardware, but the secrets they don't want divulge
24 that to other companies to be used in other situations.

25 MR. WHITE: Let me explain what is involved,

1 Your Honor. What's involved, the United States'
2 expert has a bunch of data, he dumped it into the
3 computer, and out comes some results. What they
4 are saying by that is we can't have a program and
5 we cannot know exactly what the computer does to the
6 data they feed in to get the results that come out.
7 In other words, the computer has to be accepted
8 as a little black box, opaque, accepted at face
9 value, and what we're asking for is a program listing,
10 the program listing that tells you what happens to
11 the data when it goes into the computer before it --

12 THE SPECIAL MASTER: You have a right to
13 the software. You have a right to information going
14 in the computer in the United States' case in this
15 matter; what the United States seeks to determine,
16 in feeding this material into the computer. It's
17 not your business after that. Now, you have a right
18 to what's feed into the computer, what the United
19 States is working with in getting their material.
20 That is what you have a right to.

21 MR. WHITE: Are you saying -- I'm sorry,
22 go ahead.

23 THE SPECIAL MASTER: I believe -- well,
24 let's set the thing down for hearing and see what
25 it is and be specific in your argument, and maybe I

1 can do some research and find what my proper order is.

2 MR. WHITE: We would like to find out what
3 the rule is because I think the legal maximum is
4 what's sauce for the goose is sauce for the gander.

5 MR. ECHOHAWK: Your Honor, we have much
6 more to lose on that than the State of Wyoming does.

7 MR. WHITE: The United States doesn't know
8 that yet.

9 THE SPECIAL MASTER: It will be argued, and
10 I would like citations from both of you and a little
11 bit of guidance from you on this new and novel point
12 as far as I'm concerned so I can have those things
13 to go by on it.

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1 MR. ECHOHAWK: The next matter we bring up,
2 Your Honor, is that during the deposition of Mr. Toedter,
3 the State of Wyoming requested certain information
4 orally. I asked Mr. White to reduce that to writing,
5 which I believe is required in the rules.

6 THE SPECIAL MASTER: Was that in the last few
7 days before Mr. Toedter left?

8 MR. ECHOHAWK: Yes.

9 MR. WHITE: Your Honor, the information which
10 was requested deals with a systems analysis which HKM is
11 doing. The systems analysis is for the purpose of find-
12 out whether there is enough water in the river to satisfy
13 all the claims of the United States.

14 We asked Mr. Billstein about that last month during
15 his deposition --

16 THE SPECIAL MASTER: If there is enough water
17 in the system for what?

18 MR. WHITE: Enough to supply the -- to provide
19 the water being claimed by the United States.

20 We asked Mr. Billstein about that, and he said no
21 decision has been made to go ahead during his deposition
22 last month.

23 Two weeks ago Mr. Echohawk endorsed Mr. Billstein
24 and a witness to talk about the systems study. In other
25 words, is there enough water to meet the claims.

1 During Mr. Toedter's deposition, he had done some work
2 on the systems analysis study, and he described in general
3 what has been going on in the study.

4 THE SPECIAL MASTER: In his deposition?

5 MR. WHITE: In his deposition. He had material
6 with him, and I asked him for the specific facts and data
7 which they used. Counsel for the United States would not
8 let him divulge them.

9 The reason was Mr. Clear said, "Look, I've got to
10 talk with Mr. Echohawk--" that was last Friday -- "and
11 see whether or not it's okay for us to deliver them to
12 you."

13 Yesterday I was told, "No, you can't have them."
14 And now, this morning, if I would put the request in
15 writing, they'll think about it.

16 It's set out specifically in the transcript, and
17 I would like the Court to take a look at the transcript.
18 I set it out there and there is no doubt.

19 Mr. Echohawk said, "We may have already given you
20 some of the stuff." Fine, tell me, you gave it to me,
21 but I still want to have the facts and data analyses
22 used --

23 MR. ECHOHAWK: Your Honor, we're entitled to
24 30 days to respond --

25 THE SPECIAL MASTER: Well, let's get it in

1 writing and treat it in writing and see what we can't do.
2 It's going to come out in this trial one way or another;
3 either you'll get it or I will.

4 We're going to be inquiring into every question
5 regarding water in the system which is pertinent to ad-
6 judication of the rights to use this water. So let's get
7 it in writing.

8 MR. WHITE: Is that the general rule of dis-
9 covery, that it's got to be formally requested in writing?

10 THE SPECIAL MASTER: No, but I am trying to
11 limit the discovery. I understood there would be no more
12 depositions, but I see them still going on. I suppose
13 that's because you're agreeing on them. But it is not a
14 general rule that everything has to be in writing, no.
15 But let's get this one in writing. It might be more
16 efficiently handled.

17 Mr. Echohawk wants 30 days; he might come up with
18 more material himself.

19 It's not going to be denied in the record of this
20 proceeding.

21 MR. WHITE: The point is, Your Honor, I was
22 entitled to see the material that the witness was refer-
23 ring to --

24 MR. ECHOHAWK: You were entitled to the facts --

25 THE SPECIAL MASTER: What you're entitled to in

1 the deposition is not my concern. It's your concern.

2 MR. WHITE: Let me make my own motion, Your
3 Honor. Because the witness was not allowed, as I re-
4 quested, to provide me the information, I would now ask
5 the Court to compel production of that.

6 THE SPECIAL MASTER: The Court is saying to
7 put it in writing. Is that so unreasonable?

8 MR. WHITE: If that is the ruling of the Court,
9 we'll play the same game with the United States.

10 THE SPECIAL MASTER: That's all right. That's
11 all right. Let's put this particular matter in writing
12 and we'll be very happy to work with it.

13 MR. ECHOHAWK: The final matter is the question
14 of the scheduling once we resume in May. If, at all pos-
15 sible, we want to find out how long we are going to go
16 so we can make plans with our witnesses. If we could
17 have some certainty as to how many weeks we --

18 THE SPECIAL MASTER: I believe from the top of
19 my head, and I think I'm correct, that we're going to
20 resume on Tuesday, giving you Sunday and Monday off.
21 All right, we start after -- on Monday, May 4th, unless
22 sometime today Mr. White wants the 4th and 5th --

23 MR. WHITE: I waived that, Your Honor. I'll
24 be here the 4th.

25 THE SPECIAL MASTER: You'll be here? All

1 right, we'll start Monday, May the 4th, Mr. Echohawk.

2 MR. ECHOHAWK: How many weeks would we --

3 THE SPECIAL MASTER: I have no way of telling
4 that from the evidence. We are prepared to go --

5 MR. ECHOHAWK: The United States has about eight
6 or nine more witnesses --

7 THE SPECIAL MASTER: Let me say what we will
8 do. The full week, Monday, Tuesday, Wednesday, Thursday,
9 Friday, through the 8th of May. The first week is that,
10 right, Leo?

11 MR. SALAZAR: Yes.

12 THE SPECIAL MASTER: We will resume on Monday,
13 the 11th of May, and fill that full week. I wish I had
14 my calendar here.

15 MR. WHITE: Maybe we ought to defer this discus-
16 sion until after break, Your Honor.

17 THE SPECIAL MASTER: The third week, we will
18 begin on the 18th, Monday, again, 1981.

19 On May 4th, that meeting the first week of May will
20 be in the GSA Conference Room in the Federal Building.

21 MR. WHITE: Is there any way we could have that
22 at Room 302 in the Capitol? Is that booked?

23 THE SPECIAL MASTER: CPA is giving statewide
24 examinations that week, or something of that kind.

25 MR. WHITE: How about the House Chambers?

1 MR. SALAZAR: There's nothing available.

2 THE SPECIAL MASTER: There is one probability.

3 The GSA we know we will have on the 4th. If two trials
4 set for hearing in Judge Brimmer's court are settled,
5 then we are welcome to his courtroom all week, but if
6 not one of the case or neither is settled, then we will
7 have the GSA Conference Room as a fallback.

8 May 11th is Room 302 in the Capitol. The week of
9 May 18th will be here in the Supreme Court Chambers, and
10 that will be a full week, the 18th through the 22nd.

11 On the Fridays of each of those weeks, I am amenable
12 to adjourning at noon.

13 MR. WHITE: I have agreed to that for the bene-
14 fit of Washington counsel.

15 THE SPECIAL MASTER: On the week of the 25th,
16 I am not too sure all of you are going to be wanting
17 that full week. If you do, it is agreeable, but we will
18 adjourn at 2:00 on the 27th. We can come in an hour
19 earlier on the 27th and go straight through like we did
20 last Wednesday, from 8:00 in the morning.

21 MR. ECHOHAWK: I note that the 25th is Memorial
22 Day.

23 THE SPECIAL MASTER: That week is the week I
24 wondered if some of you wanted off because of Memorial
25 Day or the last of the month or the fact of three weeks

1 of straight hearings.

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1 MR. WHITE: I'm afraid if we start taking
2 chunks of time --

3 THE SPECIAL MASTER: We have heard you now
4 about four times tell us that, and we appreciate
5 your concern about speeding us along.

6 MR. WHITE: Well, you asked, Your Honor.

7 THE SPECIAL MASTER: I don't know how we can
8 say very certain now that we are going to have the
9 week of the 25th, and even if we do, I suppose if we
10 start the morning of the 26th in respect to the
11 holiday, Tuesday the 26th --

12 MR. SACHSE: Your Honor --

13 THE SPECIAL MASTER: Yes?

14 MR. SACHSE: I think if we set three full
15 weeks in May, that's going to be plenty.

16 THE SPECIAL MASTER: My head tells me so,
17 my mind tells me so, but again, I'm not going to --

18 MR. ECHOHAWK: Again, if we set it for
19 the 26th, that would require travel on the holiday.

20 THE SPECIAL MASTER: It will require you
21 to get here on the Monday and go through Tuesday,
22 Wednesday, Thursday and Friday, four days of that
23 week. Now, if you are prepared and if Counsel for
24 the United States is in agreement, we'll go along with
25 the second or third week of May, but if you don't want

1 that last week we will scrub it, but as of now, it's
2 set for hearing and we will begin on Tuesday the 26th,
3 that last week, with an early break on the 27th and
4 through Friday again of that week.

5 MR. ECHOHAWK: Your Honor, could we just
6 set for that a week off? After three weeks of
7 trial and plus a holiday in that week, I would just
8 as soon take it off.

9 MR. WHITE: The State can't agree to that,
10 Your Honor.

11 THE SPECIAL MASTER: Well, I'm not much
12 concerned with the State agreeing with it or not.

13 MR. ECHOHAWK: It also sets a bit of
14 certainty into our schedule if we can have for sure
15 three weeks, then take off and begin again or
16 something.

17 MR. WHITE: All four of you think that you
18 would rather not have that week?

19 MR. SACHSE: I personally think three weeks
20 in a month of trial out here is plenty.

21 THE SPECIAL MASTER: The maximum?

22 MR. SACHSE: Because all of us have other
23 duties, too.

24 THE SPECIAL MASTER: You concur, Mr. Clear?

25 MR. CLEAR: Pardon?

1 THE SPECIAL MASTER: That is your feeling,
2 too?

3 MR. CLEAR: Yes, Your Honor. It's very
4 difficult. You have to get home once in awhile to
5 take care of matters at home.

6 THE SPECIAL MASTER: How about you, Mr.
7 Membrino?

8 MR. MEMBRINO: I agree.

9 THE SPECIAL MASTER: You, too, Mr. Echohawk?

10 MR. ECHOHAWK: Yes, Your Honor.

11 MR. SACHSE: In fact, I would like to see
12 if it's possible after these three weeks of trial to
13 have two weeks off and start the second week in
14 June instead of the first week in June.

15 THE SPECIAL MASTER: I'm not sure we can
16 go that far, but I do feel that striking the last
17 week in May is not all that much of a set back to
18 our progress, so I'm agreeable in doing that. We will
19 do it for now. The last week of May would then be
20 stricken for Memorial Day weekend and we will not
21 work. We will resume the week of June 1st, which is
22 a --

23 MR. ECHOHAWK: Your Honor, I have a note
24 that you have a conflict on Monday.

25 THE SPECIAL MASTER: Well, somebody has a

1 conflict. The first day I gave to somebody, I think
2 me.

3 MR. ECHOHAWK: I think it was you. If I
4 recall, we were in your office that one day --

5 THE SPECIAL MASTER: That's correct.
6 That's on the calendar. That's right. Then we
7 start Tuesday, June 2nd, and all starting days are
8 9:15 unless otherwise noted. We will start Tuesday,
9 June 2nd, and that will be in 302 of the Capitol,
10 The week of June the 8th we will begin -- the 8th
11 through the 12th, and that will be at 302 in the
12 Capitol. The week of June 15th will be through the
13 19th, and that will be at 302 in the Capitol.

14 MR. SACHSE: Mercy, that's enough.

15 THE SPECIAL MASTER: I know it's enough,
16 but we have one more week and we will throw it at
17 you.

18 MR. ECHOHAWK: We have three weeks in a
19 row there.

20 THE SPECIAL MASTER: I know. It will be
21 we have three weeks in a row, but you have a five-
22 week month in June. You know, it's unrealistic to
23 set that far ahead. We have already seen that in
24 this case. You set it up and then you have stipulations,
25 agreements, something falls out. We have seen that on

1 several instances. Why don't we wait until the
2 middle of June and see how we feel about that.

3 MR. ECHOHAWK: That's fine.

4 THE SPECIAL MASTER: Is that far enough
5 ahead?

6 MR. SACHSE: Yeah. I want to make a
7 statement about a conflict that I have in advance.
8 I'm going to have a trial on a preliminary injunction
9 in Up-State New York, northern district of New York,
10 in either the 2nd or 3rd -- excuse me, either the
11 third or fourth week of June. I think we may very
12 well be in a stage of this case by that time that
13 I'll feel it's necessary to attend. If I find that
14 that conflict does develop, I would like to be able
15 to ask you in early June to at least cut off about
16 three days of the week so I can make that.

17 THE SPECIAL MASTER: Do you know which
18 week it will be?

19 MR. SACHSE: I don't know yet, but I know
20 it will be one of the last two weeks in June unless
21 something unexpected happens. Ordinarily, you know,
22 I would say I have this case first so I can't set
23 the other case, but since this case is going on so
24 long, I've got to be able to set this other matter
25 for trail. Now, if it's something that's a part of

1 the case that Mr. Rogers has handled or I feel Mr.
2 Perry can do and it's not necessary for me to be
3 here, I'll inform the Court, but if it's a part
4 where it's a witness I plan to present, then I
5 would ask for some consideration on that.

6 THE SPECIAL MASTER: If you know what
7 specific dates those are and want to write up those
8 dates in the week of June 2nd, I'll let you do it.

9 MR. SACHSE: I'll know in exactly three
10 weeks the exact date in June. In other words, I'll
11 know in the middle of May the date in June.

12 THE SPECIAL MASTER: With these dates now
13 set, Mr. Echohawk, your remaining witnesses are Mr.
14 Dornbusch and Mr. Stetson after Dr. Mesghinna?

15 MR. ECHOHAWK: After Dr. Mesghinna we
16 have Mr. Dornbusch, Mr. Stetson, Mr. Dornbusch again
17 on historic economics, Mr. Vogel on the fish and
18 fish flows; Mr. Toedter again on the depletion
19 analysis; Mr. Keene on the virgin flow, natural flow
20 of the river; Mr. Billstein as to the systems
21 operation and possibly again Mr. Stetson.

22 THE SPECIAL MASTER: Do you really
23 believe those witnesses are going to take up a full
24 four more weeks of five days each?

25 MR. ECHOHAWK: Yes, Your Honor. There is

1 still some fairly complex matters to get into.

2 MR. WHITE: I have to agree with Mr.
3 Echohawk, Your Honor.

4 MR. ECHOHAWK: It will be quite awhile.
5 I think Mr. White and I reached a projection before
6 of possibly another 60 days of trial for the
7 Government's case.

8 THE SPECIAL MASTER: We are halfway through
9 into June. All right. Well, we can plan them the
10 last week or maybe a portion of the 4th and all of
11 the last week of June that we will be in session,
12 but that will bring us into a full July. You see,
13 the reason we ought to not be in session on Monday,
14 June 29th is because that's the Fourth of July
15 weekend so we know we are not going to work that
16 weekend. That will bring us back here July 6th or
17 7th, and we have put in a full four weeks -- full
18 three weeks of July until the 25th if Frontier Week
19 is not that week. If it is, we will skip it and
20 go --

21 MR. WHITE: Your Honor, we previously did
22 not have settings for July, and I have a setting for
23 the week of July 13th and the week of July 27th.

24 THE SPECIAL MASTER: One of those weeks we
25 won't be in anyway. The 27th or so we for one day

1 wouldn't be in session because of Frontier week.
2 If Frontier week runs the 20th to 25th, we won't
3 be in session then.

4 MR. WHITE: I need to advise the Court I
5 have pretrial conferences and week-long trials
6 scattered through August and September.

7 THE SPECIAL MASTER: August I planned no
8 hearings whatsoever, and that's for certain now,
9 so that will take care of that. That's agreed with
10 everyone, I'm sure. September we will pick when we
11 can as we can, but we don't have to set that now, do
12 we?

13 MR. WHITE: I would ask you to do me a
14 favor, Your Honor. I'm before another judge and
15 he says, "What's open on your calendar," and, well,
16 it's hard for me to say, "Well, we got this trial
17 going on, we don't know how long it will take." If
18 we could make some tentative settings so I could
19 hold time open.

20 THE SPECIAL MASTER: Let's try tentative
21 settings for September. now that we are all together
22 here. And in September, Labor Day, the first week
23 is the Labor Day weekend, the Labor Day week. Let's
24 resume after the July hearings on September the 7th.

25 MR. ECHOHAWK: September 7th is Labor Day.

1 MR. WHITE: I have a trial that week,
2 Your Honor.

3 THE SPECIAL MASTER: You have a trial
4 most all that week?

5 MR. WHITE: Well, it starts on Thursday.
6 If we're going to do it, try it --

7 THE SPECIAL MASTER: You need Monday,
8 Tuesday, Wednesday for preparation?

9 MR. WHITE: But I'm free the week of the
10 14th.

11 THE SPECIAL MASTER: Let's set September
12 the 14th as an assumption to the 18th. Let us set
13 the week of the 21st, that's through the 25th. That's
14 two weeks of September. All right. That takes you
15 to the end of the month for other things. Why are
16 we missing the third week? Well, the third week is
17 the 7th to 11th, and that's all right, and the week
18 before, that is Labor Day weekend.

19 MR. WHITE: I'm going to plead on bended
20 knee, Your Honor, for October. That's when I
21 always take my vacation and go elk hunting.

22 THE SPECIAL MASTER: How much time would
23 that be?

24 MR. WHITE: Well, I don't --

25 MR. CLEAR: It takes him a long time to find

1 the elk, Your Honor.

2 THE SPECIAL MASTER: Between you and
3 Mr. Merrill, could you assign duties once in awhile
4 and maybe he can take a piece of the action in the
5 case? Why don't you pick the two weeks you want
6 there, that the State wants off, and we will try to
7 accomodate you.

8 MR. WHITE: Can I pick them later? I'm
9 not sure exactly when the elk season starts, but
10 I know it's always in October.

11 THE SPECIAL MASTER: All right. Now, I
12 want to say a word about -- we get into some
13 problems occasionally in this lawsuit because of
14 my trying to limit the minute detail of evidence,
15 and one or two of you I know on both sides are getting
16 a little bit exasperated with me when I cut you
17 short. I know I have the law with me and the judges
18 with me who supervise at my proceedings when he
19 says shorten it up, go to the next point, conclude
20 the evidence as soon as it's clear, and let you make
21 a conclusion from that evidence and stop any further
22 examination, if you can. I try to do that, but I
23 can't do that in the first few hours of any witness
24 because he's in a theme and program of his whole
25 case, like what happened to Dr. Mesghinna yesterday.

end 3

1 But when we get into that matter, clearly
2 it's repetitive and duplicative and that serves no
3 purpose, I'm going to rule that is enough evidence,
4 I don't want to hear anymore on that. I don't want
5 to make any of you unhappy, but I'm serving notice
6 upon you now.

7 If we don't, we could be dragging this case
8 of for another year or two, and we don't have to do
9 that; it will be dragging itself. It's too complex,
10 too unprecedented, too novel in the law, too new
11 in the Rocky Mountain West for any guidelines. There
12 are no guidelines, no one can give me any guidelines.
13 There aren't any. There just aren't any.

14 So the only way I can go is to set my
15 own way as a pioneer in this thing. I feel like the
16 Dutch boy in South Africa in 1720 from Mr. Michener's
17 novel. It is a whole new world as you're plowing
18 through this material.

19 Okay. You all understand it's going to be
20 that once I feel I've got enough of the subject
21 matter to make a conclusion, I'm going to say,
22 "That is enough; that's all I want to hear. Let's
23 go to the next point," and maybe I'll help shorten
24 these weeks myself.

25 MR. ECHOHAWK: All right.

1 THE SPECIAL MASTER: Okay. We're down
2 through September 25th and that's not bad, with
3 a notation there will be ten days through two weeks
4 through October, if you want.

5 MR. WHITE: Right, Your Honor.

6 THE SPECIAL MASTER: We had something
7 else, too, Leo. I forget what it was, now.

8 MR. WHITE: Do you want to make settings
9 for November and early December?

10 THE SPECIAL MASTER: No, no. Good Lord,
11 we're already through September, we've got July,
12 August and September. You may have another Special
13 Master by then if I don't do something about getting
14 this case finished. That's all we need is to have
15 that and to have me with all these facts in my
16 head and not be around to finish the case.

17 MR. ECHOHAWK: It would be a good idea to
18 make settings in November and December just to be
19 safe.

20 THE SPECIAL MASTER: I wanted to have the
21 case completed, if humanly possible. I don't want
22 to go into next year.

23 MR. ECHOHAWK: There is a chance we will
24 drag out to early fall with the United States' case.
25 Then we have the Tribes' case and the State's case.

1 If we get into, say, October and November and
2 December, if we don't make some setting now, perhaps
3 Mr. White may require some later settings and would
4 carry into January.

5 THE SPECIAL MASTER: The only way you're
6 going to have adequate and ample time for the Tribes'
7 case or the State and for the matter of the Forest
8 Service and the BLM is to shorten up the work now.
9 To take days or weeks here is not necessary to the
10 adjudication of Indian water rights. We are back to
11 the same subject matter, and you control that.

12 MR. ECHOHAWK: I want to be safe in case
13 it does string out. I hate to get to that point
14 and have Mr. White have other trial settings. If
15 we could put them down tentatively --

16 THE SPECIAL MASTER: The other settings
17 don't bother me. But the State of Wyoming has a
18 case to put on and the Tribes' have a case to put
19 on and I can't do much about shortening that up.

20 What bothers me is I think we have got to
21 move through this with a little more regard for
22 germaneness -- or not germaneness but succinctness
23 and compactness and in the gist of the testimony to
24 spend perhaps a little less time on it, however,
25 informative and excellent. Spend a little less time

1 on that detail that seems to have gone on in some
2 of our evidence. I guess I can't say that fairly,
3 because some of the details are necessary for making
4 a conclusion on the water decision..

5 MR. ECHOHAWK: It is complex, and as we go
6 forward it gets more complex. We have the economics
7 and the flows for fish, and the hydrology --

8 THE SPECIAL MASTER: It can't get anymore
9 complex than determining arability, engineering the
10 land, setting up the matter that -- it can't get much
11 more complex, I don't think. We may be in for a
12 surprise; you think so?

13 MR. ECHOHAWK: Right.

14 MR. WHITE: It's going to get much more
15 complex.

16 THE SPECIAL MASTER: Well, let's get on
17 with Dr. Mesghinna who's probably thankful that
18 he's an agricultural engineer and not a lawyer.

19 If those books bother you, the law books,
20 we can move them off the desk, Dr. Mesghinna.

21 THE WITNESS: It's okay.

22 DIRECT EXAMINATION (CONTINUED)

23 BY MR. CLEAR:

24 Q Dr. Mesghinna, I believe when we finished up
25 mesghinna-direct-clear

1 yesterday we had gone through your eleven point
2 outline and had finished up the pipe network
3 design systems; is that right? Or had we gone
4 through the pump and pumping plants?

5 A Yes, yes.

6 Q So can you briefly run through the remaining
7 points on your engineering design with the
8 canals and related structures in your study?

9 A Okay. The next step after the pump and pumping
10 plant is obviously the canals and related
11 structures.

12 In order for the pumps to be served by
13 the amounts of water necessary, we need a
14 system or a canal that will serve these areas.
15 When I say a "Canal and related structures",
16 what I mean is the canal that starts from the
17 water source. In this case, from the rivers
18 or streams with the head structure and a
19 spillway and it goes along all the way from the
20 start of the river towards the end of the areas
21 in which it serves.

22 When the canals are positioned in the
23 areas in each of the units, they were made
24 after, you know, after great going back and

25 mesghinna-direct-clear

1 forth and looking which one is the best route
2 for the canal to serve with the least cost,
3 what you call, "Elevation". So I don't think
4 I have to go into that, because we have to make
5 things as concise as possible.

6 So the canal includes the diversion
7 structures, the canal itself that carries the
8 water. It includes also an operation and
9 maintenance road along the canal in case some-
10 thing happens to the canal or to the pumps so
11 that people can move back and forth alongside
12 the canal. That we call operation and maintenance
13 roads. It includes siphons, Siphons are nothing
14 but pipes that take the water, cross the water
15 through major streams -- I mean major creeks,
16 so we call those siphons.

17 The other structures necessary for a canal
18 are things like fences so that cattle may not
19 enter into the canal or some other things;
20 drop structures -- when you change from one
21 elevation to another, then you need to drop
22 the water -- drop structures and so on, and
23 there are many other things which may not be
24 necessary to, you know, to go into them one by

25 mesghinna-direct-clear

1 One. Such as, for example, road crossing --
2 there might be a road that crosses a canal --
3 we have to allow some cost for it. There could
4 be culverts necessary to small creeks; then
5 that is also included in the cost of the canal
6 and so on. When we say a "Canal" it includes --
7 and related structures -- it includes all this.

8 All our canals have the same slope -- when
9 I say "Slope" there are two kinds of slopes in
10 a canal: The longitudinal slope, which is along
11 the canal slope --

12 Q Would you --

13 THE SPECIAL MASTER: Longitudinal slope?

14 Pardon me, go ahead Mr. Clear.

15 Q (By Mr. Clear) Could you use Exhibit C-248 to
16 show --

17 A Yeah, okay. This is the canal I am talking
18 about, and one of the related structures is
19 shown in here. This is a diversion structure;
20 it has a spillway. That is what I said before,
21 a spillway, and this is the headgate where we
22 open the water in order to operate the canals.
23 So the canals delivers water to each of the
24 pump stations.

25 mesghinna-direct-clear

1 through, and also we have some kind of
2 triangular in shape, have shaped small canals
3 that lets the water not to be collected along
4 the side of the canal so that it moves freely
5 and then goes to the culverts and this is the
6 same in this one.

7 THE SPECIAL MASTER: Sort of a back slope
8 situation? Like a road?

9 THE WITNESS: Yes, just like a road, a
10 sort of channel along the road.

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meshghinna-direct-clear

1 THE WITNESS: So when I say the other slope is
2 in-slope, this one is not drawn to scale (witness
3 indicating). So what we are saying is in order to
4 be safe so that the canal does not slack, doesn't
5 fall out, what we are doing is we are saying for
6 every 1-foot vertical, it will be 2-feet horizontal.
7 So this slope is called a 2 to 1 slope. You know,
8 we can go to 1 1/2 to 2. It can be probably still
9 safe with no problem.

10 THE SPECIAL MASTER: Does the other side of the
11 canal also have the same application?

12 THE WITNESS: The same thing also this way
13 (witness indicating). So what we are saying is that
14 we would flatten the canal as much as possible.
15 That will make it safe, stable, but it costs more
16 because you have to excavate more from there.

17 Okay, so in a sense, this is what the canal
18 is. Let's assume that if the water level is here
19 (indicating) when it travels, then we design it a
20 little bit higher than what the canal is supposed
21 to carry in case of emergency, you know, because
22 sometimes somebody might make a mistake and he
23 might open the gates and he might flood out the
24 area. So in case of emergency, there is water

25 mesghinna - direct - clear

1 to flow in here. So we design it more extra than
2 what is needed to carry the water, and that will
3 cost a little bit more, but that's the way how it
4 is.

5 THE SPECIAL MASTER: Okay. Now, could we, Mr.
6 Clear, could we proceed to drainage analysis and
7 let you know of something that's needed in the canal
8 in the way of structures that's not already on re-
9 cord?

10 MR. CLEAR: I think there is a question on
11 cost of the excavation of the canal, and more im-
12 portantly, Your Honor, it's the efficiencies which
13 we have discussed with relation to the --

14 THE SPECIAL MASTER: All right. Would you ask
15 it on those then, please?

16 Q (By Mr. Clear) Could you briefly discuss then, Dr.
17 Mesghinna -- this is the conveyance efficiency?

18 A Yes.

19 Q Could you go into that and to the question of your
20 canal costs and so forth?

21 A Yes. As to canal costs, as I have mentioned and
22 tried to make it as concise as possible, it includes
23 the costs of excavation and compacting operation
24 and maintenance roads. It includes the cost of

25 mesghinna - direct - clear

1 fences, diversion structures and so forth.

2 The other thing of importance that you have
3 mentioned is the conveyance efficiency. I haven't
4 addressed it so far because that is an important
5 point for the water duty. So far, we have discussed
6 about two efficiencies, application efficiency and
7 distribution efficiency, and in order to determine
8 the overall efficiency of the system, we need to
9 know one more efficiency, and that is the conveyance
10 efficiency.

11 The conveyance efficiency is nothing but the
12 ratio of the water delivered at the point of the
13 source, divided into the amount of water delivered to
14 the pump stations, so this is really what is convey-
15 ance efficiency. So if we determine conveyance ef-
16 ficiency; we know distribution efficiency, we know
17 application efficiency; so if we -- the product of
18 these three items will become the overall efficiency.
19 So if we divide the net irrigation requirement by
20 overall efficiency, that will give us our water
21 duty in a short way.

22 Now, how to determine conveyance efficiency,
23 I think this is a very important point to all of us
24 here to get into a discussion about it. Conveyance

25 mesghinna - direct - clear

1 efficiency is one of the most complex things to
2 determine. There is no, so to say, practical,
3 theoretical way of coming to it. We merely depend
4 on experiments that have been done before this time
5 and so on and so forth; base it on limited data that
6 we have and base it on your judgment, then you come
7 up with a conveyance efficiency.

8 In order to do this, there are some what you
9 call equations. One of the equations is called the
10 Moritz formula, and in order to come up with our
11 conveyance efficiency, we used that formula. And
12 just to state it briefly, S equals 0.2 times C,
13 square root Q over V; where V is velocity, Q is the
14 flow in c.f.s., meaning cubic feet per second, and
15 C is the amount of water lost in cubic feet within
16 24-hours' time per square foot of wetted area of the
17 canal prism. Of course, .2 is just a constant. How-
18 ever, that equation is quite complex to solve it,
19 and one has to go through, again, a computer in
20 order to do that. And the thing that makes it more
21 complex, we have several reaches, you know, in the
22 canal. For example, if we take the North Crowheart
23 Canal, there are 44 reaches in it.

24 Q Define what a reach is.

25 mesghinna - direct - clear

1 A A reach is a distance between -- most of the time
2 between two pumping stations. So what I'm trying
3 to say is we try to determine the seepage losses
4 between each pump station. Okay, so the computer
5 has to go through all these reaches, scan it out
6 and find out the total seepage or the seepage at
7 each system.

8 THE SPECIAL MASTER: How were irrigation systems
9 built, designed and put into operation before com-
10 puters were designed?

11 THE WITNESS: Merely experience, really. This
12 matter of irrigation systems is -- it has to do a
13 lot with arts, really. It's not -- it's not a com-
14 plete science. During the last 10 or 20 years, you
15 know, things have come up in a more scientific way,
16 the ways that we have been discussing about, water-
17 holding capacities and so on, and all these things.
18 So I think in the last 20 years things have advanced.

19 THE SPECIAL MASTER: More than ever theretofore?

20 THE WITNESS: Yes. At a very high rate, really.
21 Se we used a computer aid in order to come up with
22 different seepages. Now, there is another thing
23 that has to be addressed in here in connection with
24 the seepage loss. It's not only seepage loss or

25 mesghinna - direct - clear

1 evaporation from the canal, there is another loss
2 that people cannot avoid and that we will call it
3 operational waste. Whether we like it or not,
4 whether we have the most advanced person or people
5 in the canal operating a system, there will always
6 be operational losses.

7 What I mean by this is sometimes, for example,
8 it might rain, but -- so the fields might get enough
9 water from the rainfall. What do you do? You already
10 have your canal running out. So you have to somehow,
11 you know, take out the water from the canal system
12 to the creeks and other areas. So this we have to
13 do in order to design the canal, we have to design
14 it extra to carry this water.

15 Okay. You waste it at different points, you
16 know, wherever you have areas where you think are
17 good places along the canal to waste water when
18 necessary.

19 So, again, on the wastes people think from 5
20 to 20 percent, they allow waste from 5 to 20 per-
21 cent as much as they can.

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23
24 * * * * *

25

1 A (Continued) However, in our case we have
2 used about ten percent of waste to design
3 the canal. So what we did is in order to
4 come for -- let me say it right -- in order
5 to come for the efficiency, we came up with
6 efficiencies not only for the whole season,
7 but for each month, month by month, starting
8 from May, June, July, August, September, then
9 we found out all the efficiencies -- conveyance
10 efficiencies, including the operational waster

11 Then we know the distribution efficiency
12 and the application efficiency at the farm
13 level. Then we know our overall efficiency and
14 you divide that by what you call the net
15 irrigation requirement. Then we get the net
16 irrigation requirement -- I mean the water duty.

17 Q One more question and very briefly, back to
18 the cost. Where did you get your information
19 to figure your cost on the canal system?

20 A Most of our information is from Bureau of
21 Reclamation.

22 Q Bureau of Reclamation, um-hum.

23 MR. CLEAR: Your Honor, I have not offered
24 into evidence Exhibit 248, which is the drawing
25 mesghinna-direct-clear

1 of the typical irrigation diversion and
2 distribution system which is basically an
3 illustration of the whole distribution
4 system which Dr. Mesghinna has testified about.

5 I would like to offer that into evidence
6 at this point.

7 MR. WHITE: Just one question, if I might,
8 Your Honor.

9 VOIR DIRE EXAMINATION

10 BY MR. WHITE:

11 Q Did you include calculations of elevation loss
12 for your canal in your analysis?

13 MR. CLEAR: I'm going to object to that,
14 Your Honor, it's not proper voir dire.

15 MR. WHITE: If it shows --

16 THE SPECIAL MASTER: Just a minute. I
17 am going to sustain the objection. That
18 question is not proper voir dire. You can
19 ask the question of the witness when you get
20 cross-examination. You probably have 500
21 questions like that, but the time is on cross-
22 examination not at this point.

23 MR. WHITE: Let me ask again for the purpose
24 of the offer? It is illustrative of what?

25 mesghinna-voir dire-white

1 MR. CLEAR: It's an illustration of Dr.
2 Mesghinna's -- what he means when he is talking
3 about a canal system, diversion structures,
4 pump station and on-field irrigation distribution
5 system from the diversion point of the river
6 to the application in the field. Generally
7 showing the areas which he has discussed under
8 four, five, six, and seven, which are outlined
9 on the board.

10 MR. WHITE: I wanted to make sure that
11 it's not offered to illustrate his analysis
12 or his methodology.

13 MR. CLEAR: No.

14 MR. WHITE: Let me ask one more question,
15 then.

16 Q (By Mr. White) You show a diversion structure
17 on there, and if the offer is for the purpose
18 of showing the diversion structure, could you
19 state whether or not that diversion structure
20 would be within or below the high water line
21 of the river?

22 A Could you state that question again?

23 Q Yeah, I'll do it again.

24 Is this diversion structure shown on
25 mesghinna-voir dire-white

1 Exhibit 241 below or above high water line
2 of the river shown there?

3 A Well, what you do is you have to make sure
4 that your spillway height -- this is the
5 spillway, that's the thing that collects the
6 water so that you can divert water to here.
7 Your water level here has to be higher than
8 here in order for the water to flow.

9 Q So you actually built a structure in the bed
10 of the river?

11 A Yes, yes. It flows across the river.

12 MR. WHITE: No objection, Your Honor.

13 THE SPECIAL MASTER: U.S. Exhibit WRIR
14 C-248 will be admitted into evidence and will
15 be described as a drawing of typical irrigation
16 and diversion distribution system.

17 (Whereupon, U.S. Exhibit
18 (WRIR C-248 was hereby
(admitted into evidence.

19 DIRECT EXAMINATION (CONTINUED)

20 BY MR. CLEAR:

21 Q Now, Dr. Mesghinna, you stated right now if
22 your planning system or your system or conceptual
23 system or opinion, once you have completed
24 point seven as canals and waters, you have a

25 mesghinna-voir dire -white
mesghinna-direct-clear

1 water duty at that point; is that correct?

2 A Um-hum.

3 Q Should we go on to the drainage analysis?

4 THE SPECIAL MASTER: You mean it has the
5 water duty at point seven; is that right?

6 THE WITNESS: Yeah, I think what Mr.
7 Clear is saying is the drainage system has
8 not much to do with the water duty, really.
9 It is to protect the land from being sour,
10 so in a sense we are almost ready now to say
11 what the water duty is, if necessary.

12 THE SPECIAL MASTER: Um-hum. I see, I
13 appreciate that. Go ahead.

14 MR. CLEAR: What we want to do, Your Honor,
15 is complete the eleven steps and then we can go
16 back and quickly just plug in the numbers and
17 just --

18 THE SPECIAL MASTER: Okay.

19 Q (By Mr. Clear) Should we go on to drainage
20 analysis now?

21 A Um-hum.

22 Q We're done with canals, I take it?

23 A Yeah.

24 Q Let's go on to drainage, then.

25 mesghinna-direct-clear

1 A It would be appropriate if we can have another
2 drawing that shows drainage.

3 Q Is this it?

4 A Yeah.

5 (Mr. Echohawk put a
6 (drawing on the board.

7 MR. CLEAR: Let the record reflect we have
8 put on the easel U.S. Exhibit WRIR C-256, a
9 drawing entitled Subsurface Drain.

10 A Before I go into it, I would like to make clear,
11 you know, really what drainage is. When we
12 talk of drainage in agricultural lands, many
13 people, even experts in the field, think that you
14 don't need to have drainage with sprinkler
15 irrigation. That's the reason you put sprinkler
16 irrigation in order to be more efficient and
17 so you don't have drainage problems, and I
18 respect that idea, but I believe in order to have
19 a secure system, overall system, it is necessary
20 or important to have a drainage system to
21 include drainage in an irrigation project.

22 THE SPECIAL MASTER: Whether sprinkler or
23 gravity, hum?

24 THE WITNESS: Yes, whether sprinkler or
25 mesghinna-direct-clear

1 gravity.

2 A The hazzards are much less in sprinkler.
3 That's what I'm saying. The hazzards with
4 drainage problems, in fact it is my belief
5 and my philosophy that whenever someone thinks
6 of irrigation, he should also think of drainage
7 with it.

8 I mean, it is not -- I mean, irrigation
9 does not just mean apply water to your plant
10 and the plant grows. There are side effects
11 behind it, so we should think about those
12 side effects.

13 What are drainage problems? There are two
14 kinds of drainage problems. One is called
15 "Surface drainage". That is when you have
16 surface water collecting in an area. We call
17 that surface draining. But surface drainage
18 is a very easy matter, very easy for the farmer
19 to see and easy to correct it. It's just to
20 find a way to take out the water.

21 So is the sprinkler irrigation. It's not
22 taken as an important thing. The important
23 thing is the subsurface drainage. That is the
24 second problem, subsurface drainage.

25 mesghinna-direct-clear

1 What is subsurface drainage? First of
2 all, there is no drainage problem in all the
3 future lands, now. There is no problem; we
4 are anticipating there will be problems in
5 the future. So we are putting these drainage
6 system just to protect our crops and our lands
7 to secure health -- healthy environment for the
8 future. This would come after several years,
9 the problem, but what we are trying to do, we
10 are trying to show another cost at this time.

11 Okay. What happens is the more we apply
12 water into irrigation for irrigation then we
13 have to expect that the water table will rise
14 up, you know. If we apply water this year,
15 later water will be collected down there next
16 year, the year after, and so, and so forth. It
17 will be collected and goes up.

18 Okay. So how does this thing work? There
19 are two ways in which this drainage problem
20 can work. One is the water table can rise up,
21 way up like this (indicating). The other is
22 the water can move towards, from higher areas,
23 to lower areas and destroy lands downstream.
24 So we have to protect this area.

25 mesghinna-direct-clear

1 Aside from this, there are other problems
2 that happen, and that is water logging will
3 create mosquito problems, you know. If you see
4 an area that have drainage problems, you see
5 mosquitoes and so on. That is unhealthy for
6 human beings and other animals, so we have to
7 protect that. The other area is when the
8 plants take water from down the water table,
9 they take both the water, including salts if
10 there is salts in the water, although in the
11 area we don't have that kind of problem. So
12 what they do is they transpire the water part
13 and they leave the salt part of the surface
14 of the soil. So we see a lot of areas, salted
15 areas. There are millions of acres that have
16 been lost completely that probably requires
17 billions of dollars to reclaim in the world now.
18 Especially in countries like Pakistan, Iraq,
19 and so on, and also in this country in California
20 and other places there are completely destroyed
21 lands from these problems.

22 So we are trying to -- we know that problem
23 from experience, so we don't want that problem
24 to happen to us, so we have to include drainage.

end 6

mesghinna-direct-clear

1 THE SPECIAL MASTER: What can be done to re-
2 claim that land? Is it a case of amendment with
3 the use of acids?

4 THE WITNESS: That's exactly what has to be
5 done. For example, in Iraq where they have invested
6 billions of dollars to reclaim the land which has
7 been salted out due to early irrigation during the
8 Babylonian time and so on, what they have done is
9 they have put amendments, chemicals, and they have
10 built all kinds of crossing canals from place to
11 place to, you know, to what you call take out the
12 salts. They put amendments and water on top of
13 the land, and the water leaches out the soils and
14 all the unnecessary material. In doing so, you
15 lose also the quality of the soil because you are
16 leaching out the nutrients of the soil.

17 THE SPECIAL MASTER: Doesn't some of the salt
18 also transpire with the water or find its way to
19 the drainage drains and get back into the main flow
20 of the irrigating stream, like in the Colorado River
21 problems and Upper Sandy River problem? It's not
22 in this water division, but it's a big, big problem.

23 THE WITNESS: It is a big problem in Colorado.

24 THE SPECIAL MASTER: Diversion streams, is that

25 mesghinna - direct - clear

1 the name of it?

2 THE WITNESS: When the water reaches Mexico,
3 it's almost salt. It has almost 3,000 TDS, if I
4 remember it.

5 THE SPECIAL MASTER: Some also goes to the water
6 and some stays in the land for the damage?

7 THE WITNESS: If you don't drain it. If you
8 drain it, it seeps it out in the drains. That's the
9 reason we use the drains. Then the drains take it
10 out and take it out to the river. So that's the
11 whole problem of drainage. So how do we correct
12 this?

13 THE SPECIAL MASTER: You are talking now about
14 how to correct it in the North Crowheart?

15 THE WITNESS: In the North Crowheart. Yeah,
16 I'm coming back to my problem.

17 THE SPECIAL MASTER: You are not generalizing,
18 you are coming back to the specific matter?

19 THE WITNESS: Yes, yes. Salt is not a problem
20 in our case, but what is a problem is water logging
21 is a problem. What happens is if the water goes up
22 to the roots of the what you call plants, it opens
23 all the space, water, but one thing that we have to
24 remember is that a plant requires three important

25 mesghinna - direct - clear

1 ingredients. One is the air, the other is water,
2 the other is light or warm things in order to grow.

3 THE SPECIAL MASTER: Yeah.

4 THE WITNESS: So if there is water logging,
5 meaning that if the area, if the ground is saturated
6 with water, it occupies the air part, you see. So
7 what happens to the roots of the plant is it starts
8 to decay, it starts to die. And if the roots aren't
9 there, it will die. So that's the problem that we
10 want to avoid.

11 So, in order to avoid that, what we have to do,
12 we have to limit the water table to a certain point.
13 So, with that in mind, let me explain this little
14 picture over here.

15 (Whereupon the witness is refer-
16 (ring to an illustration.

17 As I said, when we apply water through irriga-
18 tion, some of the water, you know, goes to surface
19 runoff, which is very small, small in sprinkler
20 irrigation. Some of it, while the sprinkler is
21 irrigating like this (witness indicating), you know,
22 it evaporates and we lose it. What we are concerned
23 with is the amount of water that deep percolates
24 inside here.

25 mesghinna - direct - clear

1 So what it does, according to testimony that
2 we have had from Mr. Toedter, there is water in the
3 impermeable barrier. So the impermeable barrier
4 has been defined as a layer beyond which the hydraulic
5 conductivity of this barrier is at least once of the
6 hydraulic conductivity above it.

7 So it doesn't pass water. The water will re-
8 main, let's assume. It will leak. Most waters leak,
9 you know. But, let's assume, you know, just to be
10 sure, the water will stay here. So what happens is
11 the first year we irrigate, the water comes up here.
12 The second year it comes up here, and so on and so
13 on. It goes up, up, then it comes to the plant roots
14 here. We don't want that to happen, so we have to
15 limit that.

16 In order to limit that, then we put drains, and
17 those are the drains (witness indicating). The
18 drains are perforated pipes. Perforated pipes, but
19 we put also what we call gravel envelope --

20 THE SPECIAL MASTER: Gravel envelope?

21 THE WITNESS: Yes, gravel envelope.

22 THE SPECIAL MASTER: Size of gravel rocks,
23 that's a little bit larger than the size of the
24 perforations?

25 mesghinna - direct - clear

1 THE WITNESS: Yes. It used to be called a
2 few years back filter material. It filters out,
3 but it doesn't work as a filter. So, at any rate,
4 we have this gravel envelope around it, and what it
5 does really, the gravel envelope, it makes the pipe
6 diameter bigger, it makes it bigger in a sense be-
7 cause when the water comes like this, when it gets
8 there, it is transferred because there is nothing
9 to hold it. The soil is gravelly material and the
10 water can percolate easily and enter into the pipe
11 and find its way out. So the whole thing of the
12 matter in drainage systems or analyses that I have
13 said is to determine the costs -- I mean, determine
14 the spacing of these drains because, if we put them
15 far apart from each other, the water table will go,
16 you know, up. If we put them too close, it might
17 do -- it might --

18 THE SPECIAL MASTER: It might do the job, but
19 inefficient?

20 THE WITNESS: It might do the job, but ineffi-
21 cient, yeah. It's too expensive.

22 THE SPECIAL MASTER: Yeah, too expensive.

23 THE WITNESS: So we have to find a way in
24 which this one will work in the most optimum manner.

25 mesghinna - direct - clear

1 So what do we have to consider in order to do this?

2 In drainage systems, three things are important
3 to consider: One is the hydraulic conductivity of
4 the soil; the second thing is the depths to the
5 barrier, and the third thing is the amount of deep
6 percolation.

7 THE SPECIAL MASTER: The third thing is what?

8 THE WITNESS: Amount of deep percolation, the
9 amount of water that percolates inside. They call
10 it also replenishment rate. Replenishment rate.

11 THE SPECIAL MASTER: Replenishment rate?

12 THE WITNESS: Yes. Okay, when we talk of
13 hydraulic conductivity, I don't want to go to the
14 details now --

15 MR. CLEAR: I think some of that was explained
16 by Mr. Toedter.

17 THE WITNESS: If it was explained, then I'll
18 just leave it.

19 THE SPECIAL MASTER: We put a good day in on
20 hydraulic conductivity, so we feel we are with you
21 on that.

22 THE WITNESS: Mr. Toedter explained hydraulic
23 conductivity, but it is the hydraulic impermeability,
24 as you might have heard.

25 mesghinna - direct - clear

1 The other thing is depths to barrier. The
2 depth to barrier is a minimum of 6 feet, and I
3 think I will assume you have got that from Toedter,
4 too.

5 Q (By Mr. Clear) You got that information from
6 Toedter also?

7 A. Yes, yes. So I don't want to go through that.

8 The third thing of importance is also the
9 deep percolation, and the deep percolation for
10 sprinkler irrigation is not much. However, we
11 have used 18 percent of our applied water will
12 enter to this --

13 THE SPECIAL MASTER: Eighteen percent?

14 THE WITNESS: Eighteen percent will enter
15 into the drains.

16 Okay, based on this, there are two methods
17 in which to design a drainage system. Now, we
18 have our basic data how to design the system.

19 So, in general, there are two ways how to
20 design the system: One is called the transient
21 or dynamic equation in which Toedter was, I
22 think, addressing it to a certain extent last time.

23 They have a computer program and so on that does
24 those things. And that method is used in, I

25 mesghinna - direct - clear

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2 depth to barrier is a minimum of 6 feet, and I
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20 design the system: One is called the transient
21 or dynamic equation in which Toedter was, I
22 think, addressing it to a certain extent last time.
23 They have a computer program and so on that does
24 those things. And that method is used in, I

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1 believe, this is my own assessment, by a few agencies
2 and especially by the Water and Power Resources, which
3 is the USBR. The other one is used internationally
4 and also by agencies like the Soil Conservation Ser-
5 vice and most private firms and, you know, who are
6 in this kind of profession, is called steady-state.

7 THE SPECIAL MASTER: Steady-state?

8 THE WITNESS: Steady-state, s-t-e-a-d-y, and
9 state is like a state. Steady-state equations.

10 Okay, steady-state equation, this equation was
11 developed in the Netherlands when they claimed --
12 they claimed their water, you know.

13 THE SPECIAL MASTER: The dikes?

14 THE WITNESS: Yes, the dikes and so on. So I
15 don't want to go through that also.

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1 A Okay. The steady-state equation is nothing,
2 but what it is saying is the act of water
3 that enters into the soil is steady. Once you
4 start the irrigation gate you'll have water
5 all the time, during peak times, they assume
6 during the peak times, so that water always
7 enters there, so you have to say irrigate it.
8 In reality that may not be true. The water
9 does not enter all the time. Sometimes there
10 is a slack time, but you assume anyway peak
11 time.

12 Okay. So an equation was developed first
13 by people in the Netherlands and also people
14 in the USBR work on it still, even though they
15 use the other method and a gentlemen by the
16 name Donnan have worked on it, Donnan, D-o-n-n-a-n,
17 into it. And so on.

18 Okay. So the equation simply states that
19 S equals the square root of 4 times K times M
20 open bracket M plus 2-A close bracket over q,
21 small q.

22 What it means is -- S stands for the drain
23 spacing, q, small q, is that I said is the amount
24 of water that enters in here (indicating).

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1 THE SPECIAL MASTER: Applied water?

2 THE WITNESS: Yes. The amount of water
3 at deep percolation, the portion of water that
4 deep percolates.

5 A M is -- let me write it in the blackboard. It
6 will be easier, I guess.

7 (The witness approached
8 (the blackboard.

9 I might have drawn this a thousand times in
10 my life.

11 THE SPECIAL MASTER: We're familiar with
12 that, too, I think.

13 A Okay. We have the plants, the plant surface is
14 here. And let's assume for all practical purposes,
15 for illustration, this is an impermeable area --

16 THE SPECIAL MASTER: Impermeable area.

17 A Right. Okay -- M is the distance from here to
18 here (indicating). A is the distance from here
19 to here (indicating), and we are assuming that
20 we'll put the drains seven feet below the ground
21 and we'll have four feet between the highest
22 point of the water level. The highest point
23 of the water level -- it's always lower than
24 it, you start with seven feet below the ground.

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1 Then it comes up to four feet. We are assuming
2 four feet in here (indicating). So this will
3 be naturally to three and this is variable,
4 depending on how deep it is, and this is the
5 drains and this is the water table (indicating
6 several times).

7 This is really exaggerated, you know.
8 Ordinarily it's flat.

9 I think someone might argue here. You
10 have your weighted depths of 4.5 yesterday --

11 Q (By Mr. Clear) That was the weighted depths
12 of the roots?

13 A Yeah, of the roots, and now you have four feet.
14 What happens to the 4.5 feet?

15 In design you, -- in fact, I believe the
16 USBR goes from 3.5 feet lower than it. What
17 happens is that point is a very small portion
18 of the area. It's a very, very small portion
19 in the middle between the drains, so it is
20 happening for a short time and in a small area
21 so you don't have to.

22 THE SPECIAL MASTER: You've been talking
23 for an hour, now. I don't want to hurt anybody's
24 throat. Let's take a break.

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1 (At this time there was
2 (a brief recess had in the
3 (proceedings.

3 THE SPECIAL MASTER: Let's resume, ladies
4 and gentlemen.

5 All right, Mr. Clear.

6 Q (By Mr. Clear) Doctor, I believe you were in
7 the middle of your steady-state formula explaining
8 how it happened. Could you go on with that?

9 A Yeah, okay. From -- by -- we apply that formula
10 which is called "Steady-state Equation" and I
11 have explained it, what it is, really, and we
12 determined the spacing of the drains.

13 Now, these are subsurface drains but also
14 we have to make allowances for other kinds of
15 drains which are ditch or small canals. We
16 call them open drains and these open drains
17 are drains that collect the water that comes out
18 from the drains themselves.

19 THE SPECIAL MASTER: Yeah, we see it on
20 256.

21 THE WITNESS: Yes, it's there.

22 A And those other are other drains. Also there
23 are other smaller channels that would collect
24 water and also drain it to the outlet, you know,
25 mesghinna-direct-clear

1 outlet ditch. They are called outlet ditch.

2 So we have this and we have included the
3 costs of this.

4 Okay. After we determined the spacing
5 of the drains, we should also determine the
6 sizing of what you call drains.

7 THE SPECIAL MASTER: Drain pipes?

8 THE WITNESS: Drain pipes, yeah.

9 A We can go up to four inch of drain pipes, but
10 we made a limitation of to six inch, because
11 it is in construction easier to use six inch,
12 although it costs a little higher. It's easier
13 for construction, expedite construction. It's
14 easier to handle six inch rather than four inch
15 pipes.

16 So we have six inch pipes, we have eight inch
17 pipes, and we have ten inch pipes. The cost
18 of this we determined from the costs that had
19 been done in Riverton itself and the reclamation
20 area. From the lower --

21 THE SPECIAL MASTER: Does the Riverton
22 Reclamation District use a six inch pipe?

23 THE WITNESS: I think they used six-inch
24 pipes too, yeah. Variable, you know, it varies

25 mesghinna-direct-clear

1 depending on the kind of flow that they get
2 there.

3 A So at any rate, by taking the low bids, starting
4 from 19 -- I guess 1975 or '76 or '73 -- I
5 don't remember the date of the different costs
6 of drains -- we jack them up to 1979 costs by
7 indexing method from the Bureau of Reclamation
8 and we came up with these costs and for the
9 drains for the open drains for the small open
10 drains we came up with a \$2 per feet, you know.
11 These are open ditch and for the bigger open
12 drain we came up with \$6 per feet, you know,
13 for this just excavated, and these are just
14 outlet ditches.

15 So in a sense when we speak of drainage,
16 it includes all these costs of the pipes, the
17 costs of the drains, and there are other things
18 that also are necessary there, you know, such
19 as manholes, you know, where people can check
20 what is happening in the drain if it clogs,
21 and so on.

22 So the costs are integrated together in
23 these pipes. The cost I gave you, for example
24 for six inch pipe is \$5.82; for eight inch pipe

25 mesghinna-direct-clear

1 is \$8.69; for ten inch pipes, we used \$13.22
2 per foot, respectively, and these include also
3 the other items related there, including the
4 gravel pack, and, you know, all the stuff that
5 is inside there, what is needed to construct
6 it. And I have said that these pipes, these
7 pipes are laid seven feet below the ground.
8 It is a common practice to lay pipes seven
9 to eight feet.

10 It is a bit cheaper to use seven feet,
11 but we used the eight feet cost for the seven
12 feet digging.

13 Q (By Mr. Clear) That brings an obvious question:
14 There's been much testimony among the limitations
15 of classes of land by HKM there is a six foot
16 barrier.

17 A Now there are problems. If we have an area
18 that has an impermeable barrier at six feet,
19 then we don't dig all the way and put the drain
20 at seven feet. We put it at six feet, because
21 we are limited by the barrier there.

22 THE SPECIAL MASTER: Sure.

23 A So there is a barrier, but it costs more, much,
24 much more, and one thing we have to realize also,
25 mesghinna-direct-clear

1 it does not mean that all lands require drainage.
2 Some are very thin, shallow, and they drain
3 by themselves. There is natural drainage.

4 Some lands are high, on a plateau,
5 and there is natural drainage that goes either
6 side. So one has to make all these judgments
7 and one has to see each and every area, how
8 it is going to react vis-a-vis the drainage
9 works, and so on.

10 Based on this, we came up with total cost
11 and comparative cost for each of the units.

12 THE SPECIAL MASTER: Each of the fields,
13 or each of the units?

14 THE WITNESS: Each of the units. We added
15 all the pipes necessary, you know.

16 THE SPECIAL MASTER: Um-hum.

17 THE WITNESS: How many probably in terms
18 of millions of feet of pipes or, you know.

19 THE SPECIAL MASTER: Are you going to
20 give those figures? Will that be brought out
21 later in the trial?

22 MR. CLEAR: Yes, when we go through these
23 specifically, we'll plug in the numbers, Your
24 Honor, for you. If we tried to explain what

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1 he did and explain at the same time what he
2 used and all the figures, I think it would be
3 very confusing to you.

4 THE SPECIAL MASTER: All right.

5 MR. CLEAR: But we will give you all that
6 and I think it is in his report, too.

7 THE WITNESS: It's in my report.

8 THE SPECIAL MASTER: Very good. I still
9 don't have a report, you know. That was given
10 back yesterday.

11 A Another question that might arise, probably,
12 I would like to make clear as I go along is
13 the one when we designed these banks of the
14 drains, open drains, instead of 2 to 1 slope.
15 Instead of a 2 to 1 slope we used 1 to 1.5 slope.

16 THE SPECIAL MASTER: 1 to 1.5?

17 THE WITNESS: Yes.

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1 THE WITNESS: Yeah, because there is not much
2 there, it's not a canal or anything. It carries a
3 very small amount of water that drains from the
4 pipes, and we believe it is stable. So, at any
5 rate, we came up with a total footage of pipes of
6 the different pipe drains and we added all those
7 pipe drains, including the costs of the open drains
8 and so on, whatever is necessary there, we added
9 them all up and divided them by the acreage of each
10 unit and we came up with a cost of each unit on a
11 per acre basis.

12 THE SPECIAL MASTER: How much per acre?

13 THE WITNESS: Do you want me to give you the
14 figures?

15 THE SPECIAL MASTER: No, I don't. You did come
16 up with a per acre cost base figure?

17 THE WITNESS: Yes. If it's necessary, it's right
18 in front of me.

19 MR. CLEAR: You testified --

20 THE SPECIAL MASTER: Why don't you want the
21 figure brought up now?

22 MR. CLEAR: I thought it would be easier to --

23 THE SPECIAL MASTER: Get into the other figures,
24 okay.

25 mesghinna - direct - clear

1 MR. CLEAR: We are just talking about the cost
2 of drainage now.

3 Q (By Mr. Clear) We have also discussed the cost of
4 on-farm systems design, pipe network system, pump
5 and pumping plant, canals and related structures.
6 All of those are related costs, too, right?

7 A. Yes.

8 THE SPECIAL MASTER: I'm sorry. Proceed.

9 Q (By Mr. Clear) Dr. Mesghinna, when you started this
10 drainage discussion, you said you used 18 percent as
11 the figure for deep percolation. Where did you get
12 that 18 percent figure from?

13 A. That is experience from the USBR.

14 THE SPECIAL MASTER: Is that a figure of deep
15 percolation, or was this a percentage of the applied
16 water that gets into a drainage system, or are we
17 talking about the same thing?

18 THE WITNESS: Yeah, the latter one. It is the
19 18 percent of applied water that deep percolates.

20 THE SPECIAL MASTER: Eighteen percent of the
21 applied water will enter into the drains?

22 THE WITNESS: Yes.

23 Q (By Mr. Clear) Where did you get that from?

24 A. From the USBR.

25 mesghinna - direct - clear

1 Q Should we go into Operation and Maintenance now?

2 A I think it's better to -- for the sake of time, it's
3 better if you need some clarification, we can come
4 back to this in cross-examination or examination.

5 Okay, now we have the project, we have the
6 on-farm system, we have the pipeline network system,
7 we have the pump and pumping plants. We have the
8 canals and related structures, we have the drainage
9 analysis, everything. So we have investigated
10 everything there and it's on the ground.

11 THE SPECIAL MASTER: We have everything except
12 water.

13 THE WITNESS: We have everything except water.

14 THE SPECIAL MASTER: And now we are in Operation
15 and Maintenance?

16 THE WITNESS: Yes.

17 THE SPECIAL MASTER: Is your O and M comparable
18 now to the classic operations and maintenance history
19 of the United States Bureau of Reclamation, what they
20 call O and M?

21 THE WITNESS: Yeah, except that there are some
22 slight differences in a sense because we have a lot
23 of tampering here, energy costs. They usually have
24 -- in most cases they have gravity flows.

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1 THE SPECIAL MASTER: Gravity?

2 THE WITNESS: But we have some additional costs.

3 THE SPECIAL MASTER: Because you're listing
4 water more than usual conditions?

5 THE WITNESS: Yes.

6 THE SPECIAL MASTER: Would you proceed in that
7 respect because I know you will shorten whatever you
8 can to save our time.

9 THE WITNESS: I'm trying to make it as concise
10 as possible.

11 THE SPECIAL MASTER: I appreciate that.

12 THE WITNESS: Okay. When we talk of operation
13 and maintenance, we are talking of realistically how
14 you operate the system. We have everything there,
15 but what kind of professional duty of people and
16 what kind of energy do you need, what kind of power
17 or demand costs do you need and so on, and how many
18 people do you need to work on the canal here and
19 there? So we are actually talking now how to
20 operate it, the systems.

21 Okay, as I have discussed earlier, there are
22 five units: North Crowheart, South Crowheart,
23 Riverton East, Big Horn Flats and the Arapahoe
24 Units. Okay, what we have assumed in this thing

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1 is when we operate these five units, we will divide
2 them into two administrative projects. We will have
3 two administrative projects. The first one is the
4 North Crowheart Unit will be administered from one
5 location. Just to make things easier, let's say it
6 will be administered from the little town or village
7 of Diversion Dam. Let's say the head office will be
8 there, those people who work on the operation and
9 maintenance of the North Crowheart Unit.

10 THE SPECIAL MASTER: Isn't that where the diver-
11 sion facilities and works are now for most of the
12 Riverton projects?

13 THE WITNESS: Yes. There is a small town there.
14 I don't know if you can call it a town. I'm just
15 saying anyplace it can be.

16 THE SPECIAL MASTER: Yes.

17 THE WITNESS: And the others are small units:
18 South Crowheart, Riverton East, Arapahoe and Big
19 Horn Flats. They are very, very small units com-
20 pared to North Crowheart. All these units can be
21 administered from one location. Let's assume for,
22 you know, simplicity sake, let's say they can be
23 administered from Fort Washakie, a more centralized
24 area. So based on this, what kind of professional

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1 duty people do we need in order to administer these
2 areas?

3 By the way, when I talk of operation and main-
4 tenance, operation and maintenance have nothing to
5 do on operating the sprinklers and so on of the
6 fields. That is up to the farmer. What I'm talking
7 about is to deliver the water from that, you know.
8 After that it's up to the individual farmer to
9 operate his, and that has been taken care of, those
10 costs have been taken care of by the economists.

11 So in the North Crowheart we would need, for
12 example, one water master; we'll need about two pump
13 specialists, you know, if something happens to the
14 pumps and so on; we will need one canal operator;
15 we will need heavy equipment operators of about two
16 people; we need a truck driver, one truck driver;
17 we'll need ditch riders who would see the canal is
18 working right, probably there are weeds here and
19 there, cleanup, and we need four of them; we will
20 need laborers also who would do certain things, you
21 know, here and there in canal cleaning and so on,
22 five of them; and also need a secretary or a dis-
23 patcher of the whole thing.

24 And we have given time of, for example, the
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1 water master would work twelve months per year,
2 and we said that salary would be \$19,000 per year
3 in 1979. Pump specialists can only work eight
4 months during the year because during the off
5 season there is not much to do. So for both of
6 them is total salary of \$20,000 for those eight
7 months. Canal operator only eight months per year,
8 \$8,000 per year.

9 THE SPECIAL MASTER: Why are we into costs by
10 dollars and so on when we avoided them in drainage
11 analysis?

12 MR. CLEAR: I don't think we have to go into
13 them.

14 THE WITNESS: Okay. At any rate, this is the
15 cost of what you call personnel necessary, but we
16 should also include in the operation and maintenance
17 the cost of what you call maintenance, good mains
18 and so on, based on USBR guidelines. We divided
19 the total professional salaries by .6, and that
20 will give us the overall cost of most of the main-
21 tenance, you know, and the operation.

22 We have gone through the same thing, only in a
23 slight difference, on South Crowheart Unit, Riverton
24 East, Arapahoe, Big Horn Flats, and we have assigned

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1 professional duty people. I don't think -- unless
2 it is necessary to say the people necessary -- but
3 we have assigned also total salaries and so on and
4 we came up with dollar in cost per acre per year,
5 you know, per season, per year. So this is what
6 you call the operation and maintenance costs.

7 THE SPECIAL MASTER: When you assigned those
8 operational costs per acre per year, did you dis-
9 tinguish between an acre of Class 1 from an acre of
10 Class 4 land?

11 THE WITNESS: We don't distinguish that. I
12 think all the sprinkler Class 4 lands have been
13 eliminated in our study.

14 THE SPECIAL MASTER: All sprinkler Class 4
15 lands and what?

16 THE WITNESS: Have been eliminated.

17 THE SPECIAL MASTER: Have been eliminated?

18 THE WITNESS: Yeah. We are not using them.
19 We are only considering above Class 4, Class 3,
20 Class 2, Class 1. Okay, so this is in a sense
21 what we are trying to do, we are assigning profes-
22 sional duty of people to operate the canal and the
23 pumps. That's what we are doing, really. After
24 that it's up to the farmer to manage his farm, and

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1 that cost has been taken care of by the economists.

2 Now, there are other costs in operation and
3 maintenance that haven't been addressed yet, and
4 those are the energy costs and demand costs.

5 The energy costs are the costs necessary to
6 pump out water to the sprinklers. That would de-
7 pend on how many kilowatts are consumed by each
8 pump station during the season. In order to do that,
9 we have to change the horsepower that I already dis-
10 cussed for each pump station to kilowatts, and that's
11 a simple method, we just multiply by .746 and we come
12 up to kilowatts. But the cost of energy is not the
13 only -- is not really in correct terms, but
14 is in a sense in some cases, but in kilowatt hours.
15 So we ought to know the hours necessary to pump out
16 water. So depending on the total flows that you
17 have and amount of flow that we pump out water, we
18 determine the number of hours necessary for each
19 pump station to pump out water during the season.

20 THE SPECIAL MASTER: How many pump stations
21 did you say in the whole project in the North Crow-
22 heart?

23 THE WITNESS: In North Crowheart we have 59
24 pump stations. However, all of them are not pumps.

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We have also areas where we -- where we serve areas without the pump just by gravity because there is enough head in those areas.

Okay, so based -- after we determined the kilowatts, we multiplied by the seasonal hours and we determined the kilowatt hours. And we received the cost of -- cost of energy per kilowatt hour from the USBR, which is .02521 dollars per kilowatt hour.

* * * * *

1 A Using that cost per kilowatt-hour, we plan
2 the cost per kilowatt hours. With the kilowatt
3 hours we determine the total energy cost of
4 each unit and then we divided that by the total
5 or what you call acreage, and we determined the
6 cost of energy per kilowatt hour per acre.
7 That's the energy.

8 The other item that we considered is also
9 the power cost or the demand cost or sometimes
10 they call it the hook-up cost.

11 THE SPECIAL MASTER: Proof-up cost?

12 THE WITNESS: Hook-up --

13 MR. CLEAR: Hook-up.

14 THE SPECIAL MASTER: Oh, hook-up.

15 THE WITNESS: Hook-up costs, h-o-o-k.

16 MR. WHITE: That's -- sorry.

17 A What that cost is -- the power company every
18 year it disconnects after the irrigation is
19 finished, it disconnects the power and then
20 when irrigation season comes up, it connects
21 the power. So there is cost for there and that
22 cost is based on the horse power of the pump
23 and that is \$7.75 per horse power.

24 So based on our horse power, whatever we

25 mesghinna-direct-clear

1 need for each pump take and multiply that by
2 \$7.75, we determine the cost, total cost, of
3 hook-up.

4 THE SPECIAL MASTER: That's a one-shot
5 cost per year, is it not?

6 THE WITNESS: Per year, yes, that is a
7 one-shot cost.

8 A We also determine on a per acre cost of that
9 one adding all the costs necessary and hook-up
10 costs, and we determined, as I said, the cost
11 per acre for power, or demand they call it also
12 for each of the units.

13 So in a sense we have three things in
14 operation and maintenance costs. The first,
15 operation and maintenance where we have all
16 the people who would operate the area; the
17 second is the energy cost; the third is the
18 power costs. We add those three and that gives
19 us the total operation and maintenance.

20 So this is cost per year, the other costs
21 we determined before are investment costs.
22 So -- when we talk of costs, these are the total
23 costs.

24 Q (By Mr. Clear) And that's also divided into a
25 mesgnhinna-direct-clear

1 per acre basis?

2 A That is also divided into per acre base. So
3 everything on per acre base is to make things
4 easier.

5 MR. CLEAR: Your Honor, I neglected to ask
6 for the introduction into evidence of United
7 States Exhibit WRIR C-256. That is the sub-
8 sistence drain -- or subsurface drain drawing
9 which Dr. Mesghinna used in his testimony
10 regarding the drainage system. I offer it,
11 for illustration of that would be helpful to
12 the Court and Counsel just to explain his
13 testimony.

14 THE SPECIAL MASTER: Right. Mr. White?

15 MR. WHITE: No objection.

16 THE SPECIAL MASTER: U.S. Exhibit WRIR
17 C-256 will be admitted into evidence and it
18 will be identified as a subsurface drain.
19 chart -- drawing of subsurface drain.

20 (Whereupon, U.S. Exhibit
21 (WRIR C-256 was hereby
(admitted into evidence.

22 Q (By Mr. Clear) Well, we have two items left:
23 Water duty and total cost. I was under the
24 impression that we really could determine water

25 mesghinna-direct-clear

1 duty once we got done with canals and related
2 structures. Do you have anything to add to
3 the last two items or --

4 A No. The thing -- what we have to do is, I
5 guess, before we enter into the water duty,
6 it is better to show all the five units, where
7 they are and what they are --

8 Q Um-hum.

9 A -- and so on.

10 THE SPECIAL MASTER: Okay.

11 A So that will be more practical, you know, we'll
12 see what we are talking.

13 THE SPECIAL MASTER: Should we set up the
14 five exhibits that we have to do that?

15 Does anybody want a few mintues of a
16 break here?

17 THE WITNESS: That would be good.

18 THE SPECIAL MASTER: All right. We will
19 take a five minute recess.

20 (At this time there was
21 (a brief recess had in
(the proceedings.

22 THE SPECIAL MASTER: Shall we come to order,
23 please, ladies and gentlemen?

24 All right. Mr. Clear?

25 mesghinna-direct-clear

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2 structures. Do you have anything to add to
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21 (a brief recess had in
(the proceedings.

22 THE SPECIAL MASTER: Shall we come to order,
23 please, ladies and gentlemen?

24 All right. Mr. Clear?

25 mesghinna-direct-clear

1 Q (By Mr. Clear) Dr. Mesghinna, before the
2 break you said you had finished basically
3 your eleven point outline of the methodology
4 used in testing these study problems and you
5 wish to go on and describe each individual
6 irrigation project for the five areas you're
7 testifying to?

8 THE SPECIAL MASTER: For the five units?

9 MR. CLEAR: Five units. I'm sorry, Your
10 Honor.

11 A Yeah, okay.

12 Q (By Mr. Clear) Would you like to begin?

13 A Sure, I can go ahead and --

14 MR. WHITE: Your Honor, may I get a
15 continuing objection to the witness testifying
16 from exhibits not in evidence and to the use
17 of the exhibits because of violation of the
18 ten-day rule.

19 THE SPECIAL MASTER: I recognize both
20 and will grant the continuing objection on
21 them.

22 Don't we have around here somewhere a
23 map of each of the -- maybe we don't -- go
24 ahead.

25 mesghinna-direct-clear

1 Q (By Mr. Clear) We have tacked on a piece of
2 hardboard two exhibits, U.S. Exhibit WRIR
3 C-249 and U.S. Exhibit WRIR C-257.

4 Can you briefly explain what those two
5 exhibits are, Dr. Mesghinna?

6 A Okay. First of all I would like to --

7 Q I think maybe you'll have to speak up because
8 your back is to Sandy a little --

9 A First. --

10 Q Mr. white.

11 A -- of all I would like to make a distinction
12 between these, between the two maps. This
13 one and this one (indicating) they are all
14 North Crowheart, but this one is the proposed
15 irrigation project, Conceptual Plan Irrigation
16 Project. It includes all the necessary things,
17 on-farm system, the pumps, the pipelines the
18 canals and related structures, and so on. But
19 it does not include drainage.

20 However, this one --

21 THE SPECIAL MASTER: Now looking at 257.

22 THE WITNESS: Um-hum.

23 A However this one which is 257, shows the drainage
24 system.

25 mesghinna-direct-clear

1 THE SPECIAL MASTER: And only the drainage
2 system?

3 THE WITNESS: And only the drainage
4 system.

5 A But in the fields that we have in here. It
6 does not mean that the canal is there and
7 pumps are also there and most of the things
8 are there (indicating several times).

9 THE SPECIAL MASTER: Um-hum.

10 A Okay. To begin with this is the North
11 Crowheart Unit, a portion of it, because there
12 is another one. The North Crowheart Unit,
13 you know, continues somewhere up here.

14 Q (By Mr. Clear) You're saying there is another
15 map for the North Crowheart map?

16 A Another plat depicts a portion of the North
17 Crowheart Unit. So as we have stated it earlier,
18 water is diverted from the North Crowheart Unit
19 from the Big Wind River.

20 THE SPECIAL MASTER: From the what?

21 THE WITNESS: Big Wind River.

22 THE SPECIAL MASTER: But where is it
23 between Cottonwood Canyon and where is that
24 diversion dam?

25 mesghinna-direct-clear

1 THE WITNESS: That is about two and a
2 half miles north of Crowheart. The Town of
3 Crowheart. It is at an elevation somewhere
4 5920 and 5910. It will be somewhere there.

5 MR. CLEAR: We have smaller copies of
6 those maps, if you want.

7 THE SPECIAL MASTER: No, that's all right.

8 MR. CLEAR: The large copies are back
9 there.

10 THE SPECIAL MASTER: Thank you.

11 A So all the water required for the whole North
12 Crowheart is diverted at this point (indicating).
13 The canal has several structures, as I have
14 said. For example, the Crow Creek, we have
15 a siphon about 600 feet long, and Dry Creek
16 we have another siphon about 600 feet long;
17 another very long siphon that we have is in
18 Five Mile Creek, when it crosses Five Mile
19 Creek, which is about 10,500 feet of siphon.

20 THE SPECIAL MASTER: You have no siphon
21 in the Mexican Draw?

22 THE WITNESS: We don't have. In those
23 areas we have culverts.

24 THE SPECIAL MASTER: Culverts?

25 mesghinna-direct-clear

1 THE WITNESS: Culverts, um-hum. So in the
2 rest of the area where there are small creeks
3 here and there, we used culverts. There are
4 also waste ways at Dry Creek, Five Mile Creek.

5 THE SPECIAL MASTER: What is a waste
6 way? An open drain?

7 THE WITNESS: Yes, it is an open channel.

8 THE SPECIAL MASTER: An open channel for
9 drainage or for delivery of water?

10 THE WITNESS: No. When there is a, say
11 for example there is a power shutoff, the pumps
12 will not be able to take the water, but the
13 water is flowing through the channel. If it
14 continues on flowing, then we will destroy --

15 THE SPECIAL MASTER: Oh, now I know.
16 You referred to them before.

17 THE WITNESS: Yes. So there are waste
18 ways because we have to allow cost for waste
19 ways in case of emergency.

20 However when the canal reaches somewhere
21 near Pavillion Ridge, this area in here
22 (indicating), we have the -- are at the division
23 box or division structure, because the canal
24 part deflects, part of the canal goes this

25 mesghinna-direct-clear

1 way and part of it continues to the other
2 portion of North Crowheart. That portion of
3 the canal that serves the Pavillion Ridge
4 area and some areas around it have also a
5 drop structure that would allow the flow of
6 water to go from a higher elevation to a lower
7 elevation.

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1 THE WITNESS: At the end of this canal of
2 this Pavillion Ridge Canal, the small canal we are
3 talking about, we can see at the end of the canal
4 where we have a pump, there is also a waste way
5 that we have allowed, and we have determined the
6 cost. We have determined the cost of the waste
7 way there. When I talk about the Pavillion Ridge
8 Canal, this is the small canal in here. It's
9 about, I believe, 7.2 miles in length. The other
10 portion of the canal is about 52 miles long, it
11 goes from -- all the way from -- 2 1/2 miles north
12 of Crowheart to the Pavillion Ridge area, which it
13 is about 52 miles long. And, as I have discussed
14 before this time, there are several pump stations.
15 And also there are turnouts, the turnouts are used
16 when we have enough head to supply it by gravity.
17 In some areas we also have booster bumps. We have
18 a section of an area which is very high compared
19 to the total area. Then we boost the water, and we
20 also made an allowance of cost of those pumps which
21 are needed in -- the booster pumps.

22 THE SPECIAL MASTER: That's not on the on-farm
23 system, that's along the canals before the on-farm
24 system?

25 mesghinna - direct - clear

1 THE WITNESS: Yes, before the on-farm system,
2 somewhere between the on-farm system and the pumps.
3 I mean, the main pump system there, there are these
4 booster pumps.

5 Then after each of the pump stations we see
6 the distribution lines that I was talking of or
7 transmission lines which are pipe line network that
8 we see in there (witness indicating). They are
9 shown by dotted lines. They are called irrigation
10 distribution pipelines. They are small dots. They
11 look like lines, but broken dots. Those are distri-
12 bution lines, and we haven't shown the on-farm pipe-
13 lines because it would be too crowded if we show the
14 on-farm pipelines, but it has been taken care of as
15 far as cost is concerned.

16 The other thing that we have considered is we
17 see there are -- in each pump station there are
18 numbers. For example, in the first pump station
19 there is 5.

20 THE SPECIAL MASTER: Point at that, will you?

21 THE WITNESS: Okay, here, 5. (Witness indicat-
22 ing). Okay, what it means is there is one pump
23 station there -- there is one pump station there,
24 but we are just suggesting since -- for the economics

25 mesghinna - direct - clear

1 of the farmer or of the farmers, they can use several
2 small pumps rather than one pump, big pump, because
3 there we have the cost for the big pump there. They
4 can use smaller pumps because, you know, when the
5 season is not too high, like, for example, in April
6 or May or September or some parts of June or August,
7 towards the end of August, they can use only a por-
8 tion of the pumps, so they can save energy costs and
9 so on. However, we have used the maximum what you
10 call horsepower or power costs. So the number there,
11 we are just suggesting this can be done this way.

12 One point I would like to make in the North
13 Crowheart area is there is -- there are two areas,
14 one here, which is Station No. 12 --

15 THE SPECIAL MASTER: Pump Station No. 4?

16 THE WITNESS: Twelve.

17 MR. CLEAR: Twelve?

18 THE WITNESS: It's not written there, but I
19 just remember it's Pump Station No. 12. Then up-
20 stream from it there is another pump station which
21 is Pump Station No. 13. These two pump stations
22 are served by a natural creek, which is a dry
23 creek, meaning that we divert water through -- we
24 are taking advantage of the creek, we divert water

25 mesghinna - direct - clear

1 out of Dry Creek and we let it flow down, then we
2 pump out water from Dry Creek.

3 Okay. See, in a sense, what we see is we are
4 looking at the overall -- the farms, as I have indi-
5 cated from yesterday, which are the on-farm systems
6 (witness indicating).

7 THE SPECIAL MASTER: Right where you are point-
8 ing now -- put that back up again. On some maps I
9 find a square mile it was omitted on being a Class
10 6 land, yet on all your maps I see it attached in
11 as part of the irrigable fee lands. It is a square
12 mile paralleling your irrigation distribution pipe-
13 line due north of Pump No. 5. Are you familiar at
14 all with a square mile in there that isn't even on
15 such exhibits as the map for the North Crowheart
16 land classification.

17 MR. ECHOHAWK: Is that the sprinkler map or
18 gravity map, Your Honor.

19 THE SPECIAL MASTER: This is the gravity land
20 classification map. And in it that whole square
21 mile is omitted, yet I notice all the planning here
22 is to irrigate it.

23 THE WITNESS: Which one is that? This one?
24 (Witness indicating). No, we are not irrigating

25 mesghinna - direct - clear

1 this area at all, sir. This is fee land.

2 THE SPECIAL MASTER: You are not planning on
3 irrigating that at all?

4 THE WITNESS: No, we are not planning to.

5 THE SPECIAL MASTER: That's a very important
6 answer and I appreciate it.

7 THE WITNESS: Yes.

8 MR. CLEAR: Explain what that is on the map.

9 THE WITNESS: I think it's better if I explain
10 it in the legend. We have a legend in here that
11 shows each and every line and sequence and so on.
12 The lines -- the bold lines, which are straight
13 lines, are irrigation system design boundaries,
14 which are farm boundaries. The big bold line with an
15 arrow in it is the main canal and the dotted lines
16 are the irrigation distribution pipelines.

17 THE SPECIAL MASTER: So all you do is run a
18 pipeline along that fee land, but you don't --

19 THE WITNESS: Yeah, but we are not doing any-
20 thing with it. We are not serving it and not claim-
21 ing it at all. And the vertical hatched lines are
22 the trust lands, and the square-like lines are the
23 fee lands. So those fee lands are just there to
24 show there are fee lands there. Other than that,

25 mesghinna - direct - clear

1 we have nothing to do with it. We are not claiming
2 water, we are not --

3 THE SPECIAL MASTER: Isn't there any cooperation
4 between owners of that fee land and you of possibly
5 putting water on it if it's irrigable and helping
6 share some of the costs? Is there no cooperation
7 in that way?

8 THE WITNESS: This is possible, but what we have
9 assumed, in that case, we have assumed the worst
10 case, meaning that suppose the people who have the
11 fee land don't want to share it.

12 THE SPECIAL MASTER: That follows -- that's the
13 usual batting average, but I'm sorry to hear it,
14 nevertheless.

15 THE WITNESS: So we are taking the maximum
16 precaution, meaning that we are taking the maximum
17 costs supplied ourselves. And if it comes that
18 later on we are willing to do it, the cost of the
19 system will decrease. So, in a sense, I think I
20 have shown as much as I could, unless there are
21 some clarifications that I have to make, this is
22 how the North Crowheart Unit is served.

23 Now, in North Crowheart we came up with
24 40,814, I believe, acres. But although we designed
25 mesghinna - direct - clear

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2 water, we are not --

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4 between owners of that fee land and you of possibly
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20 have shown as much as I could, unless there are
21 some clarifications that I have to make, this is
22 how the North Crowheart Unit is served.

23 Now, in North Crowheart we came up with
24 40,814, I believe, acres. But although we designed
25 mesghinna - direct - clear

1 the system for all these 40,814 acres, we decreased
2 it from the 40,814 acres by 5 percent. So from the
3 40,814 acres, we came up to net acres of 38,773
4 acres. The reason why we did this is there are --
5 there will be farmsteads, there will be some roads.
6 We might have included small, very small areas for
7 squaring off and so on and all these things, so we
8 have made an allowance of 5 percent.

9 THE SPECIAL MASTER: Give me that 38,000 again.

10 THE WITNESS: Yes, 38,773 acres.

11 THE SPECIAL MASTER: Okay.

12 THE WITNESS: We started our upper land, I
13 guess, about 48,000 and we went down at least 10,000
14 acres down from what we received from HKM.

15 So I think for the time being, this is enough
16 for North Crowheart proposed irrigation conceptual
17 plan, development plan.

18 The next thing that I would like to discuss in
19 the North Crowheart Unit is the drainage map, which
20 is C-257.

21

22

23

24

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1 A The bold lines that we see in the map with arrows
2 are the subsurface drainage or drains that have
3 been -- that I just talked an hour or half an
4 hour ago. And as we can see, the drains, they
5 collect the water from what you call the different
6 areas and then there could be a main drain that
7 collects that area and takes it out and what you
8 call discharges it to natural creeks or something
9 of the sort. Now, I think it is evident that
10 all the drains as we can see have different spacings
11 in many cases as you can see.

12 For example, just southeast of Crowheart
13 Butte we see the drains are very much crowded.

14 THE SPECIAL MASTER: Yeah.

15 A And the reason for that is that area has -- on
16 I'm sure Mr. Toedter has addressed this -- that
17 area has very shallow depths to barrier.

18 THE SPECIAL MASTER: Depths to barrier?

19 A Depths to barrier, and that makes it very expen-
20 sive and we can see, I believe, although I don't
21 exactly remember, it shows drains are every 150
22 feet.

23 THE SPECIAL MASTER: So you could classify
24 those as not practicably irrigable lands?

25 mesghinna-direct-clear

1 THE WITNESS: Well, I think the point is --

2 THE SPECIAL MASTER: I like that. The way
3 you get around --

4 THE WITNESS: The point is we are looking
5 for the whole project as such. You know, some
6 areas have few drains, some are unlucky because
7 of nature, have more drains. But when we take
8 the whole system, it comes practical.

9 So what this in correspondence is to what
10 Mr. Toedter showed the last few days that he
11 has different areas which have different classi-
12 fications as to hydraulic conductivity, depth to
13 barrier, and so on. So based on that we have
14 different drainage spacings.

15 Okay. So I think if I am going to talk
16 more, I will probably say things more and more
17 again. So for this time, I think this might
18 be enough.

19 THE SPECIAL MASTER: You think it might be
20 repetitive.

21 THE WITNESS: Yeah.

22 THE SPECIAL MASTER: All right. We appreci-
23 ate that. Does anyone know who owns that square
24 mile? Is that part of Mr. Gerald Spence's ranch or

25 mesghinna-direct-clear

1 Walt Urbigkit's?

2 MR. WHITE: I don't know, Your Honor.

3 MR. SACHSE: Off the record --

4 THE SPECIAL MASTER: Right. Let's go off
5 the record.

6 (At this time there was a
7 (brief discussion had off
8 (the record.

8 THE SPECIAL MASTER: Okay, back on the record.
9 I wondered, because there sits a square mile that
10 should share the costs of that area because he
11 will benefit from it. It's got the drainage right
12 there, the delivery canal paralleling the square
13 mile.

14 Okay, go ahead, Mr. Clear.

15 MR. CLEAR: I would like to consult with my
16 co-counsel.

17 (At this time there was a
18 (brief discussion had off
19 (the record.

19 MR. CLEAR: We are not going to run through
20 each one of these plats, but this one --

21 THE SPECIAL MASTER: No problem; no problem.

22 MR. WHITE: If it would speed things up any,
23 the State of Wyoming would stipulate that Dr.

24 Mesghinna's general remarks concerning 251 and 259

25 mesghinna-direct-clear

1 be accepted by the Court as applicable to preceding
2 exhibits at the same time.

3 MR. SACHSE: The tribes would not stipulate
4 to that, Your Honor, as to the Big Horn Flats
5 Exhibits, There are some particular issues with it.

6 THE SPECIAL MASTER: Fine, proceed.

7 Q (By Mr. Clear) I have hung up United States Ex-
8 hibit WRIR C-251 and WRIR C-259. Could you ex-
9 plain what those are?

10 THE SPECIAL MASTER: Just come around.

11 THE WITNESS: Okay.

12 (The witness approached the
13 easel.

14 A Probably this is the hardest one to explain. We
15 should have started when I had more energy with
16 this.

17 Okay. At any rate, this is the Big Horn
18 Flats, a portion of the Big Horn Flats Unit,
19 because there are about, I think, 968 acres down
20 south of this which are left.

21 THE SPECIAL MASTER: Both of these apply
22 to the Big Horn Flats area?

23 THE WITNESS: Yeah, yeah. Do you want me
24 to --

25 mesghinna-direct-clear

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21 THE SPECIAL MASTER: Both of these apply
22 to the Big Horn Flats area?

23 THE WITNESS: Yeah, yeah. Do you want me
24 to --

25 mesghinna-direct-clear

1

MR. CLEAR: Yes, go ahead.

2

THE SPECIAL MASTER: Okay.

3

Q (By Mr. Clear) Dr. Mesghinna, can you locate Big Horn Flats in -- it's about in this area here?

4

5

(Witness approached map of Arable Sprinkler Lands.

6

7

A Let me show you what is left. It's not too important.

8

9

What we have up there is all in this area here --

10

11

THE SPECIAL MASTER: Across the Big Horn -- or Wind River and south of it and south of the westerly portions of North Crowheart; is that correct?

12

13

14

15

THE WITNESS: Yeah, southern portions of North Crowheart. It is somehow in the center of the reservation. It is that high altitude area.

16

17

18

19

THE SPECIAL MASTER: Well, it's the western most area including Bull Lake?

20

21

THE WITNESS: Yeah, just southeast of Bull Lake.

22

23

THE SPECIAL MASTER: Okay.

24

THE WITNESS: But there are few acreages which I mesghinna-direct-clear

25

1 believe are 968 acres which are not shown in there.
2 They are in another place.

3 THE SPECIAL MASTER: Very well.

4 THE WITNESS: But they receive water from the
5 Little Wind.

6 THE SPECIAL MASTER: Very well.

7 MR. WHITE: Your Honor, with respect to these
8 two exhibits, C-252 and C-251, could we have a
9 continuing objection as to the witness testifying
10 from exhibits not in evidence --

11 THE SPECIAL MASTER: Yes.

12 MR. WHITE: -- and again the ten day rule.

13 THE SPECIAL MASTER: Yes.

14 THE WITNESS: Okay.

15 THE SPECIAL MASTER: Let me say something
16 at the risk of interrupting your thoughts. If
17 we're going to start holding trials as close as
18 we have in the last month and as we are antici-
19 pating, has the ten day rule become a nullity?
20 Shouldn't we reduce that to a five day rule by
21 common consent or by an order of this court?

22 MR. WHITE: I don't care what rule it is,
23 Your Honor, as long as it is enforced and applies

24 mesghinna-direct-clear

25

1 itself to all parties.

2 THE SPECIAL MASTER: You have to live with
3 it, too.

4 MR. WHITE: Maybe we ought to have a new
5 rule. That would be fine with us.

6 THE SPECIAL MASTER: Let's think about that
7 for the remainder. Let's go from ten to five
8 days for a month or two and see if it is agree-
9 able. I'll issue an order of that.

10 Make a note of that, Leo. Let's see if we
11 don't draft the propriety of an issuance of an
12 order relating to the ten day rule or the five
13 day rule to expedite this thing on notice of
14 that trial and treat all parties fairly.

15 All right. Proceed.

16 A Okay. When I discussed about Big Horn Flats,
17 I would like for simplicity sake and for the
18 sake of clarity -- for the sake of clarity, I
19 would like to divide my discussion into two, and
20 I will discuss on the first one.

21 The first one includes only 2,670 acres of
22 irrigable acres. Those 2,670 acres are located
23 on this one, is easier, or here, a portion of it
24 is here, a portion of it is here.

25 mesghinna-direct-clear

1 (Indicating several times.

2 THE SPECIAL MASTER: On the map.

3 A I am excluding this now for the time being. A
4 portion here, and a portion here, and the other
5 portion is one that I showed near Ethete --

6 THE SPECIAL MASTER: Down by the Big Horn
7 draw where it catches Ethete?

8 THE WITNESS: Yeah, that's the '968 acres.

9 Q (By Mr. Clear) When you're saying, "Here, here,
10 and here," that's hard to read in the record. Maybe
11 if you circled those -- let me go back --

12 THE SPECIAL MASTER: I don't know if that's --
13 Mr. White has seen them; we're all aware of what
14 they are.

15 Well, all right. They're being circled in
16 black.

17 A Circled in black, No. 1, and circled in black, No.
18 2.

19 THE SPECIAL MASTER: On 251.

20 A The rest 968 acres is near Ethete.

21 These acreages comprise -- these three different
22 areas comprise 2,678 acres. No canals on this.

23 We're just pumping water for No. 1 and No. 2 from

24 Big Wind and for the rest of the area near Ethete

25 mesghinna-direct-clear

1 from Little Wind. So all these areas comprise 2,670
 2 acres and we are claiming water for these 2,670
 3 acres.

4 Okay. And we have costs for this and we have
 5 water claim for this and it is in my summary
 6 report. And we have drainage plans for each of
 7 these areas that I just discussed, which are
 8 shown in Exhibit -- U.S. Exhibit WRIR C-259 and
 9 also in the area near Ethete. Okay?

10 THE SPECIAL MASTER: Let me interrupt you
 11 one more time.

12 THE WITNESS: Okay.

13 THE SPECIAL MASTER: Well, not yet. Go
 14 ahead; I'm sorry.

15 A Unless there is any other question concerning the
 16 specific three areas that I just discussed, I can
 17 go ahead and discuss about the rest of Big
 18 Horn Flats.

19 THE SPECIAL MASTER: Okay. All right, fine.

20 A Okay. The rest of Big Horn Flats, which is about
 21 probably 17 to 18 thousand, -- I can't remember exactly
 22 the acreage -- we are not claiming water now.

23 * * * * *

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 25 mesghinna-direct-clear

1 THE SPECIAL MASTER: You are not claiming any
2 water for the remaining 18,000 acres?

3 THE WITNESS: Yes.

4 THE SPECIAL MASTER: Why is that, is it because
5 most of the land is Class 3 and 4 anyway?

6 THE WITNESS: No, that's not the reason. I will
7 explain that reason in a little bit.

8 THE SPECIAL MASTER: All right.

9 THE WITNESS: Let me give a little short back-
10 ground information on this area (witness indicating).
11 Water can be supplied to this huge Big Horn Flats
12 from three sources. There is a possibility of three
13 sources. One of the sources that we see around here
14 that comes from the Little Wind River can supply
15 water to the Big Horn Flats. So this canal is start-
16 ing from the Little Wind River and comes all the way
17 to here (witness indicating) by gravity.

18 The other option to supply water to this area
19 is to divert water from Bull Lake, and when it
20 reaches near the back of Big Horn Flats, to pump it
21 to Big Horn Flats.

22 THE SPECIAL MASTER: That crosses Windchester
23 Draw and south of Windchester Butte?

24 THE WITNESS: It goes something like this
25 mesghinna - direct - clear

1 (witness indicating).

2 THE SPECIAL MASTER: Oh, it goes up north. I
3 see.

4 THE WITNESS: Yeah. Then it comes here, pro-
5 bably there would be a pump necessary in here to
6 pump out from that point.

7 The other alternative is to direct a pump from the
8 Big Wind to these areas (witness indicating). Okay,
9 so these are the three alternatives. Speaking of
10 engineering, it's possible to supply water to this
11 area, but when we first started to work on these
12 areas, we found out that the costs, the preliminary
13 costs, were a bit different from other costs, mean-
14 ing higher costs. Then we were advised to, you know,
15 leave it aside, and that's the reason that we have
16 not included it in our claim.

17 However, I would like to make it clear that
18 when it comes to engineering, this is possible to
19 supply water, there is no problem. It can be done.

20 THE SPECIAL MASTER: Costs are the factors
21 that --

22 THE WITNESS: Yes.

23 THE SPECIAL MASTER: -- warranted shutting
24 this to one side?

25 mesghinna - direct-clear

1 THE WITNESS: Yes. Probably the most viable
2 way, although this is not conclusive, viable way of
3 suppling water from this area would be from the
4 Little Wind, but the Little Wind does not have enough
5 water to supply this water (indicating), so we have
6 to, indeed, construct --

7 THE SPECIAL MASTER: A dam?

8 THE WITNESS: Yes, a dam.

9 THE SPECIAL MASTER: Has there been any feasi-
10 bility study at all of what dams can be constructed
11 on the upper reaches of the Little Wind to facilitate
12 this?

13 THE WITNESS: Yes. There has been some kind of
14 approximate studies.

15 THE SPECIAL MASTER: Are you familiar with them
16 or can you cite them for us?

17 THE WITNESS: Okay. I think I believe it is
18 in this Wind River water supply study (witness indi-
19 cating).

20 THE SPECIAL MASTER: Coming up in the material
21 -- all right. Can you identify the document you
22 are holding, just reference to it?

23 THE WITNESS: It could be in another, but I
24 could still find it. This is the Wind River Basin

25 mesghinna - direct - clear

1 Water Supply Study, U.S. Department of Interior,
2 Water and Power Resources Service.

3 THE SPECIAL MASTER: Does it have a number?

4 THE WITNESS: Preliminary field draft, June,
5 1980.

6 THE SPECIAL MASTER: Okay, I thank you for that.
7 I would like you to give me, if you can, Dr. Mesghinna,
8 a figure for -- and right now an answer to this ques-
9 tion of mine: With the costs of the construction of
10 pipe network and pumps and pumping stations and
11 canals and related work in the drainage of the Big
12 Horn area, were it not for the fact that it warranted
13 it being set aside now and it would be going ahead
14 and given the green light as a viable excellent area
15 with cost-benefit ratios, how much water per year
16 would be required to irrigate it? Can you answer
17 that?

18 THE WITNESS: Well, I can give it probably an
19 approximate figure because I haven't gone into a
20 detailed study on this. As I have stated it earlier,
21 we have got it down early in our studies.

22 THE SPECIAL MASTER: All right. If you could
23 define, and instead of giving me a ballpark figure,
24 bring your figure with some degree of certainty and

25 mesghinna - direct - clear

1 accuracy, I would appreciate an answer to this ques-
2 tion, and you can do it later if you wish, or I'm
3 sure it will be brought out on the State's side. If
4 it isn't, I'll bring it out, so we can leave that
5 for now and have it answered at a later date.

6 MR. WHITE: Your Honor, it will probably be
7 brought out by the Tribes.

8 MR. SACHSE: Your Honor, I can assure you on
9 the Tribes' cross-examination of the witness, we
10 intend to ask that question.

11 THE SPECIAL MASTER: I think it's appropriate
12 all of you know what I'm thinking and why I ask the
13 question. If the Tribes, because of costs, opt to
14 exclude this in one of their claims, there ought to
15 be some basis for a just formula to take water that
16 is south of the Big Horn River and credit it to an
17 area north of the Big Horn River that may not have
18 as fine right to water as this might have had had
19 it been more feasible. We will get into that a
20 little later, if necessary.

21 All right, go ahead, Dr. Clear -- or, Mr.
22 Clear. Go ahead, please.

23 MR. CLEAR: Your Honor, when he was talking
24 about Big Horn Flats, he mentioned the three areas

25 mesghinna - direct - clear

1 that the United States was claiming, and I think just
2 for the sake of the record, the third area was on
3 another map, U.S. Exhibit WRIR C-260 (sic), and I
4 would like him to circle the area and put a No. 3
5 on it so it will be --

6 THE SPECIAL MASTER: That's a circle with a "3"
7 in it on that one?

8 MR. CLEAR: Pardon?

9 THE SPECIAL MASTER: A circle with a "3" in it?

10 MR. CLEAR: Right.

11 (Off-the-record discussion.)

12 MR. CLEAR: I said U.S. Exhibit WRIR C-260. It
13 should be WRIR C-252.

14 Q (By Mr. Clear) Are you through with Big Horn Flats
15 now, Dr. Mesghinna?

16 A. Yeah, I'm through.

17 MR. CLEAR: Your Honor, could I have a short
18 break to talk? I think we are done in a certain
19 phase now and I would like to talk to him.

20 THE SPECIAL MASTER: Ten minutes or so? All
21 right.

22 (Whereupon a ten-minute recess
23 (was taken.)

24

25

* * * * *

1 THE SPECIAL MASTER: Okay, shall we come
2 to order, please?

3 Okay, Mr. Clear.

4 Q (By Mr. Clear) Now, Dr. Mesghinna, during
5 the testimony by the people from HKM, there
6 was substantial amount of discussion of the
7 parcel size of acreage limitation on the side
8 roll sprinkler systems on those arable lands.
9 How did you handle that in your irrigation
10 design system.

11 A Okay. When HKM made the land classifications,
12 they made two different land classifications.
13 One is for sprinkler irrigation, and specifically
14 for side roll irrigation system; and the other
15 is for gravity irrigation.

16 Okay. So in a sense there could be few
17 areas that are not irrigable by sprinkler or
18 not irrigable by, you know, gravity irrigation
19 or vice versa. However, there is one thing that
20 we have to see. Almost all irrigable lands
21 by gravity are irrigable by sprinkler.

22 But when HKM made the land classification,
23 they made it for side roll sprinklers, not for
24 sprinklers like hand move sprinklers. So they

25 mesghinna-direct-clear

1 made the limit -- a limit as to 40 acres of.
2 land by side roll is more feasible.

3 We stick to, that about 40 acres; we used
4 side roll. But those lands which could become
5 Class 6 lands in using sprinkler classification
6 can be Class 3 or Class 2 in surface irrigation.
7 But if we use hand move instead of side roll,
8 that will make it irrigable land; okay?

9 Q Um-hum.

10 A So we have taken it into account and we used
11 hand move sprinklers for fields which are less
12 than 40 acres, and we have made it that way.

13 I believe there is in their report, and I'm
14 not sure, a footnote that shows that indeed
15 that is true, what I am saying.

16 Q I am handing you Exhibit C-43 which is Land
17 Classification for North Crowheart Unit -- well
18 of all the units done by HKM and specifically
19 to a table called Arable Lands by Class.

20 A Okay. There is a footnote that I was referring
21 to. It is there, the one circled in that,
22 which says:

23 All gravity arable lands are all capable
24 of being irrigated by sprinkler methods and
25

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1 continuous hand move or side roll. . .

2 This is what I am saying, so anything
3 that has not been classified as sprinkler
4 irrigable is gravity irrigable, hand move.
5 So that's how we corrected the problem.

6 I would like to add a small thing in here.
7 There will be some areas even greater than 40
8 acres that will use hand move sprinkler, which
9 is still -- it is still okay. It doesn't
10 matter.

11 Q How many times have you visited the Wind River
12 Reservation in conjunction with designing
13 your projects here?

14 A Well, myself and with some other people who
15 worked under me have been three times there
16 and my people have also been there several
17 times. In fact, they are now there; I don't
18 know if they have left today back home.

19 At any rate, the first time I went
20 there, I visited the overall area, future lands
21 and also the historic lands, to acquaint myself
22 with the practice, with the irrigation practice
23 there, and to see what kind of crops grow,
24 what kind of facilities are there, and so on,

25 mesghinna-direct-clear

1 and to see the land in general, how it looks.

2 Also I went there to see how HKM were
3 doing their land classification, intake rate
4 tests, boring, classifying soil, and so on.

5 The second time I went there it was after
6 we received all the necessary data and after
7 we have put our, what you call fields on our
8 maps. Then I went actually there together with
9 my people to see every area, if we are right
10 indeed in putting the fields in according to
11 what we have put and that is to correspond our
12 office work with the fieldwork..

13 So as we have been there we have changed
14 our fields here and there, you know, because
15 something that you don't see in the plans you
16 can see also in the fields and so on and for
17 that reason I have been there and also have been
18 there to see the general route of the canals
19 and so on, and diversion structures.

20 The third time I went there was I think
21 last October and it was to see specifically
22 areas like diversion sturcture areas where it
23 is going to be specifically, which area and so
24 on, and to see the forms of the river and so on,

25 mesghinna-direct-clear

1 you know, if it would bring any problems or
2 something of this sort and also to see the
3 general area. Some fine points that you'll have
4 to make and to change, you know, some of our
5 fields here and there, you know, in squaring
6 off in all these things. However, also my
7 people have been there to see the historic lands
8 and also again after the States people put
9 black in some areas of our on-farm system, to
10 see and check indeed, if that is the case. So
11 we sent our people there and they have checked
12 that and came up with the final maps.

13 Q One last little thing on your plats here.
14 Could you step over to the table and just
15 identify for the record that these are your
16 plates?

(The witness complied.)

18 Q Let's see -- U.S. Exhibit WRIR C-252 --

19 A Yeah, this is WRIR 252, No. 3 of the Big Horn
20 Flats Unit, which has around 968 acres in it
21 and there are two pumping stations there just
22 near Ethete.

23 Q You don't have to explain what it is; we just
24 want you to identify these for the record.

25 mesghinna-direct-clear

1 A That is proposed irrigation project Big Horn
2 Flats.

3 The next one is U.S. WRIR C-260, the
4 drainage plans for proposed irrigation project
5 Big Horn Flats Unit.

6 U.S. Exhibit WRIR C-258 is drainage plan
7 for proposed irrigation project North Crowheart
8 Unit.

9 MR. CLEAR: Sorry, we had these a little
10 out of order, Your Honor.

11 THE SPECIAL MASTER: That's the northeast
12 corner?

13 THE WITNESS: Yeah, the last.

14 THE SPECIAL MASTER: All right.

15 A U.S. Exhibit WRIR C-261 is drainage plan for
16 proposed irrigation project South Crowheart
17 Unit.

18 U.S. Exhibit WRIR C-262 is drainage plan
19 for proposed irrigation project Arapahoe Unit.

20 U.S. Exhibit WRIR C-263 is drainage plan
21 for proposed irrigation project Riverton East
22 Unit.

23 U.S. Exhibit WRIR C-250 is proposed
24 irrigation project North Crowheart Unit.

25 mesghinna-direct-clear

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THE SPECIAL MASTER: What's that last exhibit?

MR. CLEAR: Two fifty, Your Honor. Proposed irrigation project North Crowheart.

THE WITNESS: That's the portion of North Crowheart Unit on the other side.

THE SPECIAL MASTER: Okay. That's all right.

A U.S. Exhibit WRIR C-253 is proposed irrigation project South Crowheart Unit.

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mesghinna-direct-clear

1 THE WITNESS: U.S. Exhibit WRIR C-204 is
2 Proposed Irrigation Project, Arapahoe Unit. U.S.
3 Exhibit WRIR C-255 is Proposed Irrigation Project,
4 Riverton East Unit.

5 THE SPECIAL MASTER: Are we going to go on
6 now, Mr. Clear, to -- Well, go ahead.

7 MR. CLEAR: Yeah. Let me take these down,
8 Your Honor. I think we are done with them. Are
9 you finished with these, Wold?

10 THE WITNESS: Yes.

11 Q (By Mr. Clear) Okay, Dr. Mesghinna. We went
12 through your 11-step program and you have explained
13 to me and the Court the irrigation and drainage
14 systems that you have devised for the five areas.
15 I think it's time now we go through and plug in
16 the numbers there and advise the Court of the costs
17 and the water duty that you found. How would you
18 like to approach this, go through evapotranspiration
19 and -- well, would you give us your figures on the
20 development figures?

21 MR. WHITE: Your Honor, I believe that in order
22 to shorten the time, since all of Mr. -- or Dr. Mes-
23 ghinna's figures that I'm aware of appear in his re-
24 port, we would stipulate the figures he would testify

25 mesghinna - direct - clear

1 about with respect to those areas that appear in the
2 report.

3 THE SPECIAL MASTER: Is the report about to be
4 offered into evidence?

5 MR. CLEAR: I will offer it into evidence; then
6 if they will stipulate --

7 MR. WHITE: We are not going to stipulate to
8 their accuracy.

9 MR. CLEAR: Of course not.

10 MR. WHITE: We will stipulate that, if asked,
11 he would answer the same figures as in the report.

12 THE SPECIAL MASTER: The same figures as in the
13 report for each of the units?

14 THE WITNESS: Yes.

15 THE SPECIAL MASTER: That's fine as long as
16 you don't give us a big tough hassle when introduced
17 into evidence.

18 MR. WHITE: Well, I'll give a little hassle,
19 but --

20 THE SPECIAL MASTER: We would like two copies
21 of that, if you can.

22 Q (By Mr. Clear) Dr. Mesghinna, I'm going to hand you
23 what has been marked for identification as U.S.
24 Exhibit WRIR C-256.

25 mesghinna - direct - clear

1 A. Yes.

2 Q. Are you familiar with that?

3 A. Yes, I'm familiar with that.

4 MR. SACHSE: Your Honor, I think I need to
5 make the record clear on this. The Tribes are
6 willing to join in that stipulation except as to
7 Big Horn Flats. The testimony that Dr. Mesghinna
8 has already given shows that in terms of engineer-
9 ing, he considered a great deal more acres as
10 feasible in Big Horn Flats than are shown in the
11 report. The report makes no mention of these ad-
12 ditional acres except through the map in the back
13 of the report which corresponds to WRIR C-- which-
14 ever number it is.

15 THE SPECIAL MASTER: To which it applies?

16 MR. SACHSE: Right. So the Tribes, when the
17 report is actually entered into evidence, may well
18 object to the pages of the report that have to do
19 with Big Horn Flats.

20 THE SPECIAL MASTER: The objection is noted.

21 Q. (By Mr. Clear) You are familiar with this report?

22 A. Yes, I'm familiar.

23 Q. Does this report represent what your testimony
24 would be as to the cost and the total water duty

25 mesghinna - direct - clear

1 on the five projects you have testified to?

2 A. Yes.

3 MR. CLEAR: Your Honor, I will offer into
4 evidence now U.S. Exhibit C-245, which is --

5 THE SPECIAL MASTER: Can we have two copies,
6 one for the official court record and one for our
7 purposes in working?

8 MR. CLEAR: Yes.

9 MR. WHITE: Why don't you go ahead and offer
10 the maps at the same time and get it all over with?

11 MR. CLEAR: Well, then, Your Honor, I would
12 also offer -- well, we have just offered 245, the
13 report. We also offer U.S. Exhibit WRIR C-249, the
14 North Crowheart Unit Conceptual Irrigation Develop-
15 ment Plan; 250, the North Crowheart Unit Conceptual
16 Irrigation Development Plan --

17 THE SPECIAL MASTER: What was the one before
18 250?

19 MR. CLEAR: I'm sorry, there are two North
20 Crowhearts. 249 will be North Crowheart Conceptual
21 Irrigation Plan, Plate 4; 250, North Crowheart Unit
22 Conceptual Irrigation Development Plan, Plate 5;
23 251, Big Horn Flats Unit Conceptual Irrigation De-
24 velopment Plan, Plate 6 -- those numbers are found

25 mesghinna - direct - clear

1 in the corner of the --
2 THE SPECIAL MASTER: All right.
3 MR. CLEAR: 252, Big Horn Flats Unit Conceptual
4 Irrigation Development Plan, Plate 7; 253,
5 South Crowheart Unit Conceptual Irrigation Plan,
6 Plate 8; 254, Arapahoe Unit Conceptual Irrigation
7 Development Plan, Plate 9, 255, Riverton East Unit
8 Conceptual Irrigation Development Plan, Plate
9 10; 257, Drainage Plan, Proposed Irrigation Pro-
10 ject, North Crowheart Unit, and I believe that
11 would be marked Plate 4D; 258, the Drainage Plan
12 for the Proposed Irrigation Project, North Crow-
13 heart Unit, and that would be marked Plate 5D;
14 U.S. Exhibit WRIR C-259, Drainage Plan for Proposed
15 Irrigation Project, Big Horn Flats, which would
16 also be called Plate 6D --

17 THE SPECIAL MASTER: 6D?

18 MR. CLEAR: 6D, for drainage. They parallel
19 the irrigation plans.

20 260, Drainage Plan for Proposed Irrigation Pro-
21 ject, Big Horn Flats, 7D.

22 THE SPECIAL MASTER: All right.

23 MR. CLEAR: 261, Drainage Plan for Proposed
24 Irrigation Project, South Crowheart Unit, which

25 mesghinna - direct - clear

1 would be Plate 8D; 262, Drainage Plan for Proposed
2 Irrigation Project, Arapahoe Unit, which would be
3 9D; 263, Drainage Plan for Proposed Irrigation Pro-
4 ject, Riverton East Unit, which would also be called
5 Plate 10D.

6 THE SPECIAL MASTER: 10D, all right. That con-
7 cludes the offer of this evidence.

8 Mr. White?

9 MR. WHITE: Just a very few questions, Your
10 Honor. Could I use the podium, please?

11 MR. CLEAR: Yes.

12 THE SPECIAL MASTER: These are questions deal-
13 ing with these exhibits, Dr. Mesghinna.

14 THE WITNESS: Okay.

15 MR. WHITE: I'm sorry?

16 THE SPECIAL MASTER: I just said these will
17 be questions dealing with the exhibits.

18 MR. SACHSE: Your Honor, I'm happy to have Mr.
19 White go first on his voir dire, but I want the
20 Court to note the Tribes also wish to voir dire.

21 MR. WHITE: I'll take maybe five minutes,
22 There will be plenty of time for Mr. Sachse.

23 THE SPECIAL MASTER: Fine.

24 MR. WHITE: Your Honor, I don't think I will
25 need to voir dire, I think I can just make my

1 objection for the record.

2 I would object to the admission of the exhibits
3 just offered on several grounds: First, there has
4 been no foundation established for the fact that the
5 lands shown as irrigable lands, fee, are, in fact, fee
6 lands, and we know, in fact, we have had four fee
7 lands. So if they were admitted -- or the offer were
8 amended to exclude the offer of the fee lands' anno-
9 tations on the map, that would remove that particular
10 objection.

11 Secondly, the maps contain a legend of the ir-
12 rigable trust and irrigable lands fee. And, as this
13 witness has indicated, he has covered two of the
14 bases on the way to going from irrigable -- he's
15 covered only one of the two bases on the way from
16 going from arable to irrigable. He's covered the
17 engineering, but not the economics. It's quite pre-
18 mature to call these irrigable. As the Court ruled
19 in the Boundaries and Dates trial for the Wyoming
20 exhibits, if these were simply annotated to show
21 allegedly irrigable lands, we would have no problem
22 there.

23 The same thing is true in the report. Many
24 places in the report the lands are described as
25 irrigable, having only gone through the engineering

1 and not the economic evaluation. If the report
2 were amended to show that the lands were allegedly
3 irrigable, again, we would have no problem.

4 Finally, we would object to all of the exhi-
5 bits save two of the maps, one for Big Horn Flats
6 and one for Riverton East, on the basis of the 10-
7 day rule. The maps and the original copy of the
8 report were furnished to the State on Monday, which
9 wouldn't even meet the 5-day rule. Several replace-
10 ment pages to the report were submitted yesterday
11 to the State, which is far beneath the 10-day rule.
12 And we have to state to the Court, however, two of
13 the maps, one dealing with Big Horn Flats and one
14 Riverton East, had no changes from those received
15 in January. There were, however, a total of 72
16 changes among the various fields shown on those
17 maps. And that's the basis of our objection, Your
18 Honor.

19 THE SPECIAL MASTER: All right. Let me deal
20 with the objections.

21 MR. CLEAR: Your Honor, I think we talked about
22 the fee lands and sticking in allegedly irrigable
23 lands; we can state on the record that's fine with
24 us.

25 THE SPECIAL MASTER: Also, we know a little bit

1 more about what we are doing now than we did at the
2 time of the boundaries and dates thing, and it was
3 good we made the notations that we did at the time.
4 The figure here as irrigable land presumes that the
5 second tested maps before the acre charge per acre
6 could be assessed, because if some of the acres are
7 knocked out as being irrigable on Dr. Mesghinna's
8 plan, then costs will be elevated in direct relation
9 to the number of acres that will be excluded from
10 his overall costs, and it may not end up being that
11 big.

12 MR. WHITE: That's the point I want to measure,
13 Your Honor.

14 THE SPECIAL MASTER: We have it in the record,
15 and it's good it's made in the record. So all of
16 these are admitted.

17 MR. SACHSE: Your Honor --

18 MR. WHITE: I think Mr. Sachse wanted to voir
19 dire.

20 MR. SACHSE: I haven't had a chance to voir
21 dire before you rule.

22 THE SPECIAL MASTER: I'm not going to rule.
23 When and if the Court admits these into evidence,
24 it will be on the expressed condition the maps,
25 except as you noted, Mr. White, the figures of

1 irrigable acres are modified by the limitations
2 thereto that were just made by Mr. White in his
3 objections.

4 MR. WHITE: The two maps I'm referring to did
5 not go to the question of whether it was irrigable
6 or not; that was the question of the 10-day rule.

7 THE SPECIAL MASTER: That's right. Go ahead,
8 Mr. Sachse.

9 MR. SACHSE: I may have a few questions.

10 VOIR DIRE EXAMINATION

11 BY MR. SACHSE:

12 Q Dr. Mesghinna, on Page 42 of your report you list
13 the net acreage for each of the five units, that you
14 have included in your irrigation plan. If you will
15 turn first to the North Crowheart where you have
16 the net acreage as 38,773, were any acres excluded
17 on the advice of the economists and for economic
18 reasons rather than engineering reasons?

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1 A All the ranges that have been excluded are
2 due to economic reasons.

3 THE SPECIAL MASTER: Are due to economics?

4 THE WITNESS: Yeah. It's not engineering.
5 Engineering you can reach Stagner Ridge without
6 any problem.

7 Q (By Mr. Sachse) Is the same true for South
8 Crowheart, Arapahoe, Riverton East and Big
9 Horn Flats?

10 A Yeah, most of the areas are like that. You
11 know, we can supply water to anyplace you
12 want as long as -- I mean it's the cost that
13 prohibits it in the final analysis.

14 MR. SACHSE: With that understanding
15 Your Honor, that there -- and I'll bring this
16 out further on cross-examination -- but for
17 this voir dire with the understanding that the
18 acreages listed here would be larger except
19 for some acreages included on the advice on --
20 the advice of the economists and were not
21 excluded for any engineering reason, we have
22 no objection to the admission of the exhibit.

23 THE SPECIAL MASTER: We will take it that
24 it meets some of the tests of the second and
25 mesghinna-voir dire-sachse

1 not all but some.

2 All right, I'm ready to rule on these,
3 if anybody else is not to be heard or wishes
4 not to be heard. I will rule as follows on the
5 exhibits just offered by Mr. Clear, and described
6 by him at the end of each number, so we can use
7 that in our report index:

8 Beginning with U.S. WRIR C-245, which is
9 entitled The Report of Dr. Mesghinna Regarding
10 Conceptual Irrigation Development Plans and
11 Irrigation Water Requirements for the WRIR of
12 Wyoming, No. WRIR C-245, 249, C-250, 251, 252,
13 253, 255, 257, 258, 259, 260 and 261, 262, 263,
14 are hereby admitted into evidence and -- Leo,
15 you have any questions? You have your
16 descriptions?

17 MR. SALAZAR: Fine.

18 THE SPECIAL MASTER: Okay.

19 (Whereupon, U.S. Exhibits
20 (WRIR C-245, 249, 250, 252,
21 (253, 255, 257, 258, 259,
22 (260, 261, 262 and 263 are
(hereby admitted into
evidence.)

23 MR. CLEAR: You did go through 245 to
24 263. I have it and Mr. Echohawk does not.

25 mesghinna-voir dire-sachse

1 THE SPECIAL MASTER: Oh, yes. The ones
2 I repeated just now. I have only one break.
3 I don't know what 256 is, but it is not in
4 evidence, so --

5 MR. SALAZAR: It's that one right here.
6 We did that one quite a long time ago.

7 THE SPECIAL MASTER: Oh, yes. That was admitted,
8 long time ago. Thank you, Leo.

9 DIRECT EXAMINATION (CONTINUED)

10 BY MR. CLEAR:

11 Q There appears to be some confusion as to what
12 I asked. Dr. Mesghinna, does your report,
13 WRIR C-245, contain your professional opinion
14 as to the cost and water duty of the five
15 projects you testified to here?

16 A Yes.

17 Q Thank you.

18 MR. CLEAR: I have no further questions,
19 for Dr. Mesghinna, Your Honor.

20 It's ten to twelve, Your Honor, Should we --

21 THE SPECIAL MASTER: Yes, it is. I would
22 like to ask a question or two about what is
23 called diversion requirement in acre feet.

24 THE WITNESS: Okay.

25 mesghinna-direct-clear

1 THE SPECIAL MASTER: Is this in effect
2 a total diversion of 209,000 acre feet to
3 sustain everything you testified to?

4 THE WITNESS: Yes, for the 3,760 acres
5 we need 209,372 acre feet of water per year
6 per season.

7 I would like to make a --

8 THE SPECIAL MASTER: I'd like you to make
9 an observation.

10 THE WITNESS: Do you have a calculator?

11 THE SPECIAL MASTER: That's more water
12 than flows in the river, isn't it?

13 MR. ECHOHAWK: No. Oh, no.

14 MR. WHITE: About half more, Your Honor --

15 THE WITNESS: Okay. This total diversion
16 that we see in here which is 209,372 acre
17 feet seems to be big, much, but if we compare
18 it with the kinds of diversion requirements of
19 water duty in the whole Reservation, this is
20 quite very low. The water duty in the
21 Reservation runs from anywhere ten acre feet
22 per acre to about five acre feet per acre, but
23 this diversion that we have given here for
24 water duty is only 3.9 acre feet per acre.

25 mesghinna- the special master-

1 THE SPECIAL MASTER: 3.9 acre feet per
2 acre?

3 THE WITNESS: Yes. So the reason why we
4 have made it in such a very efficient way is
5 because we have designed it in such a way we
6 have high efficiency using sprinkler irrigation
7 all over and then pipe networks to carry water
8 to that. We eliminate all losses between the
9 pump station and what you call the on-farm,
10 and on-farm also we use sprinkler system in
11 order to make it very efficient.

12 So this 3.9 acre feet, which is approximately
13 the water duty of the overall 54 -- 53,760 acres
14 is quite low as compared to what is going out
15 right now.

16 THE SPECIAL MASTER: Table 24 gives a
17 summary of costs as well as acreage and
18 diversion.

19 THE WITNESS: Yes.

20 THE SPECIAL MASTER: At the bottom I see
21 acreages and diversions. Where are the costs
22 on Table 24?

23 THE WITNESS: Yes, on Table 24 there is
24 the first column says, description --

25 mesghinna-tne special master.

1 THE SPECIAL MASTER: Yes.

2 THE WITNESS: On the left side corner,
3 and continues if we continue that row it
4 gives us the five different units.

5 THE SPECIAL MASTER: I see, and you broke
6 that down per acre?

7 THE WITNESS: And I broke that down per
8 acre and then I added first on-farm system,
9 then pipe network followed by pump and pumping,
10 and then canals and related structures, then
11 drainage and then included engineering and
12 contingencies. That would mean we have included
13 25 percent of the cost, of the total cost of
14 pipe network, pumps, canals and drainage.

15 THE SPECIAL MASTER: Yes.

16 THE WITNESS: And we have added, for
17 example, North Crowheart \$345 per acre, and
18 then we added all that and get total investment
19 of --

20 THE SPECIAL MASTER: You add your total
21 cost of operation to give you 2149 more per
22 acre?

23 THE WITNESS: Okay, not quite that. The
24 total investment is a one-time cost. It's 1,837

25 mesghinna-the special master

1 per acre, but those total operation costs --
2 those costs come every year.

3 THE SPECIAL MASTER: I see now. If you
4 take total investment costs per acre on
5 53,000 acres, you're punching there with the
6 computer, you're 53,760 acres --

7 THE WITNESS: Okay. I think you are
8 looking for the investment cost.

9 THE SPECIAL MASTER: I'm looking for the
10 bad news at the bottom line.

11 THE WITNESS: Let's take North Crowheart,
12 37,768 acres, with 53,760, because the costs
13 of the other units are different from North
14 Crowheart --

15 THE SPECIAL MASTER: So you just averaged
16 your total investment per acre, have you?

17 THE WITNESS: Yeah, so if we have to find
18 the total costs for North Crowheart alone, it
19 will be 1,876 times 1,038 would be 38,773,
20 which would -- comes to 71.2 million dollars.

21 THE SPECIAL MASTER: For North Crowheart
22 alone?

23 THE WITNESS: Yes. That is the investment
24 cost.

25 mesghinna-the special master

1 THE SPECIAL MASTER: Now, can you help.
2 us determine the value of an acre foot of
3 water when money is needed to -- please strike
4 that. We're getting into a different field.

5 Let's go on. If the 71 million dollars
6 is the total first shot investment cost for
7 North Crowheart system, what is it for South
8 Crowheart? It will be more, won't it?

9 THE WITNESS: No, it will be much lower.

10 THE SPECIAL MASTER: I beg your pardon?

11 THE WITNESS: That will be 9.5 million
12 dollars.

13 THE SPECIAL MASTER: Nine and a half million.
14 What would it be for Arapahoe?

15 THE WITNESS: That will be 7.73 million
16 dollars.

17 THE SPECIAL MASTER: Are these 1981 dollars?

18 THE WITNESS: No, these are 1979. All
19 costs are 1979, indexed on to 1979.

20 THE SPECIAL MASTER: What is the total
21 cost of the total investment cost of Riverton
22 East?

23 THE WITNESS: Okay. 7.65 million dollars.

24 THE SPECIAL MASTER: And for Big Horn Flats.

25 mesghinna-the special master

1 THE WITNESS: 5.52 million dollars.

2 THE SPECIAL MASTER: All right. Thank
3 you very, very much, Dr. Mesghinna.

4 Yes, Mr. White.

5 MR. WHITE: A few short things before
6 we adjourn, which I assume that is the next
7 order of business.

8 First, Your Honor, I wanted to advise
9 the United States that cross-examination of
10 Dr. Mesghinna may be, and I'm emphasizing
11 may be, quite short; probably half a day.

12 THE SPECIAL MASTER: That would be
13 beautiful.

14 MR. WHITE: It could be as long as a
15 couple of weeks.

16 THE SPECIAL MASTER: We hope for the first
17 and dread the last.

18 MR. WHITE: There are several things that
19 we could do to shorten it. I believe that
20 Dr. Mesghinna has some sort of a numbering
21 convention where he numbers all his fields.
22 That way we could refer to the fields by
23 number.

24 If he does have that, if he could share it

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mesghinna-the special master

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with us, things would move quite quickly.

* * * * *

1 MR. WHITE: The second thing is that we did
2 not have all of the facts and data upon which Dr.
3 Mesghinna based his decision for all his fields;
4 and instead of having to go through them field by
5 field and pulling material out of his voluminous
6 notebooks, if he could provide us his facts and
7 data and calculations which are included in those
8 notebooks to us, then it would cut things down
9 quite a ways.

10 Finally, if the United States would stipulate
11 that the deposition which Dr. Mesghinna gave in
12 January, or the transcript of that deposition,
13 could be admitted in evidence with the stipulation
14 were he to testify now to the same questions he
15 would give the same answers; if we could do those
16 three things, numbering system, facts and data out
17 of the notebook and the transcript of the deposition,
18 I think we are well on our way to speeding --

19 THE SPECIAL MASTER: I assume there is no pro-
20 blem on the first two. Shall we discuss the third?

21 MR. CLEAR: Your Honor, this is again getting
22 back to the old -- I imagine the numbering system
23 is no problem.

24 THE SPECIAL MASTER: Number one, we're okay.
25 How about No. 2?

1 MR. CLEAR: Let's ask the witness, it's his
2 property.

3 Is there any problem with you giving the num-
4 bering system to each field?

5 THE WITNESS: Okay, I can give them --
6 That will take a lot of time to copy.

7 MR. WHITE: We can make a Xerox copy of it.

8 THE WITNESS: Let me show you how it looks.
9 Do you want me to show you?

10 MR. WHITE: Yeah, let's see it, Wold.

11 THE SPECIAL MASTER: It would help in the cross-
12 examination. It would be good to have a look at what
13 we are talking about.

14 MR. WHITE: Otherwise, Your Honor, it's going
15 to be an awful mess. Your Honor, why don't you
16 take a look at this book.

17 MR. CLEAR: I think it's helpful to see some
18 of the problems we are running into.

19 THE SPECIAL MASTER: I was hoping to avoid
20 them. I don't know if I can make a contribution
21 to resolving them. I'll come down and have a look.

22 MR. WHITE: Well, you have to rule on this.

23 THE SPECIAL MASTER: Let's go off the record
24 for just a minute.

25 (Off-the-record discussion)

1 (while counsel and the Special
2 (Master are conferring with the
(witness.

3 THE SPECIAL MASTER: Mr. White has just informed
4 me he will take a month on cross-examination of Dr.
5 Mesghinna. I'm hereby serving notice that I will
6 not permit a month; I will not permit a week of
7 cross-examination. Mr. White said he could do it
8 in as little as half an hour with given stipulations,
9 and there were three of those. Two of the three have
10 been already met, and they're in the process of get-
11 ting the information for the third --

12 MR. CLEAR: Well, Your Honor --

13 MR. WHITE: I don't think that's right.

14 MR. ECHOHAWK: I don't think that's right
15 because under the rules if we are going to turn
16 over all this information --

17 THE SPECIAL MASTER: You are.

18 MR. ECHOHAWK: -- I believe we are entitled
19 to fees and expenses for Dr. Mesghinna's --

20 THE SPECIAL MASTER: I don't want to get into
21 fees and expenses now. I don't want to get into
22 that. I want the scheduled procedures now. We
23 worry about fees and expenses afterwards when you
24 can move for the payment of them, enter that ac-
25 cordingly at that time.

1 I want now to let the record show that the
2 witness and the United States, more accurately,
3 has agreed to allow a copy to Mr. White and the
4 State that is marked clearly by Dr. Mesghinna
5 which shows the numbers of each field, and in addi-
6 tion thereto, the holes upon which there was a re-
7 liance for the cross-section data from earlier wit-
8 nesses upon which Dr. Mesghinna relied.

9 THE WITNESS: And the pump stations are also
10 numbered.

11 THE SPECIAL MASTER: The pump stations are
12 numbered, and Dr. Mesghinna has agreed to allow
13 copying of the pages from his workbook dealing
14 with costs of the pipe and costs for the canals
15 and the costs of the --

16 THE WITNESS: Pumping stations.

17 THE SPECIAL MASTER: -- pumping stations.

18 THE WITNESS: Wait, the canals, I have not yet
19 agreed.

20 MR. CLEAR: He has not agreed to the canals
21 yet.

22 THE WITNESS: What I can do, when I go home,
23 I have to call them and give them each costs of the
24 canal. I don't have the details of it. I didn't
25 expect to go through cross-examination this time.

1 THE SPECIAL MASTER: Of course not.

2 MR. CLEAR: Are the canals involved in your
3 computer program at all?

4 THE WITNESS: All the costs are done in terms
5 of -- by hand.

6 THE SPECIAL MASTER: We hope this will solve
7 some of your problems, Mr. White. I know it hasn't
8 solved them all. How about the third point, is
9 there any possible agreement on the admission into
10 evidence on the deposition of January?

11 MR. CLEAR: I don't think so, Your Honor. I
12 read this once, and I'm not sure I want to proceed
13 in that manner. There have been changes in opin-
14 ions -- or details.

15 THE SPECIAL MASTER: Can't those changes and
16 opinions be recognized, modified in the balance of --

17 MR. CLEAR: Your Honor, this is a very long
18 deposition, it went from Tuesday morning, 9:00, to
19 Saturday morning, and I'm not about to stipulate
20 everything he said in there will be what he would
21 have said now if the same questions are answered,
22 but there may be portions we can work out.

23 THE SPECIAL MASTER: Why would you be so re-
24 luctant to let Dr. Mesghinna's statements of three
25 short months ago go into the record today?

1 MR. CLEAR: There are several things. At depo-
2 sitions you make certain stipulations ahead of time
3 that the lawyers -- for instance, when the State is
4 taking a deposition, the lawyers for the Government
5 don't make certain objections because he has wider
6 latitude in a deposition than he does on cross-
7 examination in a trial. Your Honor, there is a
8 point -- there are certain types of depositions.
9 There are discovery depositions, which is just to
10 find out information. There are also depositions
11 you take in preparation for a Motion for Summary
12 Judgment. Now, if I felt that Mr. White at the
13 time he was taking Dr. Mesghinna's deposition in
14 January -- and now we are in the case at that point
15 -- were to use that deposition to be introduced at
16 trial or to be used basically in a Summary Judgment
17 Motion, I at that time would have asked Dr. Mesghinna
18 questions to get information from him favorable to
19 its position.

20 Now, I am not willing at this time to allow
21 those depositions to be used in place of cross-
22 examination.

23 MR. WHITE: Your Honor, that's the problem.
24 We had a long deposition which I thought we could
25 move in and avoid a lot of cross-examination,

1 but the deposition just sort of lays the groundwork.
2 If you allow me a week on him, all I'm going to do
3 is get the groundwork laid.

4 THE SPECIAL MASTER: Dr. Mesghinna?

5 THE WITNESS: The groundwork, really, I have
6 done it over the last one and a half days, more or
7 less. But there has been several changes after the
8 deposition, you know, and I don't see the deposition
9 will be of much of a help really for any one of us.

10 MR. CLEAR: I think --

11 THE SPECIAL MASTER: Just a minute, please.

12 You don't think the introduction of the deposi-
13 tion will be of much help to any of us?

14 THE WITNESS: I don't think so. That's the
15 reason I went into quite detail on this matter so
16 that everybody would be informed on what I'm saying.
17 It would be clear on the minds of everyone. And,
18 as long as we get rid of this, the groundwork and
19 pumps and plus do something with the canals, I think
20 you're all set. I don't see any reason you have to
21 go beyond that.

22 THE SPECIAL MASTER: In your opinion you would
23 think they have all the information they need from
24 your work papers and from your testimony to ask what
25 questions they wish to ask?

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MR. WHITE: I'm glad he knows, Your Honor,
what questions I'm going to ask.

MR. MEMBRINO: His direct examination laid
out what his conclusions are.

MR. CLEAR: What Mr. White is asking us to
stipulate to is something that he wants me to sti-
pulate as to what Dr. Mesghinna will say. I think
it's up to Dr. Mesghinna to --

* * * * *

1 MR. WHITE: The point is, Dr. Mesghinna
2 has had a chance to review the transcripts and to
3 make any changes he wanted to. If there have been
4 any changes since then, the United States should
5 state that. I think this is something you cannot
6 order; I think this is something they can agree to
7 do. Their failure to agree points up the problem.

8 THE SPECIAL MASTER: In conclusion I
9 thank all of you gentlemen for the contributions
10 made toward trying to solve our problems we may
11 have on your cross-examination. It is now well after
12 noon, and I am going to adjourn these proceedings
13 now until we meet again on the next scheduled day.

14
15 (WHEREUPON, the proceedings
16 (recessed at approximately
17 (12:12 p.m.

18 * * * * *

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REPORTERS' CERTIFICATE


1
2 State of Wyoming)
3 County of Laramie) : SS

4 We, Mary Nelson and Monika Fleischli, Regis-
5 tered and Certified Shorthand Reporters and Notaries
6 Public, hereby certify that we did at the time, date and
7 place, as set forth, report the proceedings had before
8 the Honorable Teno Roncalio, Special Master, Presiding,
9 in stenotype; that the foregoing pages, numbered 4199-
10 4341, inclusive, constitute a true, correct and complete
11 transcript of our stenographic notes as reduced to type-
12 written form under our direction.

13 We further certify that we are not agents,
14 attorneys or counsel to any of the parties hereto, nor
15 are we interested in the outcome thereof.

16 Dated this 24th day of April, 1981.

17
18 
19 MARY NELSON
20 Registered Professional
21 Reporter

22 
23 MONIKA FLEISCHLI
24 Certified Shorthand
25 Reporter

