

5-6-1981

## Trial Transcript, Vol. 52, Afternoon Session

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File # 159

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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 )  
WYOMING. )

Civil No. 4993

FILED \_\_\_\_\_  
5/20 1981  
*Margaret V. Hampton* CLERK  
DEPUTY

VOLUME 52  
Afternoon Session  
Wednesday, May 6, 1981

**ORIGINAL**

1 THE SPECIAL MASTER: Please come to order.

2 MR. CLEAR: Go ahead.

3 Q (By Mr. White) Dr. Mesghinna, during your  
4 direct testimony you discussed messic and  
5 frigid soils. Do you recall that discussion?

6 A Yes, I recall that discussion, sir.

7 Q What effect does frigid soil have on cropping --  
8 excuse me, on crop consumptive use?

9 A It doesn't have a direct relationship. It  
10 doesn't have a direct relationship.

11 When we talk of frigid and messic soils,  
12 when we talk in terms of those parameters we  
13 are talking in terms of ground temperature.  
14 But as you might know, as you know,  
15 evapotranspiration is an ambience rather than  
16 ground temperature. The effects that it will  
17 have is during your planting time, because  
18 when you plant your soil it should have  
19 certain temperature in order for the plant to  
20 grow. So the temperature has to be at some  
21 temperature -- I mean the ground temperature  
22 has to be above a certain temperature, that  
23 varies for different crops.

24 Q So the irrigation requirement would be affected  
25 mesghinna-cross- white

1 by the date of planting then; is that correct?

2 A Yeah, because if we assume, let's take for  
3 example any crop, let's take corn. If you  
4 plant corn when the temperature is quite low  
5 your consumptive use will be quite low, but  
6 the corn may not grow to the maximum point.  
7 So it has some effects although it is not --  
8 I can't say it is directly related to --  
9 because what I am trying to bring about is  
10 the ambient temperature has some effects on  
11 ground temperature, you know, it's a function  
12 of it, really. I mean if you have a hot  
13 season, the ground temperature will be hotter --  
14 I mean warmer, although that is not one to one.

15 Q Are you saying then that frigid soil might  
16 affect yield or patterns or crop adaptability  
17 but not necessarily irrigation requirement?

18 A Let me say it this way: Frigid soils have  
19 shorter growing seasons than mesic soils.  
20 I think that will answer the question.  
21  
22

23 \* \* \* \* \*

24  
25 mesghinna-cross-white



1 Q What use, if any, did you make of available data  
2 concerning the location and extent of frigid and  
3 messic soils within the Wind River Indian Reserva-  
4 tion in establishing your growing season?

5 A If you remember, I have delineated part of my cli-  
6 matic zone in terms of the information between area  
7 -- the area between Lander and Riverton. Those --  
8 that straight line across through there.

9 Q The straight line?

10 A I have delineated that area.

11 Q What facts and data did you discover --

12 A Okay.

13 Q -- within the -- concerning the Wind River Indian  
14 Reservation concerning frigid and messic soils?

15 A Okay, what they tell you in that data is messic  
16 soils have over 120 days of growing season, and  
17 the frigid soils - you can correct me here if I  
18 am wrong in the figure - have a growing season  
19 between 90 and 120 days. Okay. And when we  
20 adapt the crop adaptability, we have taken this  
21 into consideration.

22 Q From what source did you obtain the data that you  
23 utilized concerning frigid and messic soils?

24 A As I've indicated, the source of the data is the  
25 mesghinna - cross - white

1 Soil Conservation Service, and I can get it all --  
2 the whole publication, if necessary.

3 Q Could I look at that, please, to make sure we are  
4 thinking about the same thing?

5 A Of course.

6 In fact, it is not very far.

7 Q Okay, the document you're referring to is entitled  
8 "Irrigable Soils of Wyoming" prepared by the Wyo-  
9 ming Water Planning Program of the State Engineer's  
10 office in cooperation with the State Department of  
11 Agriculture, 1974?

12 A Yes.

13 Q Is that the most current data which you used --

14 A Well, this is only a small part of what I have used.  
15 This is additional data, really.

16 Q -- with respect to frigid and messic soils?

17 A I don't work -- I haven't worked really on frigid  
18 and messic soils, but I have used this one in con-  
19 nection of the developing my climatic zone map.  
20 The straight lines that I have mentioned have  
21 been taken from this and the map is here. By  
22 the way, I have the map that shows where the  
23 frigid soils are and where the messic soils are.

24 Q Could I see your map, please?

25 mesghinna - cross - white

1 A Of course, sir.

2 The Wind River Indian Reservation is shown in  
3 orange and the lines that divide the messic and the  
4 frigid soils is on the blue line.

5 Q Is this a map out of the Water Planning Report that  
6 you have just referred to?

7 A Yeah, I think it is from that map -- from that pub-  
8 lication.

9 Q Is it true that that map is vintage 1974 or 1975?

10 A Well, it has to be if the publication is 1974.

11 Q Did you use any data based on field investigations  
12 made by the Soil Conservation Service in the years  
13 1979, '80, '81?

14 A No, I haven't used.

15 Q Okay.

16 A Again, there shouldn't be any misunderstanding with  
17 our climatic zone map. That shows only the -- it  
18 is terms of ambient temperature.

19 Q Yes, I understand.

20 A Yes.

21 Q But for that one boundary you did use frigid and  
22 messic soils, is that right?

23 A It helped in putting -- it was an additional factor,  
24 as I have stated in my direct testimony. We

25 mesghinna - cross - white



1 considered several things, of which this one was a  
2 small additional tool, making up our climatic zone  
3 map.

4 Q Who provided that information to you, your map and  
5 the report, was that HKM?

6 A I think, yeah, it was through HKM.

7 Q Wold, let's take a look at Table 12, Page 15 of  
8 your report, your canal conveyance efficiencies.

9 THE SPECIAL MASTER: Would you ask the question  
10 again, please? I'm sorry.

11 MR. WHITE: I would direct his attention to  
12 Table 12, Page 15 of his report, Your Honor.

13 THE WITNESS: Page 16?

14 MR. WHITE: I have it on Page 15 of mine.

15 THE WITNESS: Okay. Yeah.

16 Q (By Mr. White) Okay, I would like to make sure I  
17 understand what the table means. You indicate  
18 there that the conveyance efficiency for the North  
19 Crowheart Canal is 77 percent in July, is that cor-  
20 rect?

21 A Yes, sir.

22 Q Does that mean that 23 percent of the water diverted  
23 through that canal in July is lost, doesn't arrive  
24 at the pumps?

25 mesghinna - cross - white

1 A. Yeah, it is being lost through several things, of  
2 which the two important things are seepage and  
3 operational waste.

4 Q And isn't it true that you told me that your diver-  
5 sionstthrough that canal during July were roughly  
6 750 c.f.s.?

7 A. Yes, roughly about 750 c.f.s., that is a design  
8 more or less. It's --

9 Q All right.

10 A. Go ahead.

11 Q And if you divert 750 c.f.s. during July, isn't it  
12 true that your 23 percent conveyance loss amounts  
13 to around 10,700 acre-feet?

14 THE WITNESS: How -- Could I ask you to say  
15 that question --

16 THE SPECIAL MASTER: I think the answer is  
17 obvious. We can all compute it.

18 THE WITNESS: Okay.

19 Q (By Mr.White) You compute it by multiplying 750  
20 times .23 times 1.98 times 31, is that correct?

21 A. Something of that sort.

22

23

24

\* \* \* \* \*

25

1 Q (By Mr. White) Isn't it true that your canals  
2 are unlined canals?

3 A Sure, I have indicated it in the report.

4 Q Isn't it true that those conveyance losses  
5 would be significantly decreased if you lined  
6 your canals?

7 A Well, they will be decreased obviously because  
8 you have a lined canal.

9 Q Right. And if you decreased your conveyance  
10 losses, isn't it true that you could decrease  
11 your diversions as well?

12 A Of course.

13 Q Why didn't you?

14 A Decrease your efficiency?

15 Q No, decrease your diversions, your headgates.

16 A Oh, okay. If you decrease your conveyance  
17 you'll decrease your diversions.

18 THE SPECIAL MASTER: Why don't you ask  
19 him --

20 MR. WHITE: I wasn't quite sure.

21 Q (By Mr. White) You decrease your --

22 A You decrease --

23 Q I think we understand one another. If you  
24 lined your canals, you wouldn't have to

25 mesghinna-cross-white

1 divert so much water; is that correct?

2 A That's exactly true, sir.

3 Q Next question is why didn't you line your  
4 canals?

5 A When you plan a project you plan for certain  
6 things, you have certain criterias, you have  
7 certain limitations, of which the most  
8 important factor is financial limitation. And  
9 if you -- In this project what we have done is  
10 instead of gravity irrigation we have used  
11 sprinkler irrigation for this amount of water,  
12 one, whereas in many projects they use gravity  
13 irrigation and if the deficiency is low the  
14 irrigation will be high.

15 The second part is the distribution  
16 efficiency between the canal and the fields  
17 or between the pumps and the fields, and we  
18 have made that all closed pipes. Okay.

19 So the only thing -- So in there I  
20 would like to add we have increased the  
21 efficiency to 95 percent there rather than  
22 using subcanals in what you call laterals  
23 that would give a lot of losses of water. So  
24 the only thing which is the shortest distance  
25 mesghinna-cross-white



1 of all the things that I was talking, like  
 2 if you talk about distribution or transmission  
 3 lines it will be probably thousands -- I  
 4 mean hundreds of miles if you add just North  
 5 Crowheart. But we have only 57 miles of  
 6 canals which is uncanaled.

7 Q Unlined?

8 A I mean unlined. So we cannot, you know, we  
 9 cannot see everything, we have to see also the  
 10 costs.

11 Q But isn't it true that based on the information  
 12 shown on Table 12, if you lined your canals,  
 13 depending on the month and depending on the  
 14 canal, your headgate diversions would be between  
 15 23 percent and 40 percent less than you have  
 16 designed them for?

17 A Well, you always have operational waste.

18 Q Well, let's drop it from, let's say, take five  
 19 percent.

20 A It will be --

21 Q Eighteen percent to 35 percent.

22 A Why don't I tell you this: The efficiency will  
 23 increase and that's what I said, but that one  
 24 we have already taken care, you know, by using

25 mesghinna-cross-white



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19 percent.

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22 A Why don't I tell you this: The efficiency will  
23 increase and that's what I said, but that one  
24 we have already taken care, you know, by using

25 mesghinna-cross-white

1 pipelines and so on. You know, if we decrease  
2 in one area we are increased in two areas,  
3 that's what I am trying --

4 Q Are you saying then you did not plan for lined  
5 canals because of financial constraints?

6 A That is one of it, yeah, because you cannot  
7 line -- you cannot make everything completely  
8 resistant of everything, you know.

9 If, you see, for example, the project  
10 near us, Midvale Irrigation Project, you know  
11 you see all kinds of losses there due to  
12 canals and laterals and so on here and there.  
13 We have substantially increased from that  
14 project, for example, when we are designing  
15 this project.

16 Q Is it true then that if you lined your canals  
17 the project might not be financially feasible?

18 A No, I am not saying that. That is the  
19 assumption that we have taken.

20 Q That's the assumption you've made?

21 A No, no, no.

22 Q Well, start again.

23 A What I am saying is we say that the best way to  
24 conserve water is by trying to make everything

25 mesghinna- cross-white

1 as much as it can, I would say, as much as  
2 we can to decrease the losses of water. Why  
3 don't you compare, this is easy to compare,  
4 let's see the Midvale Irrigation District,  
5 okay?

6 THE SPECIAL MASTER: Does Midvale have  
7 lined canals?

8 THE WITNESS: No, they don't have. Some  
9 of it is lined, some of it is not.

10 THE SPECIAL MASTER: Do they have pipes in  
11 their system?

12 THE WITNESS: No.

13 THE SPECIAL MASTER: Open ditches?

14 THE WITNESS: Mainly open ditches.

15 THE SPECIAL MASTER: Okay, go ahead.

16 THE WITNESS: Let's compare, see.

17 Where will you find nowadays with -- I'm  
18 really serious about this -- with 3.8 acre-  
19 feet per acre for such big projects? We have  
20 only about 3.8 acre-feet per acre in this  
21 project while the Midvale Irrigation District  
22 is over five acre-feet per acre, you know. So  
23 this has been, you know, substantially decreased,  
24 the water duty, by using sprinklers and

25 mesghinna-cross-white

1 and transmission lines, pipelines.

2 So I mean this is a good comparison,  
3 really, you know, without going too far  
4 around discussion.

5 Q (By Mr. White) Isn't it true that the Midvale  
6 Project was constructed some time ago?

7 A Oh, yes.

8 Q Isn't it true that if the project or the Bureau  
9 project were constructed today it would have  
10 lined canals?

11 A I don't know, I wouldn't say that. Maybe,  
12 probably. I think they -- they are lining  
13 their canals recently due to water limitations  
14 and so on, but they still have also what you  
15 call open ditch as their laterals and so on.

16 Q Dr. Mesghinna, I hand you what's been marked  
17 for identification as Plaintiff's Exhibit  
18 FM-9, which is an excerpt from the Bureau manual  
19 which I'm sure you recognize. Well, I better  
20 ask you. You recognize that excerpt, don't  
21 you?

22 A Sure.

23 Q And I direct your attention to the canal lining  
24 policy at the bottom of the page. Do you find

25 mesghinna-cross-white



1 that?

2 A Yeah.

3 Q Isn't it true that under that policy full  
4 justification for using an unlined water  
5 way can be required?

6 A Let me read it.

7 Q Go ahead, read it.

8 THE SPECIAL MASTER: I'd say that's only  
9 half of a sentence that you read to him, Mr.  
10 White. In those instances where the  
11 recommendations do not call for lining of pipe,  
12 then what you said is correct.

13 THE WITNESS: Yeah, I have read this, Mr.  
14 White.

15 Q (By Mr. White) Okay. And over in the next  
16 page, the top paragraph, second page of that  
17 exhibit discusses that justification; isn't  
18 that correct?

19 A They are saying justification for using unlined  
20 waterways is sometimes very complicated  
21 because of the large number of factors to  
22 be considered.

23 Q And then it says: Consideration must be given  
24 to seepage rates with and without lining. Is  
25 mesghinna-cross-white



1 that correct?

2 A Yes.

3 Q And then it goes on but let's stop there for  
4 a moment.

5 A Okay.

6 Q What consideration did you give the seepage  
7 rates with and without lining?

8 MR. CLEAR: I think he's gone into his  
9 justification for all of this.

10 THE SPECIAL MASTER: I object to the  
11 question. The Witness may be asked what  
12 considerations he made to determine to build --  
13 or what pipe to put in, what considerations  
14 did he consider in putting in unlined canals  
15 rather than lined canals, those questions are  
16 permissible.

17 MR. CLEAR: I think he's already asked  
18 and answered that.

19 MR. WHITE: Was his objection sustained  
20 or --

21 THE SPECIAL MASTER: I sustained the  
22 objection.

23 THE WITNESS: I can answer the question,  
24 you know, this is one of the strong points we

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have. So why don't I make it clear on --

MR. WHITE: You should cordinate with  
your lawyers on that.

THE WITNESS: This is -- we can settle  
the matter very easily.

\* \* \* \* \*

mesghinna-cross-white

1 A Let me start this way. Before we design our system,  
 2 we study the historic conditions in the area. We  
 3 know that -- we found out in Historic Federal  
 4 Indian Project Lands the diversion requirements  
 5 are high, above five acre feet per acre.  
 6 Secondly, then we see the other projects outside  
 7 of the BIA -- I mean outside of the Federal  
 8 Indian Project Lands and those are -- the one  
 9 which is the most important and biggest one that  
 10 can be compared with our project is the Midvale  
 11 Irrigation District. From there we found out  
 12 that the diversion requirement is also higher  
 13 on the average if you take the last probably  
 14 10, 15 years. it would be, you know, those data,  
 15 it would be above five acre feet per acre.

16 Okay. So, we have these things in mind  
 17 now. Then we see, we try to consider our new  
 18 projects. We have the project, what do we ask  
 19 ourselves? One of the most important things  
 20 to do now-a-days whether it is in America or  
 21 somewhere else in the world especially in arid  
 22 regions of the world we have to conserve water.  
 23 How can we conserve water? As you said, one of  
 24 the ways of considering --

25 mesghinna-cross-white

1 Q Conserving?

2 A -- conserving water is by lining a canal. What  
3 are the other ways? By using sprinklers rather  
4 than gravity irrigation you can substantially  
5 increase your efficiency and decrease your diver-  
6 sion requirements.

7 What is the second? The second thing is  
8 the transmission lines that go from the canal to  
9 each of the fields. Those -- we said, okay, it  
10 will be hundreds of miles of these canals so let  
11 us line these meaning that let us use conduits,  
12 pipelines for this.

13 So the shortest thing, the shortest distance  
14 compared with all of these things is the canal.  
15 Then we said, okay, we can leave the canal unlined  
16 but we line everything else. So what did we come  
17 up with? We come up with the substantially lower  
18 diversion requirement as compared to adjacent  
19 projects in the area so this was the consideration.

20 THE SPECIAL MASTER: So instead of five and  
21 a half acre feet per acre, you have computed your  
22 projects at what?

23 THE WITNESS: At about 3.9, I guess, at the  
24 most.

25 mesghinna-cross-white



1 Q (By Mr. White) Isn't it true that the Midvale  
2 Project District continues to line their canals?

3 A Yes. Of course, because the canal is getting old  
4 and as it gets older you have to maintain it better.

5 Q What will the duties of water be if you know once  
6 they have their canals lined?

7 A I wouldn't know that.

8 Q Isn't true that Midvale is generally a gravity  
9 system?

10 A Yes.

11 Q And isn't it true that Midvale has very few sprink-  
12 lers in it?

13 A Sure, I know that.

14 Q Are you suggesting, Dr. Mesghinna, that the net  
15 depletion to a stream using sprinklers is less  
16 than using some sort of gravity system or flood  
17 irrigation?

18 A Depletion means so many things for me. Would you  
19 clarify that?

20 Q Diversions minus return flows.

21 THE SPECIAL MASTER: Savings.

22 A I would say that the deep percolation from sprinklers  
23 is lower than gravity irrigation in general.

24 Q Which means what with respect to net depletion?

25 mesghinna-cross-white



1 A You mean depletion, the amount of water that re-  
2 turns to the rivers?

3 Q The net depletion to the stream as a result of  
4 the irrigation activity.

5 A Well, what it means is if all the water returns  
6 to the streams, you will have --

7 Q Would be zero depletion?

8 A No, no, no. There is no such zero depletion.

9 Q Well --

10 A I don't think there is any zero depletion --

11 Q You said if all the water is returned to the  
12 stream. There was diversion, I assume that's  
13 what you meant, that's zero depletion, isn't  
14 it?

15 A No, what I'm saying is if I divert a certain  
16 amount of water and part of it is consumed by  
17 the plant and part of it goes to deep perco-  
18 lation and then goes back to the streams, that's  
19 the point -- that's the amount of water that I'm  
20 talking about, the amount of water that returns  
21 to the streams, return flow. I'm talking of  
22 return flow.

23 Q I'm sorry.

24 A I'm talking of return flow.

25 mesghinna-cross-white

1 Q Okay.

2 A So, gravity systems would have, I believe, just  
3 from the outset would have higher return flows  
4 than gravity -- I mean than sprinkler.

5 Q Would have greater return?

6 A The very fact that you're using less water in  
7 sprinklers, you know, as compared to gravity.

8 Q Isn't it true, Dr. Mesghinna, that if you did  
9 line the canals you would enjoy a further con-  
10 servation of water, some 50 to 70,000 acre feet  
11 a year?

12 A Well, let me --

13 Q Or do you know?

14 A Let me tell you something. Even if I use pipe  
15 instead of the canal, closed pipe for conveyance  
16 instead of a canal I would conserve even more  
17 than what you're saying, you know, so it is rela-  
18 tive.

19 THE SPECIAL MASTER: So you are saying it  
20 is all relative?

21 THE WITNESS: Yeah, it is all relative.  
22 Because the more you make your project gold  
23 plated the more water savings you will make.  
24 That's obvious.

25 mesghinna-cross-white

1 THE SPECIAL MASTER: Do you think that the  
 2 logical thing in years that would follow successful  
 3 launching of these projects that these canals  
 4 perhaps ought to be lined?

5 THE WITNESS: Well, what I'm trying to say  
 6 is we have to make some kind of a compromise.  
 7 Which part do we line? Do we line the canals or  
 8 the distribution system? Or should we change it  
 9 to gravity system?

10 THE SPECIAL MASTER: We appreciate that. You  
 11 have made your options here and you have explained  
 12 why.

13 THE WITNESS: Yes, uh-huh.

14 THE SPECIAL MASTER: And you have taken and  
 15 elected the route you have shown, hundreds of miles  
 16 of pipe whereas you have the short, relatively  
 17 short canal. But as a matter of fact I was won-  
 18 dering if this canal after five or ten years of  
 19 operation ought to begin to have sections of it  
 20 lined during the nonirrigating season as part of  
 21 good operation and maintenance.

22 THE WITNESS: Yes, this is part of it, you  
 23 know, in fact, we have what we call -- although  
 24 you haven't reached that point I guess so far in

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1 the cross examination, we have what we call the  
2 engineering and contingencies. And we have the  
3 contingencies for something like this, you know,  
4 when you find something unexpected when you find  
5 something that probably you have to line your  
6 canal and so on.

7 You have those contingencies and so on. So  
8 everything is taken care in our plans.

9 Q (By Mr. White) Is it your opinion then, Dr.  
10 Mesghinna, that the cost or the dollar values  
11 given for engineering in contingencies is adequate  
12 to cover not only the engineering and contingencies  
13 which you and I have discussed on previous occa-  
14 sions but also the lining of canals?

15 A No, no, no. No, I think you misunderstood me.

16 THE SPECIAL MASTER: I'm not sure that he  
17 misunderstood you at all. I think he knows per-  
18 fectly well what you said, if I may say so. You  
19 go ahead and answer his question.

20 A Okay. What I'm saying is suppose in the route  
21 of the canal we find, let's say, a big hole in  
22 the route, sinks. What do we do? We have to  
23 line the canal there so the contingencies are  
24 for something of this sort, unexpected things.

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1 What we might have overseen. That's the reason  
2 we have -- otherwise, it is not assigned specifically  
3 for lining the canal.

4 Q Isn't it true then, Dr. Mesghinna, that the cost  
5 values given in table 24 on page 42 of your report  
6 do not include the costs for lining the canals at  
7 any time in the future except if you should happen  
8 to run into what you referred to as something like  
9 a sink?

10 A Well, I think it is clear. This canal is unlined  
11 canal and the costs are for unlined canal.

12 Q Now, let me get back to the question I asked some  
13 time ago and isn't it true that if you lined these  
14 canals, you would enjoy a further conservation  
15 of water of between 50 and 70,000 acre-feet per  
16 year?

17 MR. SACHSE: Objection.

18 THE SPECIAL MASTER: For these five projects?

19 MR. WHITE: Yes, sir.

20 MR. SACHSE: He's asked this question about  
21 three times --

22 MR. WHITE: I have never gotten the answer.

23 THE SPECIAL MASTER: He has asked it once and  
24 he got an answer, and I think I'll sustain the objection.

25 mesghinna-cross-white



1 MR. WHITE: Your Honor --

2 THE SPECIAL MASTER: You asked that question  
3 and you got your answer.

4 MR. WHITE: Could I have that answer read  
5 back because I believe that he didn't indicate  
6 whether that was true, untrue, or he didn't know.

7 MR. SACHSE: Your Honor, the witness answered  
8 the first time that there would be a savings in  
9 water loss if the canal was lined. He declined  
10 to give an exact number of acre feet and there is  
11 no reason why he should off the top of his head  
12 give one, and if Mr. White has a number of acre  
13 feet that would be saved that he wants to try to  
14 prove later in the case, he can do it through  
15 his own witnesses.

16 MR. WHITE: Well, I think I ought to be  
17 given at least the opportunity of that answer  
18 being read back because I don't believe that Mr.  
19 Sachse has correctly characterized it.

20 THE SPECIAL MASTER: Well, I think he did  
21 but I'll let you read it back but I think it is  
22 wasteful, extreme waste of time.

23 Can you find it, Lamont?

24 (Brief pause.)

25 mesghinna-cross-white

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THE SPECIAL MASTER: Go ahead and answer the question.  
A You see, if you line a canal doesn't mean that you escape from seepage by the way. There is always seepage in canals, the joints and so on. At any rate if we are very successful in lining a canal, I don't think we'll save more than 30,000 acre feet.

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mesghinna-cross-white

1 Q (By Mr. White) Okay. Now, Dr. Mesghinna,  
2 I hand you what has been previously admitted  
3 or copies of what have previously been  
4 admitted as C-231, 235 -- we're back to  
5 drainage -- and ask you if those are the  
6 Toedter maps which you relied upon in developing  
7 your drainage costs based on drain depths --  
8 excuse me, drain spacing, size, and length,  
9 which are in turn based in part on depth  
10 to barrier?

11 A Yeah, these are the maps, I believe.

12 (Brief pause.

13 THE SPECIAL MASTER: The hearing that  
14 was set for three o'clock, this morning has  
15 just been reset in Judge Kerr's Courtroom  
16 so we don't have to move at three o'clock.

17 Q (By Mr. White) Dr. Mesghinna, I direct your  
18 attention to one of those Toedter maps, which  
19 is a copy of what has already been admitted  
20 as Exhibit C-234, and ask you whether or not  
21 your Field 9-20 in the Arapahoe Unit falls  
22 within study area A-1 on Exhibit C-234?

23 A Yes, it is, A1-A1-2.1-20 is Field 920.

24 Q And 20 means that the depth to barrier that  
25 mesghinna-cross-white

1 you assume for that field was 20 feet?

2 A Uh-huh.

3 Q Is it true that you relied on the HKM data  
4 with respect to depth to barrier?

5 A Yes.

6 Q Is it reasonable to rely, of a person of your  
7 expertise, on that sort of data in determining  
8 depth to barrier?

9 A Why not?

10 Q Well, let's see.

11 (Brief pause.)

12 Q Dr. Mesghinna, I hand you what's been marked  
13 for identification as Plaintiff's Exhibit  
14 FM-10, and tell you that it is a copy of  
15 materials provided to the State of Wyoming  
16 through discovery by the United States, and  
17 ask you if it isn't true that drainage Hole  
18 No. 32 on that plate which lies within your  
19 Field 9-20 shows in its log a depth of 1.5  
20 feet to shale?

21 THE SPECIAL MASTER: Depth of how much?

22 MR. WHITE: 1.5 feet, Your Honor. One  
23 and a half feet.

24 THE SPECIAL MASTER: Can you tell where  
25 mesghinna-cross-white



1 that hole is on this exhibit, please, or just  
2 describe it by --

3 MR. WHITE: It's right there, Your Honor.

4 THE SPECIAL MASTER: Thirty-two?

5 MR. WHITE: Yes, sir.

6 THE SPECIAL MASTER: All right.

7 MR. CLEAR: Your Honor, I think we've been  
8 through the depth to barrier.

9 THE SPECIAL MASTER: We have indeed, but  
10 he has a right to test this Witness on his  
11 use of this material, and I'll let a few  
12 questions be asked.

13 MR. WHITE: The purpose of questioning --

14 THE SPECIAL MASTER: You've been over-  
15 ruled, Mr. White.

16 You may answer.

17 THE WITNESS: Where that is, I haven't  
18 found it.

19 (Brief pause.)

20 Q (By Mr. White) Okay. Have you now located  
21 Hole No. 32 on FM-10?

22 A Yeah, it is on line A, and I have to try to  
23 locate the boring that corresponds to it.

24 This map is not really very clear.

25 mesghinna-cross-white

1 Q Isn't it true that No. 32, the D with the 32  
2 in it, which you circled on FM-10 is within  
3 the boundaries of Field No. 9-20 in the  
4 Arapahoe Unit?

5 A Let me check.

6 Q Okay. While you're looking, you might want to  
7 check E, which is immediately --

8 THE SPECIAL MASTER: One at a time would  
9 be a good idea.

10 MR. WHITE: I'm sorry.

11 THE WITNESS: Although it is very hard to  
12 exactly pinpoint the place from these maps,  
13 it is approximately somewhere there.

14 Q (By Mr. White) Isn't it true that on the  
15 second page of FM-10, the log for Hole D-32  
16 shows sandy brown shale, one and a half feet  
17 to nine feet?

18 THE SPECIAL MASTER: When you say "Sandy  
19 brown shale" --

20 MR. WHITE: Yes, sir.

21 THE SPECIAL MASTER: I can't read it.

22 MR. WHITE: These are the best copies we  
23 got from the United States, Your Honor. I can  
24 show you my copy, which is clearer.

25 mesghinna-cross-white

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THE SPECIAL MASTER: That's all right.  
We've been at it an hour now, let's take a  
five minute break, a little recess.

(Thereupon a five  
(minute recess was taken.

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mesghinna-cross-white

1 MR. SACHSE: May it please the Court. Before  
2 the witness answers --

3 THE SPECIAL MASTER: Well, are we -- I haven't  
4 rapped in yet.

5 We are now resuming the hearing.

6 MR. SACHSE: May it please the Court. Before  
7 the witness answers, it seems obvious to me at this  
8 point that this was an improper question and the  
9 witness should not be permitted to answer it for  
10 the following reason: That when Mr. Toedter testi-  
11 fied as to his establishment of depth of barrier  
12 and then his furnishing Dr. Mesghinna the depth of  
13 barrier, Mr. Toedter indicated over and over under  
14 cross-examination that there were often five or  
15 six holes that would be used and that one might  
16 show a very shallow depth, that others nearby might  
17 show deeper depths and that he would use his pro-  
18 fessional opinion to decide what was the valid  
19 depth to give to that property. He showed how he  
20 often averaged holes or how he picked the deepest  
21 or the shallowest, depending on his professional  
22 judgment. And it is clear to me that from Dr.  
23 Mesghinna's prior testimony and from the search  
24 that has been going on in the last five minutes  
25 that this was an area of work that was done by



1 HKM that has been testified to by HKM that has  
2 been cross-examined in connection with HKM and that  
3 to give Mr. White the opportunity to pick out the  
4 one or two rejected shallow holes and then question  
5 this witness who was not responsible for the soils  
6 study as to why that hole was rejected and some  
7 deeper barrier picked does not add to the search  
8 for truth.

9 MR. WHITE: Do you want me to respond?

10 THE SPECIAL MASTER: Mr. Sachse, if your ob-  
11 jections would have been timely -- I hope you can  
12 appreciate that when an objection is not timely  
13 made, it makes the duty of a judge or a master all  
14 the more difficult to rule on an objection.

15 MR. CLEAR: Your Honor, we did make the objec-  
16 tion --

17 THE SPECIAL MASTER: You did and it was overruled,  
18 but it wasn't quite the one --

19 MR. SACHSE: Well, I make --

20 THE SPECIAL MASTER: Just a minute. -- with  
21 the detail and the accurate recollection of earlier  
22 testimony that Mr. Sachse has now, with all respect  
23 to your objection, timely made. I appreciate that  
24 this is not the witness to answer those things. I  
25 have permitted the question only because I think it's

1 still proper that it may be answered for whatever it  
2 may be worth. It is not a reflection upon the com-  
3 petence of Mr. -- or Dr. Mesghinna. It is brought  
4 out to show some reliance upon some information that  
5 may not be valid that will come up again in this case,  
6 I have no doubt, regarding these depth to barrier  
7 holes, the number of them, the taking of particular  
8 areas rather than defined irrigated fields. We  
9 haven't heard the last of this, so I'm going to over-  
10 rule your objection, Mr. Sachse, with all respect to  
11 you, and you may answer.

12 A. Okay.

13 Q. (By Mr. White) Isn't it true that the log for Hole  
14 D-32 in Field 19-20 shows sandy brown shale, 4 1/2  
15 feet to 9 feet?

16 A. If you would remember, before I said that that area  
17 is approximately the same, and I was not sure that  
18 that area was there. So it is with regret that I  
19 would say that area or Hole No. 32 does not show in  
20 Mr. Toedter's map as 20 feet depth to barrier, it  
21 shows a 7-foot depth to barrier.

22 Q. Okay, for Field 9-20, which of Mr. Toedter's areas  
23 is that field in?

24 A. That field is in -- Okay, the hole is somewhere

25 mesghinna - cross - white

1 here. That's A-32.

2 THE SPECIAL MASTER: Where are you pointing?

3 MR. WHITE: It is in A-3.

4 THE WITNESS: Yes, A-3.

5 THE SPECIAL MASTER: Thank you.

6 Q (By Mr. White) So you used the depth to barrier of  
7 7 feet for that field?

8 A. For that field area, yes.

9 Q And isn't it true then that Hole D-32 by the  
10 Bureau shows sandy brown shale, 1 1/2 to 9 feet  
11 there?

12 A. Yes, it shows that, Mr. White, but I think you would  
13 appreciate this field, or anyone in here would have  
14 appreciated this field, if one has to know through  
15 what kind of estimations we go when we determine a  
16 certain thing. There could be no four or five bor-  
17 ings in one area. One of them might show in a  
18 limited area, in a very small area, 1 foot depth  
19 to barrier, but in the surrounding area it might  
20 show like 20 feet, 10 feet, 5 feet, 7 feet, and so  
21 on. So because of that depth of barrier in there,  
22 you cannot assume really this area has a depth to  
23 barrier. You cannot generalize, that's what I'm  
24 saying, because you have just one area. So I am

25 mesghinna - cross - white



1 sure Mr. Toedter has gone through this and he has  
2 seen several borings. In fact, I have seen several  
3 borings right now there and, indeed, they show  
4 greater than 7 feet, I believe, most of the borings  
5 that I suggest now, the logs that I have seen.

6 Q Well, let me ask you this: At the point in Field  
7 9-20 where it is 1 1/2 feet to shale, what sort of  
8 drain depth and spacing are you going to have?

9 A Well, first of all, by definition, we don't have a  
10 soil that has less than 6 feet depth to barrier.

11 Q How do you know that when in Field 9-20 it is a foot  
12 and a half to sandstone?

13 MR. CLEAR: Your Honor, now, he's -- he's now  
14 -- Mr. Toedter went into this about how Mr. Toedter  
15 concluded those. He's not asking something from Mr.  
16 Toedter's maps. What he's asking now is how did  
17 Mr. Toedter reach his conclusions.

18 THE SPECIAL MASTER: I think Mr. White appre-  
19 ciates the fact that he may be getting close to  
20 enough of these. One or two more.

21 MR. WHITE: The point I'm trying to make is  
22 Mr. Toedter testified to an average for a fairly  
23 large area. Now, we are getting down to small  
24 fields and I'm testing the reasonableness of Mr.

25 mesghinna - cross - white



1 -- or Dr. Mesghinna being required to rely on that  
2 sort of information on an average for a larger area.

3 Q (By Mr. White) Now, let's turn to the Field 9-19.  
4 Isn't it true that there is -- the same plate, FM-  
5 10 -- isn't it true that the hole marked as E, which  
6 I believe you have already circled in red just north  
7 of D-32, falls within your Field 9-19?

8 MR. CLEAR: What hole was that?

9 MR. WHITE: E as in Echohawk.

10 Q (By Mr. White) Do you find E on there, Wold?

11 A Yeah, I found E, but I found -- it's hard from these  
12 maps to correspond to this.

13 THE SPECIAL MASTER: It is, indeed.

14 Will it help if one were to observe from an  
15 old dog-faced infantry view that it is about a  
16 quarter of a mile due north?

17 MR. WHITE: It is the bottom of 20. Here it  
18 is right there at the bottom of 20.

19 THE SPECIAL MASTER: The very bottom of Section  
20 20.

21 Has he got it?

22 A Okay, I have seen that area. It corresponds, it  
23 touches Field No. 19.

24 Q (By Mr. White) On the second sheet of FM-10,  
25 mesghinna - cross - white

1 isn't it true that the log for Hole No. 3 shows  
2 sandy shale, 2 feet to 9 feet?

3 THE SPECIAL MASTER: Isn't it true that it  
4 shows --

5 MR. WHITE: Sandy shale, 2 to 9 feet.

6 A. At about 9 feet.

7 Q (By Mr. White) Two to 9 feet, between 2 and 9 feet?

8 A. Sandy shale.

9 Q Yes.

10 A. Not --

11 THE SPECIAL MASTER: Not clay.

12 THE WITNESS: Not shale.

13 MR. WHITE: I said sandy shale.

14 THE WITNESS: Yeah, yeah.

15 THE SPECIAL MASTER: What does it say just  
16 under that?

17 THE WITNESS: Below the sandy shale at about  
18 -- if I can read this correctly, about 9 feet, I  
19 guess. Sandy gray shale about 9 feet. Isn't that  
20 true?

21 MR. WHITE: Yes.

22 Q (By Mr. White) What's the depth to barrier when  
23 you hit sandy shale at 2 feet?

24 A. Well, I have to know the soil above it, what kind  
25 mesghinna - cross - white

1 of hydraulic permeability it has above it.

2 Q Well, it is on the log.

3 THE SPECIAL MASTER: He would have to know  
4 the ratio --

5 THE WITNESS: I have -- exactly, I have to know  
6 the ratio of hydraulic permeabilities.

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1 THE SPECIAL MASTER: Mr. White, perhaps  
2 we have devoted enough time to depth to  
3 barrier, you're the judge of your time.

4 MR. WHITE: I'd like to spend some  
5 substantial time on it, Your Honor, because  
6 I think it may be well the most important --

7 THE SPECIAL MASTER: I thought earlier  
8 you had only two more questions.

9 MR. WHITE: No, not on this one, Your  
10 Honor. We could go for days, but I'd like  
11 to do enough of it so you get a strong flavor  
12 for problems of using averages when it comes  
13 down to dealing with fields by fields because  
14 I think it's a significant area that needs to  
15 be addressed.

16 THE SPECIAL MASTER: You be the judge  
17 of the evidentiary question of what limits  
18 this witness has to answer questions dealing  
19 with matters that were not in his dominion.

20 MR. WHITE: Your Honor, if there was  
21 evidence that the arable land base which he  
22 used was in fact the arable land base which  
23 is in evidence I think that Mr. Sachse's  
24 observations would have substantial merit,

25 mesghinna-cross-white



1 but the evidence is quite to the contrary,  
2 the evidence is that the Witness does not  
3 know whether or not the arable land base  
4 which HKM gave to him is the one to which  
5 Mr. Kersich testified before you. In fact,  
6 we were able to point out an area where  
7 there was a substantial discrepancy.

8 THE SPECIAL MASTER: Well, I don't  
9 remember every word of the weeks of testimony  
10 on the many, many holes that were drilled  
11 and the augering, but I came away with a  
12 conclusion that like most of us, that that  
13 too is a work of imperfectness and variations,  
14 as long as they are in a given tolerance, it's  
15 part of the real world.

16 The fact that they rejected the thousands  
17 of acres they did before they even considered  
18 what was left is proof, I think, of the good  
19 many tests that were made to eliminate areas  
20 that did not have proper depth to barrier or  
21 hydraulic conductivity.

22 (Brief pause.)

23 THE SPECIAL MASTER: Gentlemen, you  
24 remember the early months of this hearing,  
25 the hours we spent fighting about what's

1 legibile -- oh, you weren't here, Mr. Clear.  
2 Your predecessor, Ms. Sleater made a career  
3 of objecting to matters like this because they  
4 just are not readable. Now, I agree with her.

5 MR. WHITE: Your Honor, we made virtually  
6 the same degree of objecting to the illegible  
7 copies provided to us, which these happen to  
8 be some.

9 THE SPECIAL MASTER: We'll do the best we  
10 can.

11 Q (By Mr. White) Dr. Mesghinna, isn't it true  
12 that -- First of all I hand you what's been  
13 marked for identification as FM-15, and ask  
14 you whether or not the hole marked D-3 at the  
15 very top of the map falls within your North  
16 Crowheart Field 24104?

17 MR. SACHSE: Your Honor --

18 MR. CLEAR: Your Honor, I have an objection  
19 here. There's been no testimony that Dr.  
20 Mesghinna has relied on any of these maps being  
21 used now.

22 MR. WHITE: That's exactly the point of  
23 the cross-examination, Your Honor, he should  
24 have.

25 mesghinna-cross-white

1 THE SPECIAL MASTER: Go ahead with your  
2 objection.

3 MR. CLEAR: And he's being asked to say  
4 the hole says -- this hole is such and such,  
5 is so deep and has a depth to barrier, and he's  
6 never seen this before.

7 MR. SACHSE: Your Honor, --

8 THE SPECIAL MASTER: That doesn't exclude  
9 him asking the question and he can use this  
10 on his case in direct if he wishes to establish  
11 a matter attacking the credibility of what's  
12 on the record as arable lands. I suspect he  
13 intends to do that.

14 MR. CLEAR: This is not arable land, this  
15 is depth to barrier, which he's gone into  
16 to some extent.

17 MR. SACHSE: I have a separate objection  
18 to this, which I hope this time is timely  
19 because I'm objecting the minute the question  
20 was raised. And my objection is substantially  
21 the same as my previous objection.

22 What we've just seen is Mr. White use  
23 FM-10, an exhibit that had over 40 holes, to  
24 demonstrate the depth to barrier in a

25 mesghinna-cross-white

1 relatively small area of land, and pick out  
2 two of the 40 holes to try to give the  
3 impression that the depth to barrier must be  
4 judged by those holes.

5 Now, he did the same thing with Mr.  
6 Toedter, who is a soils engineer who had done  
7 the work and was an expert in this field and  
8 who demonstrated over and over again the way  
9 all the holes must be taken into account:

10 He's now proceeding to do the same thing  
11 with an exhibit that shows 21 different holes,  
12 and again with a witness who has not done the  
13 soils work as to which this pertains. Now,  
14 it's very clever cross-examination by Mr.  
15 White --

16 MR. WHITE: It's also proper.

17 MR. SACHSE: Let me finish -- to try to  
18 do with Dr. Mesghinna what he failed in doing  
19 with Mr. Toedter, which was to try to show,  
20 because one hole is in a shallow area of land  
21 it has to be rejected, even though if the  
22 majority of the holes show that the majority  
23 of that land is deep.

24 And to allow him to continue this line of  
25 mesghinna-cross-white



1 cross-examination with this witness is improper.

2 MR. WHITE: Can I respond to that, Your  
3 Honor? I think it's important.

4 THE SPECIAL MASTER: Yes, you may respond  
5 to that.

6 MR. WHITE: There are a couple of points  
7 that Mr. Sachse overlooks, and one of them is  
8 that the arable land base to which Mr. Kersich  
9 and Mr. Toedter testified and about which I  
10 cross-examined them, was not shown to be the  
11 same arable land base which Mr. Mesghinna has  
12 been given by HKM.

13 The second thing is that the cross-  
14 examination of Messrs. Toedter and Kersich  
15 went to the reasonableness of their arable  
16 land base determinations. What we're talking  
17 about now is not a large arable land base  
18 determination, we're talking about whether  
19 these particular fields should be included  
20 within BIA because they do not have a depth to  
21 barrier of six feet, but instead have areas  
22 within them having a depth to barrier of a  
23 foot and a half or two feet.

24 MR. CLEAR: Now he's asking them to  
25 mesghinna-cross-white

1 cross-examination with this witness is improper.

2 MR. WHITE: Can I respond to that, Your  
3 Honor? I think it's important.

4 THE SPECIAL MASTER: Yes, you may respond  
5 to that.

6 MR. WHITE: There are a couple of points  
7 that Mr. Sachse overlooks, and one of them is  
8 that the arable land base to which Mr. Kersich  
9 and Mr. Toedter testified and about which I  
10 cross-examined them, was not shown to be the  
11 same arable land base which Mr. Mesghinna has  
12 been given by HKM.

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14 examination of Messrs. Toedter and Kersich  
15 went to the reasonableness of their arable  
16 land base determinations. What we're talking  
17 about now is not a large arable land base  
18 determination, we're talking about whether  
19 these particular fields should be included  
20 within BIA because they do not have a depth to  
21 barrier of six feet, but instead have areas  
22 within them having a depth to barrier of a  
23 foot and a half or two feet.

24 MR. CLEAR: Now he's asking them to  
25 mesghinna-cross-white

1 testify as to depth to barrier.

2 MR. WHITE: Now, the point is that the  
3 United States has put this Witness in this  
4 situation, they have left him out here hanging  
5 because they've made absolutely no connection  
6 and they couldn't, between the arable land base  
7 with which he's been asked to work and the  
8 arable land base that the other witnesses have  
9 testified to. And as a result, I think that  
10 it is quite proper, and I understand that Mr.  
11 Sachse and Mr. Clear don't like the cross-  
12 examination, but I think it's quite proper to  
13 point out that with respect to Mr. Mesghinna's  
14 fields, it was not reasonable for him to be  
15 required to rely on the HKM work because he's  
16 he's got fields which he's been blindsided  
17 with essentially, he has fields that have depth  
18 to barrier that are remarkably shallow. It's  
19 not his fault, it's the fault of the way the  
20 case was put together, and the fault that he  
21 was required to rely on information that he did  
22 not develop himself in his usual painstaking way.

23 THE SPECIAL MASTER: Gentlemen, it will  
24 be my burden, when the case is closed to determine  
25 mesghinna-cross-white



1 the relevancy of the evidence, to determine  
2 what weight to give to the evidence and to  
3 draw conclusions therefrom. That's going to  
4 be more important than a ruling that something  
5 should have been sustained where it was  
6 overruled. I will overrule your objection  
7 only to permit this answer for whatever it may  
8 be worth to me in making that final adjudication.

9 I'm the person that has to meld and  
10 bring together and interrelate all of the  
11 testimony and I still don't follow that Dr.  
12 Mesghinna's working with an entirely different  
13 land base than was provided to him by HKM.

14 MR. WHITE: No evidence that it's the  
15 same one.

16 MR. SACHSE: I want to respond to that.

17 MR. CLEAR: There was ---

18 THE SPECIAL MASTER: Just a minute, I'd  
19 be happy to hear your responses if you'll  
20 just speak one at a time.

21 MR. CLEAR: There are questions raised  
22 on cross-examination and I believe it was  
23 particularly in respect to these HKM maps.

24 THE SPECIAL MASTER: You mean the flooded  
25 mesghinna-cross-white



1 area from the Boysen Reservoir?

2 MR. CLEAR: Not only that, Your Honor,  
3 but there were some areas, I think -- I think  
4 these were 52 to 56. There were some areas  
5 down here, they were called Parcel 40 on Dr.  
6 Mesghinna's maps. We went over there last night  
7 and the areas in the 40 parcels are shown in  
8 here. What happens was both Dr. Mesghinna  
9 and Mr. White, when they were reading Dr.  
10 Mesghinna's map --

11 MR. WHITE: I object to Counsel testifying.

12 MR. CLEAR: -- mistook a railroad track  
13 for being a section line, and when we -- on  
14 redirect we will show that all those areas are  
15 included on these maps or are in evidence  
16 through other means.

17 THE SPECIAL MASTER: Even if some aren't,  
18 those are tracts or portions are minutia  
19 compared to the general fact that he's working  
20 with same land base given to him as arable  
21 acres on which he must then run the test of  
22 whether they are practicably irrigable acres  
23 or not, and I believe I can --

24 MR. WHITE: The --

25 mesghinna-cross-white

1 THE SPECIAL MASTER: Just a minute, Mr.  
2 White, I'm going to come on your side of this  
3 if you give me a chance to, and I believe that  
4 I can make the judgment as to the relevancy  
5 and to the importance. They may not be proper  
6 questions on cross-examination, but I'm  
7 nevertheless going to overrule the objections  
8 and allow this one to be answered by the  
9 Witness. I may overrule the next one on the  
10 basis of an entirely new subject, duplication  
11 and redundancy.

12 MR. WHITE: The next one will be on a  
13 different field, Your Honor.

14 THE SPECIAL MASTER: Okay. You may answer.

15 MR. WHITE: You remember the question?

16 THE WITNESS: No.

17 MR. WHITE: Your Honor, could we take a  
18 short break?

19 THE SPECIAL MASTER: Let's take a ten  
20 minute break and recover our glum and  
21 normalcy.

22  
23  
24 \* \* \* \* \*

25

1 THE SPECIAL MASTER: Okay. Ladies and  
2 gentlemen, shall we resume?

3 Q (By Mr. White) Dr. Mesghinna, how many acres  
4 were in field 19 -- 9-19 and 9-20 in the Arapa-  
5 hoe unit that we were previously discussing?

6 A Okay. Let me try to go over this.

7 Do you have -- can I borrow a scale from  
8 someone?

9 MR. WHITE: Sure.

10 MR. CLEAR: What?

11 THE SPECIAL MASTER: A scale.

12 MR. WHITE: I saw an engineering scale --  
13 Henry, have you got one?

14 (Off the record discussion.

15 MR. WHITE: We don't have one.

16 Do you mean a little triangular engineering  
17 scale?

18 THE WITNESS: Yeah.

19 THE SPECIAL MASTER: There's not one in the  
20 courtroom, I don't think.

21 A Well, I can say approximately it might be about  
22 240 acres.

23 Q (By Mr. White) That's in which one? In both of  
24 them put together?

25 mesghinna-cross-white

1 A Say 19.

2 Q Okay.

3 A But I wish I could measure it.

4 THE SPECIAL MASTER: I think that's close  
5 enough.

6 Q (By Mr. White) Don't you have the field, the  
7 acreages listed by field?

8 A Yeah, but I don't think I have the right list  
9 before me. I think it is 235.

10 Q 235?

11 A Uh-huh.

12 Q How about in 20?

13 A I think 223.

14 Q Dr. Mesghinna, referring to FM-15, isn't it true  
15 that hole number 2 which you have circled towards  
16 the top center or at the top center edge of the  
17 exhibit lies within North Crowheart field 23-78?

18 A If I may be excused I have some comments on the  
19 previous borings that we discussed in Arapahoe.  
20 I'm not done with them --

21 Q Well, why, since it is my cross examination, maybe  
22 your lawyer can ask you that on redirect.

23 MR. WHITE: Your Honor, could we go ahead and  
24 do this?

25 mesghinna-cross-white



1 THE SPECIAL MASTER: Well, the unanswered --  
2 the question has been asked and which there was  
3 no answer dealt with D-3.

4 MR. WHITE: I'm sorry --

5 THE SPECIAL MASTER: -- and I permitted an  
6 answer to D-3 and I was wondering when we would  
7 get to it.

8 MR. WHITE: I apologize. I can do whatever  
9 you want.

10 Q (By Mr. White) Let's just go back to D-3 --

11 THE SPECIAL MASTER: You can pose the question  
12 if you wish.

13 Q (By Mr. White) Isn't it true that D-3 is in field  
14 24 -- 104 on North Crowheart?

15 A Yes, it is there.

16 Q Isn't it true that the soil log for Exhibit D-3  
17 shows hard grey sandstone three to eight feet?

18 A At what depth did you say?

19 Q Three feet to eight feet?

20 A Yes, but if we go back and see at D-3 the people  
21 who classified this land shows that this is class  
22 3 land, and I can't read it very well but I don't  
23 see any deficiency. Can you read the deficiency  
24 of the soils there?

25 mesghinna-cross-white

1 Q But isn't it true that the original classification  
2 was struck out and a class 6 was inserted above  
3 it? Just -- or are you talking about the land  
4 classification fraction just below D-3?

5 A Uh-huh.

6 Q Isn't a line through that, a line was struck  
7 through that and class 6 was written into the  
8 left?

9 A I'm not sure about that.

10 THE SPECIAL MASTER: I'm not sure he's  
11 competent to answer either because he sure didn't  
12 do these maps back in 1963.

13 Q (By Mr. White) Well, nevertheless, doesn't D-3  
14 show hard grey sandstone three to eight feet in  
15 field 24-104?

16 A Yes. I can read that.

17 Q You can't read that?

18 A I can read that. Yes, it says. But if I am  
19 allowed to comment on this --

20 Q Go ahead.

21 A You see, the whole point of the matter is you  
22 probably are looking on field by field but we  
23 don't work field by field on drainage and I have  
24 made that clear several times, and I would like

25 mesghinna-cross-white

1 to make it clear again. We work on the area.  
2 based on areas that have a boundary in a given  
3 area. You know, it is not just field by field,  
4 all the drainage. We can't go on like that.  
5 It is impossible to do that kind of work. There  
6 is no way that one would do even in the stage  
7 design. You know, in the stage of final design  
8 and specifications you won't go through this.  
9 I'm sure you understand that.

10 And secondly, some of these borings have  
11 been, you know, well, this is on the previous  
12 ones that I have found out that those soils did  
13 not have any deficiencies at all. They were  
14 taken as class 2 or class 3 soils with no soil  
15 deficiencies.

16 Q How do you know that?

17 A It is written there. I can show you.

18 Q How do you know that that line through that  
19 fraction doesn't mean that the classification  
20 was rejected and a class 6 classification assigned  
21 to it?

22 MR. CLEAR: Your Honor, --

23 THE SPECIAL MASTER: It is argumentative.

24 It is argumentative, Mr. White.

25 mesghinna-cross-white

1 THE WITNESS: I don't want to argue on this  
2 matter but --

3 MR. WHITE: Okay, don't.

4 Q (By Mr. White) Well, Dr. Mesghinna, we have looked  
5 at holes with depths to sandstone of a foot and a  
6 half, two feet, three feet, isn't your average  
7 root zone depth four and a half feet?

8 MR. CLEAR: Your Honor, we have looked at a  
9 map showing some holes on it which Dr. Mesghinna  
10 has not prepared and as far as we know has not  
11 seen.

12 THE SPECIAL MASTER: Nobody is being fooled.  
13 There is no jury to be misled by these remarks so --

14 MR. WHITE: The purpose is to point out that  
15 he was not given it, right. His work was structured  
16 and he didn't have an opportunity to look at things  
17 other than what HKM served up, and that's right,  
18 he hasn't looked at them before.

19 THE WITNESS: I have a comment on this, you  
20 know.

21 MR. WHITE: Go ahead.

22

23

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25 mesghinna-cross-white



1 Q (By Mr. White) Go ahead.

2 A On the Arapahoe, the two holes, D and E, I  
3 guess, those two holes have no deficiency at  
4 all. I think this map was made by USBR, and  
5 they have struck out those deficiencies, they  
6 have said that there is no deficiency on the  
7 soil. They have given them as Class 2 and  
8 Class 3 soils with no drainage problems, you  
9 see. They have taken several borings and it  
10 so happens one boring in one area was found  
11 to be, you know, shallow, and they struck out  
12 that boring and they used the other borings.  
13 That's what I'm trying to say. And over and  
14 above that we don't work field by field, we  
15 work on a bigger area as I have explained  
16 several times and I don't want to say it again.  
17 In fact, I'm just killing time.

18 Q Isn't it true that you plant, irrigate field  
19 by field?

20 A Plant, irrigate field by field?

21 Q That you're going to plant crops and irrigate  
22 field by field?

23 THE SPECIAL MASTER: That's an argumentative  
24 and questionable question. You might do it row  
25 mesghinna-cross-white

1 by row too or foot by foot, I don't know  
2 whether that term has much value; plot by  
3 plot, unit by unit.

4 Q (By Mr. White) Dr. Mesghinna, staying on  
5 Exhibit FM-15, do you find Hole No. D-17 also  
6 in Section 2?

7 A Yes, I can see it.

8 Q Isn't it true that Hole No. 17 lies roughly  
9 on the boundary between your Field 24.105 and  
10 24.106 in the North Crowheart?

11 (Brief pause.)

12 A Yes, you are right, sir.

13 Q Isn't it true that the log for D-17 shows gray  
14 sandy shale at four feet?

15 A Isn't it lower than that? It's lower than  
16 that, it is between five and ten feet I guess.

17 THE SPECIAL MASTER: I can appreciate  
18 how difficult that is to read, gentlemen.

19 MR. SACHSE: Your Honor, the Tribes wish  
20 to renew. --

21 THE SPECIAL MASTER: I recognize your  
22 objection and you are permitted to make it  
23 again and you have a continuing objection  
24 should there be anymore of these this afternoon.

25 mesghinna-cross-white

1 MR. WHITE: I'm going to have some more.

2 MR. SACHSE: I want to add another  
3 ground to the objection. It's clear that  
4 we're using maps that are difficult to read,  
5 a witness who didn't do the work and who's  
6 being asked to comment for the first time on  
7 the basis of one hole out of 20 or 30. The  
8 whole process is not just neutral, it's a  
9 misleading process.

10 THE SPECIAL MASTER: I appreciate that.

11 MR. SACHSE: That it moves away from  
12 expertise to speculation, it shouldn't be  
13 permitted.

14 THE SPECIAL MASTER: I appreciate your  
15 objection, and I have with reluctance, over-  
16 ruled them, Mr. Sachse. And I have said I  
17 think earlier we would listen to one more,  
18 and I would do the overruling, but not on those  
19 grounds, but on the grounds of redundancy  
20 and repetition because the point has been  
21 made.

22 MR. WHITE: It might --

23 THE SPECIAL MASTER: Argument has been  
24 made by Counsel, and despite what they think  
25 is an improper ruling on my part, and I haven't

1 permitted it to be made.

2 MR. WHITE: Your Honor, if you're going  
3 to not allow me to go forward, it might be  
4 a good idea to do it now and I can make my  
5 offer of proof.

6 THE SPECIAL MASTER: I was going to say,  
7 Mr. White, whatever it reads, three foot or  
8 five feet, we can recognize that it is another  
9 example of the point you are making in this  
10 cross-examination, and I would now rule that  
11 any further questions be denied on this  
12 particular subject matter from these series  
13 of maps on the basis that that would constitute  
14 a redundancy and repitious pursuit of matters  
15 that add nothing to the -- to our case.

16 So you can proceed to other areas if you  
17 want, Mr. White, or if some of you people want  
18 to call it early it won't hurt my feelings.

19 MR. WHITE: Why don't I make an offer of  
20 proof on this area, Your Honor, and then we  
21 can go into a couple other areas.

22 THE SPECIAL MASTER: All right. I may  
23 be calling you back, Dr. Mesghinna, long  
24 after your case is completed, both on behalf  
25 of the United States, and if you recall, by



1 the State of Wyoming, because I want to ask  
2 you some questions about the investigation  
3 and get the answers into the record. Are you  
4 familiar with the things I have in mind  
5 regarding possible settlement of disputes and  
6 mutual development of the resources to maximum  
7 capacity water for everybody's benefit?

8 THE WITNESS: Yes, I would be glad to help  
9 on that matter.

10 THE SPECIAL MASTER: All right. That will  
11 come after a conclusion of our evidentiary  
12 case.

13 MR. WHITE: Your Honor, if allowed to  
14 respond to ---

15 THE SPECIAL MASTER: Allowed to continue.

16 MR. WHITE: If allowed to continue to  
17 respond to this type of question concerning  
18 fields which have holes in them indicating  
19 a depth to barrier of less than -- Well, the  
20 first portion of the offer of proof, four and  
21 a half feet, second portion of the offer of  
22 proof, less than six feet, Dr. Mesghinna would  
23 indicate that in addition to those fields which  
24 he has previously identified, there would be,  
25 in the Arapahoe Unit, at least two additional

1 fields having less than four and a half feet  
2 to barrier or holes within them having less  
3 than four and a half feet to barrier.

4 In the North Crowheart, approximately 20  
5 or 21 fields --

6 THE SPECIAL MASTER: Holes.

7 MR. WHITE: I'm sorry?

8 THE SPECIAL MASTER: Holes.

9 MR. WHITE: Fields with holes in them  
10 with depths to barrier showing less than four  
11 and a half feet.

12 In South Crowheart, eight fields showing  
13 holes within them having depths to barrier  
14 of less than four and a half feet.

15 In Riverton East, one such field.

16 With respect to holes or fields having  
17 holes in them indicating a depth to barrier  
18 less than six feet, North Crowheart would  
19 include approximately 15; South Crowheart,  
20 6; Riverton East, again 1; Arapahoe Unit, 3,  
21 and those holes or those fields having holes  
22 less than 6 feet are additive, in addition  
23 to the fields having holes showing a depth  
24 to barrier of less than four and a half feet.  
25 In addition -- Well, I'll stop with the offer

1 of proof there, Your Honor.

2 Could I have about five minutes to get  
3 some notes together and I think I would have  
4 about another oh, no more than about another  
5 hour this afternoon and then a short period  
6 for about an hour and a half tomorrow morning.

7 THE SPECIAL MASTER: We'll be in recess  
8 for five minutes.

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1 THE SPECIAL MASTER: Shall we resume, please.

2 Q. (By Mr. White) Dr. Mesghinna, within your Table 24  
3 on page 42 of your report I believe C245, where  
4 do you include cost for land leveling and land  
5 preparation?

6 A. First of all this is sprinkler irrigation. It is  
7 not gravity irrigation.

8 Q. Uh-huh.

9 A. So the land leveling and so on, there is no, as such,  
10 land leveling in the sprinkler irrigation, not to  
11 the extent what we talk in surface or gravity  
12 irrigation.

13 Q. But there is some, isn't there?

14 A. There is some clearing and so on and so on and  
15 you are right about that. And that has been  
16 included by the economist.

17 Q. So those values are not included in your table?

18 A. Yes.

19 Q. Okay --

20 THE SPECIAL MASTER: Have been included --

21 THE WITNESS: By the economist.

22 MR. WHITE: Mr. Dornbush will have them,  
23 Your Honor.

24 THE SPECIAL MASTER: By the conomist. Thank you.

25 mesghinna-cross-white



- 1 Okay.
- 2 Q. (By Mr. White) Dr. Mesghinna, you have previously
- 3 given some of the Q values you used for the
- 4 pump field layout. In other words, the design
- 5 flow quantity. Do you have a listing of all of
- 6 those values being values which you used?
- 7 A. Will you say the question again?
- 8 Q. In your pipe network system --
- 9 A. Uh-huh.
- 10 Q. -- you developed Q values?
- 11 A. Uh-huh.
- 12 Q. For which are design flow quantities --
- 13 A. Uh-huh.
- 14 Q. For your pump field laterals, is that correct?
- 15 A. Yes, sir.
- 16 Q. You have given us some of those?
- 17 A. Uh-huh.
- 18 Q. Do you have a list of all of them?
- 19 A. Well I believe I have given you everything.
- 20 Q. Okay. Well, we'll cough up everything we think
- 21 you have given us tomorrow and we'll find out.
- 22 A. Okay.
- 23 Q. How about the pipe diameters? Have you given us
- 24 all of those?
- 25 mesghinna-cross-white

1 A. Pipe diameters?

2 Q. Yeah.

3 THE SPECIAL MASTER: Pipe what, Sandy?

4 MR. WHITE: Diameters, Your Honor.

5 THE WITNESS: We have never given you pipe  
6 diameters, I believe.

7 Q. (By Mr. White) Do you have them segment by segment?

8 A. We have the whole books, you know.

9 Q. But do you have those with you in the courtroom?

10 A. Yeah.

11 Q. Oh, okay. Can I take a look at those to see what  
12 they look like?

13 A. Sure.

14 I don't think you like this. It's too big.

15 Q. I can tell it's breaking your heart.

16 THE SPECIAL MASTER: I thought you gave us a  
17 formula on direct called a Haeden-Williams formula  
18 and it is  $Xf$  equals  $Q$  times  $X$  for the lower 152.  
19 Now that's pretty rough notes from a layman and  
20 that dealt with your pipe.

21 THE WITNESS: You are exactly right, sir.  
22 That's the formulas that they have to use in order  
23 to come up with the pipe network design.

24 THE SPECIAL MASTER: And you said that six-inch  
25 mesghinnacross-white

1 pipe would be your smallest pipe on the system?

2 THE WITNESS: Yes, sir.

3 THE SPECIAL MASTER: Excuse me. I'm not trying  
4 to help you with your case, I'm not really. Go ahead  
5 and answer his question.

6 THE WITNESS: I think you have helped the  
7 matter. That was the case.

8 THE SPECIAL MASTER: Okay.

9 Q. (By Mr. White) Okay. What do you have there, do  
10 you have the pipe diameters by segments?

11 A. The pipe diameters in here are on calculations.

12 Q. Okay.

13 A. And just for North Crowheart it is almost half the  
14 book, as you can see.

15 Q. Can I borrow that for just a second?

16 A. Of course.

17 Q. To look at it?

18 (Brief pause.)

19 THE SPECIAL MASTER: While Mr. White is looking  
20 might I ask a question or two, Mr. White, or would  
21 that detract you?

22 MR. WHITE: Let me listen in, Your Honor.  
23 I'm always curious about your questions.

24

25 mesghinna-cross-white

1

EXAMINATION

2

BY THE SPECIAL MASTER:

3

Q. Did you testify that you did use some forty-eight  
4 inch steel pipe or that you did not because that  
5 would add too much to the cost of the pipe?

6

A. I testified that I used forty-eight inch pipe,  
7 I believe.

8

Q. And what did you say regarding fourteen to thirty-  
9 six-inch asbestos cement pipe?

10

A. Yes, sir, fourteen to thirty-six.

11

Q. You used some of that?

12

A. Asbestos cement and from six to twelve inch PVC  
13 pipe.

14

Q. PVC?

15

A. Yes.

16

Q. What does that mean?

17

A. Plastic pipes.

18

CROSS-EXAMINATION (Resumed)

19

BY MR. WHITE:

20

Q. Dr. Mesghinna, I see that you have already given  
21 us some of that material but not others. Would  
22 you keep your mind on this kind of material for  
23 not only North Crowheart but the others and that will  
24 save us a lot of time if we can burn a copy of that

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1 material which you haven't given us?

2 A. Uh-huh.

3 Q. That section also included the pipe length  
4 calculations too, did it not, the material in there,  
5 your calculations in that section you just showed me?

6 A. Yes. What I was asked was I gave you the diameters  
7 and so on and how the pipes are laid and everything  
8 and I gave you the Qs necessary to determine the  
9 pipe diameters.

10 Q. I understand but I want to know the pipe diameters  
11 you used.

12 A. In fact I gave you an example on how to determine  
13 the pipe diameters there.

14 Q. This is not an exercise, Dr. Mesghinna, in our  
15 determining, it is a question of what you determined  
16 and that's what I'm asking you about.

17 A. Yeah, well.  
18  
19  
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25

1 Q (By Mr. White) Does that information which  
2 you shared with us include the roughness  
3 coefficient that you used?

4 A Yes.

5 Q With respect to pumps and pumping plants I  
6 was confused about whether you included the  
7 costs of parking lots. It seems like a silly  
8 thing, but it was something that kept bothering  
9 me. Did you or did you not include those?

10 A Mr. White, on our pumping plants we have  
11 included almost everything beyond what is needed  
12 in a design of a pumping plant.

13 THE SPECIAL MASTER: We have included  
14 or we have excluded everything?

15 THE WITNESS: Let me --

16 MR. WHITE: I think he said it was included.

17 THE WITNESS: I'll go over this.

18 Q (By Mr. White) Did you include parking lots?

19 A Let me go over this one by one because you're  
20 talking of really complicated and complex  
21 items, you see. I can't remember everything  
22 by heart.

23 Q Well, do you remember whether you included  
24 parking lots?

25 mesghinna-cross-white

1 A To a certain extent, yes.

2 Q Okay. I guess I'll have to ask you what you  
3 mean by a certain extent.

4 A Okay. This is the reason I say I have to  
5 explain it.

6 Q Go ahead.

7 A Our pumping plants include -- give me one  
8 minute.

9 Q Sure.

10 (Brief pause.)

11 A Our pumping plants include pumps and prime  
12 movers. It also includes structures and the  
13 equipment.

14 Now in structures and equipment the  
15 following items are included -- When we say  
16 structures and equipment -- I mean structures  
17 and improvements, substructure, meaning the  
18 lower part of the -- where the water is  
19 connected so the canals can pump out.

20 The super structure of the building where  
21 you have a building, yard facilities such as  
22 fence, lighting and parking; building facilities  
23 such as water, sewage, lighting and heating.

24 Now, I believe in my testimony, in my direct  
25 mesghinna-cross-white

1 testimony and also I believe in my summary  
2 report I have indicated that we have used  
3 the Bureau of Reclamation guidelines in part.  
4 What it means is that we did not rely 100  
5 percent on the USBR works. We also relied  
6 on works from what's been done here in Wyoming,  
7 directly from this area on pump costs and so  
8 on.

9 So for the structures and equipment,  
10 if there is more than one pump in the same  
11 location, the cost of structures and equipment  
12 will be multiplied by .75. What I am trying  
13 to say is, you know, if you have -- if you  
14 build a structure for one pump station and  
15 you have another pump right there, you don't  
16 have to build exactly the same size of  
17 building and structure, you have to make --  
18 I mean you have to make at least half of that  
19 for both of them, you know. So to take care  
20 of that we have multiplied it by .75 percent.

21 The other thing that we have included is  
22 the accessory and electrical equipment.

23 Q What are those costs?

24 A Those include the motor control equipment and  
25 mesghinna-cross-white



1 wiring station service equipment.

2 Q Motor control equipment --

3 A And wiring station service equipment. I think  
4 what these are the starters, transformers  
5 on the poles to reduce the voltage to the  
6 necessary voltage.

7 Q What cost did you include for those two items  
8 of accessory and electric equipment, or did  
9 you use the figures one through five?

10 A We used a graph and then we had our own graph  
11 final.

12 Q Do you have your figures six, your graph six?

13 A We have a graph of our own, Stetson Engineers  
14 developed a graph out of these items and  
15 experience of the company and also out of the  
16 works that have been done here in Wyoming  
17 near us, which is not much different than the  
18 work we are doing.

19 Q Do you have a copy of that graph with you?

20 A You mean the Stetson Engineers' graph?

21 Q Yeah, what you and I were talking about,  
22 figure 6.

23 A Yes, I have that graph with me.

24 Q May I take a look at it, please?

25 mesghinna-cross-white

1 A Sure, sir.

2 (Brief pause.)

3 Q What is scaled along the vertical axis?

4 A That is Q times TDH.

5 Q And the horizontal?

6 A That is percentage.

7 Q Okay. And its percentage of?

8 A Let me explain this.

9 Q Okay.

10 A It will take some time. What it is if you  
11 see the first graph in the US Bureau of  
12 Reclamation, there is a graph that shows field  
13 cost, dollars per c.f.s. on the vertical side  
14 and on the horizontal side total head meaning  
15 total lift in feet.

16 And this by entering the total head in  
17 feet and multiplying it by the number of  
18 c.f.s. will give the cost in dollars of the  
19 pumps and prime movers.

20 So from the data that I have given you,  
21 Q and TDH, of all the pump stations, of all  
22 the units, you can get Q times TDH by entering  
23 that Q times TDH on Stetson's map figure.  
24 You get a percentage, nine percent, eight

25 mesghinna-cross-white

1 percent, ten percent, whatever it comes.

2 Now, if you divide the cost of pumps  
3 and prime movers by that percentage you will  
4 get the cost of pump and pumping plants for  
5 1979. In it the graph includes also the  
6 indexing of the cost of pumps and pumping  
7 plants from 1968, in which the graphs of the  
8 USBR were made, to 1979 by Stetson Engineers.

9 So this is the complete picture of how  
10 it works.

11 Now, if you compare our cost of pumping  
12 plants with pumping plants that are designed  
13 in Wyoming, I think there is a big difference..  
14 And that can be proved.

15 Q What -- What do the cost of the manifolds and  
16 the valves appear within your graph, are they  
17 included within the graph as well?

18 A Yes, sir. Let me go and finish what I was  
19 reading.

20 Q I'm sorry, I thought you were done.

21 A Well, I was asked another question about my  
22 graph and I went over my graph.

23 I discussed that we have included the  
24 accessory and electrical equipment. The next

25 mesghinna-cross-white

1 thing we have included is pumping plant  
2 miscellaneous. Now, what does pumping plant  
3 miscellaneous equipment include? It includes  
4 handling equipment such as cranes and hoists,  
5 equipment for service facilities such as air  
6 compressors and receivers, pump priming  
7 equipment on watering and drainage pumps and  
8 motors.

9 We included these costs which is quite a  
10 high cost, but we know that the operation and  
11 maintenance crew will have a portable equip-  
12 ment, you know, can easily be solved with  
13 portable equipment for the whole area without  
14 having for each and every pump station.

15 So the reason why I'm saying this is  
16 other cost is partly this and others.

17 The other thing we have included in our  
18 cost is the manifolds and valves. The cost  
19 of manifolds and valves has been assumed  
20 at 50 percent of the costs for pumps and  
21 prime movers, which is used by the USBR,  
22 guideline of the USBR, so these are the things  
23 that we have included.

24 In my direct testimony I have indicated  
25 mesghinna-cross-white



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also when Mr. Sachse asked me a question, I  
also indicated that we have not included  
one of the figures which is figure 5 on the  
Reclamation structures, that says pumping  
plants switchyards. Other than that we have  
included everything. And we have reasons for  
not including that. The reason why we are  
not including it, I can say if you want me to  
say it.

\* \* \* \* \*

mesghinna-cross-white

1 Q. (By Mr. White) Keep going. You're doing a great job.

2 A. Yeah, you're going -- well, I might ask you to  
3 ask it before you answer me.

4 The reason for that is, if you see, they give you  
5 an example on how to calculate these things somewhere  
6 in the pages which you and me have gone over in my  
7 deposition. It is on page -- well, I don't see any  
8 page.

9 Q. I know where the example is.

10 A. Okay. You know where it is.

11 They give an example for that pump station which  
12 has a lift of 140 feet and 50 cfs which is really  
13 a large amount of water. They give 41,000 of field  
14 cost for that switch yard that I just mentioned  
15 and that one is what percentage of the total cost?  
16 That is about fifteen percent of the total cost.  
17 So we assume that since we have overestimated the  
18 rest of the things in all, instead of having super  
19 structures of concrete walls and so on you can simply  
20 use a shed. You don't have to have a parking lot,  
21 switchyards, sewage systems, you know. I mean we  
22 are talking, you know, of a pump, irrigation pumps.  
23 Because one thing that we have to be realistically  
24 is the USBR guidelines are made for big pumping plants

25 mesghinna-cross-white

1 where you have big ones and people can stay there,  
2 you know, watching the pumps and so on, you know.  
3 But then what we have used, just to finalize my  
4 discussion, we have compared it with other works and  
5 we found out that we are way, way over the work,  
6 the designs and the cost that has been done by other  
7 firms. In fact, the ones that I mentioned here in  
8 Wyoming --

9 THE SPECIAL MASTER: Way, way over or way, way  
10 lower?

11 THE WITNESS: Way, way over. This is over.

12 THE SPECIAL MASTER: In your costs?

13 THE WITNESS: In our costs, yes.

14 I can verify this, you know, very easily.

15 THE SPECIAL MASTER: To what do you attribute  
16 that?

17 THE WITNESS: Yes. There is a work that has  
18 been done by an agency which I think you are familiar.  
19 I can bring -- let me try to find it.

20 MR. WHITE: I take back my representation I  
21 would be done in an hour, Your Honor.

22 THE SPECIAL MASTER: That's all right. We can  
23 go for a few minutes.

24 THE WITNESS: Huh?

25 mesghinna-cross-white

1 Q. (By Mr. White) Never mind.

2 THE WITNESS: I'm trying to help to expedite things.  
3 Work that has been done by West Side Irrigation  
4 Project Study at Big Horn County and Washakie County,  
5 Wyoming shows their cost per horsepower much much  
6 lower than ours, at least by fifty percent lower than  
7 ours for their pumping plants.

8 Q. (By Mr. White) And you base your feeling that your  
9 costs are very conservative --

10 A. Oh, yes.

11 Q. -- based on West Side?

12 A. Yeah, and also we have asked several manufacturers,  
13 and when you compare the cost of the pump, you see,  
14 the cost of the pump according to our estimation is  
15 only ten percent of the whole structure and that is  
16 quite unbelievable, you know, for a ten thousand  
17 pump, a pump that costs \$10,000. We spend \$60,000  
18 for its structure and so on and I think from the  
19 logical point of view anyone would say that this  
20 is overcosted, you know. As I have said it earlier,  
21 before this time, you can go really -- and I'm not  
22 underestimating anything, but you can go for a  
23 ten thousand pump, you go really with five or six  
24 thousand probably at the most \$10,000 under facilities  
25 mesghinna-cross-white



1 rather than going to sixty thousand.

2 Q. Well, Dr. Mesghinna, instead of being so conservative  
3 with these sorts of items including cost items that  
4 you apparently don't feel are really necessary, instead  
5 of including those costs, why didn't you line the  
6 canal and reduce the amount of water you had to divert?

7 THE SPECIAL MASTER: I think that's argumentative  
8 and -- well, we'll skip that.

9 THE WITNESS: Do you want --

10 MR. WHITE: You don't have to answer the question.

11 THE SPECIAL MASTER: You don't have to answer it.

12 We've walked that canal.

13 Q. (By Mr. White) Let's talk about canals here for a  
14 little while and let me ask you at what frequency  
15 did you propose to include canal check structures?

16 THE SPECIAL MASTER: Canal check structures?

17 MR. WHITE: Canal check structures.

18 THE WITNESS: Do you mean our check structures  
19 are included? Do you mean the check structures at  
20 each pumping station?

21 Q. (By Mr. White) Sure. To check your structure, to  
22 give you a little pool of water.

23 THE SPECIAL MASTER: Perhaps for the benefit  
24 of -- for my benefit you might define a check structure.

25 mesghinna-cross-white

1 Q. (By Mr. White) Wold, would you state for the record  
2 what a check structure is?

3 A. Well a check structure is nothing but a structure  
4 that keeps -- when you have a canal and water is  
5 passing by and there is a pumping station on the  
6 side of the canal and what the check structure does  
7 is gives the -- it guides the water to give enough  
8 head for the pump to pump out water. That is at  
9 every pumping station and --

10 Q. Do you have any intermediate check structures between  
11 pumping stations?

12 A. No, we have not assumed.

13 Q. Have you designed the check structures -- well, let  
14 me start again.

15 For what ponding, increased ponding depths,  
16 did you design the check structures?

17 A. I think the most important thing is if I give you  
18 an idea of how the canal and the pump station looks,  
19 because check structures in the kind of designs that  
20 we have that we have proposed are not really  
21 pertinent. They are within the pump stations, you  
22 see.

23 Q. Okay. The cost for the check structures are within  
24 the pump stations?

25 mesghinna-cross-white

1 A. Yeah. Let me give you -- yes.

2 Q. If that's the answer, that's fine. I'm looking in the  
3 canal costs and I didn't see them.

4 A. Uh-huh.

5 Q. So that's included in your curve?

6 A. On the curve, yeah.

7 Q. Okay. I think you've indicated to us previously that  
8 canal excavation costs was assigned by you the value  
9 of a \$1.06 per cubic yard, is that correct?

10 A. Yes, sir.

11 Q. Does that include anything besides excavation such  
12 as hauling, placing, spreading, compacting?

13 A. I believe I have given the compaction and spreading  
14 and the things to Mr. Henry of your --

15 MR. WHITE: Mr. Henry?

16 THE WITNESS: I mean Mr. Sostrom.

17 Q. (By Mr. White) Was that your work item No. 3?

18 A. Probably, yes. I think so.

19 MR. WHITE: I've got one here.

20 Your Honor, I apologize for working with material  
21 that's not of evidence. Tomorrow morning, however,  
22 we are going to try to put everything in we've gotten  
23 from Wold so we are sure that we are all talking  
24 about the same thing.

25 mesghinna-cross-white

1 THE SPECIAL MASTER: No problem. No problem.

2 Q. (By Mr. White) Is that work item No. 3: Placing,  
3 spreading, rolling, top soil for seed bedding?

4 A. Yeah. That's -- Again, that is -- we are making  
5 the canal more fancy by putting top soil, you know,  
6 on the side of the canal.

7 THE SPECIAL MASTER: Yeah.

8 THE WITNESS: You put top soil on it --

9 THE SPECIAL MASTER: To keep the erosion away?

10 THE WITNESS: Keep the erosion away and we are  
11 assigning money, a tremendous amount of money for that.

12 THE SPECIAL MASTER: Do you line a canal with  
13 some gravel?

14 THE WITNESS: We have gravel surface for the  
15 canal on one side.

16 Q. (By Mr. White) On the outside, is that right?

17 A. On one side.

18 THE SPECIAL MASTER: On the bottom side.

19 Q. (By Mr. White) Well, in addition to work item No. 3,  
20 where else did you include those things such as --

21 A. Cost of excavation?

22 Q. -- those items?

23 A. That is working --

24 Q. Yes.

25 mesghinna-cross-white



1 A. Here for example, compaction of embankment.

2 Q. Okay.

3 A. You see you have the -- you excavate the canal. When  
4 you excavate the canal then we have assumed, by the way,  
5 two roads on both sides of the canal and that is also  
6 an overdesign in a sense because many people use one  
7 road. So --

8 Q. But not real efficiently, isn't that correct?

9 A. Yeah. Well, you know, every project has its own  
10 deficiency, but this project is really loaded with  
11 things on it. At any rate --

12 Q. With one exception.

13 A. The lining.

14 (Laughter in the courtroom.)

15 A. Well so we put -- when you put the embankment on  
16 both sides ten feet, twelve feet, whatever the widths  
17 of the roads are, then we compact the soil you see  
18 so that when equipment and so on pass through it  
19 there won't be any problem and after compacting it  
20 we generously put three inches of gravel all the way  
21 from end -- from beginning to end on one side of the  
22 road. That is work.

23 Q. Do you mean on one of the two roads you put gravel  
24 on?

25 mesghinna-cross-white

1 A. Yeah. You see there are many other roads or excavation  
2 works for the structures and so on that we have put  
3 on this thing and I think I have given that to Mr.  
4 Sostrom.

5 Q. Wold, on that worksheet that you and Henry talked  
6 about over the telephone, where are your syphon  
7 costs included?

8 A. Our syphon costs must be included in the pipelines  
9 and the structures.

10 THE SPECIAL MASTER: What does the syphon cost  
11 include? Just the pipe itself that you turn over,  
12 I mean that's all a syphon is, isn't it, just a  
13 little --

14 THE WITNESS: Well a syphon costs millions of  
15 dollars.

16 THE SPECIAL MASTER: Millions of dollars?

17 THE WITNESS: Yes. We have assigned them  
18 millions of dollars. That's what I'm saying. This  
19 project really is overcosted. You know, I'm not  
20 really kidding about this.

21 THE SPECIAL MASTER: You say this project is  
22 overcosted?

23 THE WITNESS: Yeah. I mean not really overcosted  
24 but we have been on the safe side. We have used  
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Bureau of Reclamation standards --

THE SPECIAL MASTER: And you feel that they are, however, they are possibly higher than the truth -- than the facts will be upon its completion?

THE WITNESS: Yeah, because it's better to be careful than come back with problems later on.

THE SPECIAL MASTER: You sound like you have prepared requests for appropriations from Congress.

(Laughter in the courtroom.)

THE WITNESS: It might end up that way, sir.

mesghinna-cross-white

1 Q (By Mr. White) Are there any other costs  
2 included within the pipeline for structures  
3 category aside from siphons?

4 THE SPECIAL MASTER: Under canals and  
5 related structures?

6 MR. WHITE: Yes, sir. This is working  
7 off a sheet that you don't have, Your Honor,  
8 and we'll have it tomorrow.

9 THE SPECIAL MASTER: All right.

10 (Brief pause.)

11 THE WITNESS: Yes, sir, there are some  
12 other things included there.

13 Q (By Mr. White) Could you tell me what those  
14 are, please?

15 A Although it is very hard to go through every-  
16 thing.

17 Q You have a list of them?

18 A We have costs of cost drainage. In North  
19 Crowheart alone we have assumed 41 cross-  
20 drainage.

21 Q What do you mean by cross-drainage?

22 A Cross-drainages are by-pass pipelines under  
23 the canal.

24 Q It's to keep water that's draining off of the  
25 mesghinna-cross-white



1 upper fields --

2 A From the upper areas.

3 Q -- from coming into the canals?

4 A Coming from rainfall and so on and so on and  
5 keeping it from destroying the canal that  
6 it passes through.

7 Q Instead of bypassing the canal with that  
8 natural drainage, you put that drainage into  
9 the canal, isn't it true that if you could  
10 manage the fluxuating nature of that drainage  
11 you would reduce your headgate diversions at  
12 the river?

13 A Well, it doesn't mean we haven't thought over  
14 that. We have thought over that and we have  
15 considered it. The problem is that water is  
16 unpredictable; and also that the water does not  
17 come during most of the time, does not come  
18 during the --

19 THE SPECIAL MASTER: The season that you  
20 need it, sounds like Wyoming.

21 THE WITNESS: Season when you need it,  
22 so that's the reason we have excluded it. But  
23 if you drain it out, whatever it comes.

24 Q (By Mr. White) What size of structures did you  
25 mesghinna-cross-white

1 have in mind for canal wasteways?

2 A Canal wasteways?

3 Q I'm sorry, can we go back, I don't think you  
4 answered the last question, the other items  
5 that you had included within pipeline for  
6 structures. You told me the cost of cross-  
7 drains. Were there other items in there as  
8 well?

9 A Yes, I think there are many.

10 Q Can you give me those, please?

11 A You have a big item of road crossings.

12 THE SPECIAL MASTER: Drop crossings?

13 THE WITNESS: Road crossings. You see,  
14 when a canal passes through a road we have to  
15 make sure that we have -- we have to assign  
16 some cost on it and --

17 THE SPECIAL MASTER: Bridge structures?

18 THE WITNESS: Yes, just -- almost like a  
19 bridge, you're talking like a bridge. And  
20 just to give you as an indication of that,  
21 of this, we have about 17 road crossings in  
22 the North Crowheart Canal alone. Seven of the  
23 road crossings are major road crossings like  
24 small county roads, we call them major.

25 mesghinna-cross-white

1 THE SPECIAL MASTER: You call them  
2 midget?

3 THE WITNESS: Major road crossings.. I  
4 think probably I am tired towards the end of  
5 the day. And the rest of the ten we just  
6 assign them ourselves, those roads are not  
7 there but we put them in ourselves to be  
8 safe, that to go from one set of fields to  
9 other fields you have to cross the canal, so  
10 that we have assigned costs for those, potential  
11 roads, we might say.

12 So for those road crossings we have used  
13 pipelines, you know, complete -- No, corrugated  
14 pipelines.

15 Q (By Mr. White) Okay. Now, what size of  
16 structures did you have in mind for your  
17 canal wasteways?

18 A Okay. Canal wasteways are quite complicated  
19 to design it and also to put it wherever it  
20 is necessary.

21 The wasteway is also -- The canal waste-  
22 way is also concrete, reinforced concrete  
23 structure is our assumption. When the water  
24 enters into the wasteway, which is parallel

25 mesghinna-cross-white

1 with the canal itself, the wasteway, then it  
2 is, it comes to a collecting point and from  
3 that collection point it is taken out by  
4 pipes, concrete pipes. From those concrete  
5 pipes we discharge it into creeks if there is  
6 a creek right by. If not, we have to construct  
7 a ditch and take it to the creeks.

8 Just to give an example, in the North  
9 Crowheart Canal we have three main wasteways.  
10 One is at Dry Creek, the other one is at Five  
11 Mile Creek and the other one at the end of  
12 the canal to drain the canal out. And also at  
13 the end of Pavillion Canal. In fact, there  
14 are four.

15 Q Are those four wasteway locations shown on  
16 your plates -- copies of which have been marked  
17 FM-1249-A for North Crowheart?

18 A As you are well aware of, Mr. White, you cannot  
19 put everything in the plans, it will be very  
20 crowded, you know. We have put the main,  
21 important structures that we believe should be  
22 there, and --

23 THE SPECIAL MASTER: Did you say all four  
24 of them are in the North Crowheart area?

25 mesghinna-cross-white



1 THE WITNESS: Yes, all that I have  
2 discussed.

3 THE SPECIAL MASTER: Are there other  
4 wasteway plans in any of the other facilities?

5 THE WITNESS: Yes, each canal has its  
6 own wasteway. There is no canal without a  
7 wasteway, this is a prerequisite for a canal.

8 Q (By Mr. White) Would, do you have a list or  
9 any other indication where I don't have to  
10 ask you about the locations of all these? Do  
11 you have them listed in tabular form or do you  
12 have a map where you have them annotated on?

13 A No, I don't have that.

14 Q Okay.

15 A But I --

16 THE SPECIAL MASTER: Where would they next  
17 show up, on design specifications?

18 THE WITNESS: They will show up on our  
19 calculations.

20 Q (By Mr. White) Where does the wasteway  
21 structure cost fit into those cost categories  
22 that you gave Henry over the telephone?

23 A Okay, let me try to find it.

24 (Brief pause.

25 mesghinna-cross-white

1 A Okay. Let me read for you some items because  
2 wasteway has several costs, many different  
3 kinds of costs.

4 Q Let me ask you, are they lumped together any-  
5 where in here?

6 A Yeah, I'll give you, if you just -- Okay.  
7 Let's check, for example -- Let's take in a  
8 wasteway you have excavation cost, cost of  
9 excavation is in those excavation for structures.  
10 You have back field, back field for structures.  
11 There must be an item, I guess for back field.

12 Q Item 6?

13 A Yes. And then there is back field item -- I  
14 mean compaction item.

15 THE SPECIAL MASTER: Compaction?

16 THE WITNESS: Yes, for structures. And  
17 then there is reinforced concrete, concrete  
18 structure.

19 THE SPECIAL MASTER: Reinforcement,  
20 steel and cement?

21 THE WITNESS: Uh-huh, yes. Do you have it?

22 Q (By Mr. White) Yes, Wold.

23 A The other one I have said earlier, unit pipe-  
24 lines, so you have pipeline costs. Some part

25 mesghinna-cross-white

1 of it is included in the pipeline cost.

2 The other thing, you might need a gate,  
3 metal gate, and the metal gate has its own  
4 item, it's in the items that I have given  
5 you. And then you have also riprap, riprap  
6 material. When the water comes out from the  
7 wasteway, when it gusts out, we don't want  
8 to destroy the creeks and so on, the  
9 environment of the creeks, so we put rocks  
10 of riprap.

11 THE SPECIAL MASTER: Riprap?

12 THE WITNESS: Yeah. So it includes all  
13 this, the wasteway includes all this.

14 THE SPECIAL MASTER: I have a question  
15 that's glaring and has to be asked. Is the  
16 science of the construction irrigation system  
17 such that you can construct canals without  
18 the lining but you must have this reinforced  
19 concrete lining in the wasteways?

20 THE WITNESS: The reason why we have  
21 wasteways of concrete is because they will  
22 destroy the concrete -- I mean they will destroy  
23 the canal itself.

24 THE SPECIAL MASTER: That is because of  
25 mesghinna-cross-white

1 the flow, the volume of flow, once it moves  
2 in and it's gushing, a runaway type thing?

3 THE WITNESS: Of course. Because it's  
4 a very dangerous thing. What happens --  
5 why don't we discuss this so that it will be  
6 clear to all of us?

7 Suppose the electric energy is completely  
8 cut off, something happens to the generator  
9 or someone makes a mistake and so on. Then  
10 all the pumps will stop, but the canal is  
11 flowing, and if the water is not diverted to  
12 the pumps, the canal will flow and it will,  
13 by the time it goes more, it will be more and  
14 more water, and the canal cannot hold it any-  
15 more, so what happens is it will destroy the  
16 whole area and the canal will be destroyed.

17 So in order to be safe on this matter,  
18 what we do is in case these things happen, let's  
19 put a wasteway at some different sections of  
20 the canal. Then we --

21 THE SPECIAL MASTER: What planning is  
22 there in the contingency of that kind to get  
23 to the headgate as soon as you possibly can  
24 and cut the diversion, the main source?

25 mesghinna-cross-white



1 THE WITNESS: The faster you do it the  
2 better it is, really, because really it may  
3 not be -- it's not even good even though  
4 you have the wasteways, the effect is not good  
5 of that thing. I mean when the water goes  
6 down the stream it might destroy some fields  
7 and so on, you know, somewhere, you know,  
8 somewhere. So the faster we do it the better  
9 it is, and I believe --

10 THE SPECIAL MASTER: I think you explained  
11 that, it's the volume of water that requires  
12 it, it's the emergency nature of their use,  
13 I guess.

14 THE WITNESS: Exactly.

15 Q (By Mr. White) Did you say approximately ten  
16 percent of the diversions will be shunted  
17 through wasteways?

18 A Yes.

19 THE SPECIAL MASTER: Is that over a ten-  
20 year period?

21 THE WITNESS: No, no, no.

22 Q (By Mr. White) No? Well ten percent of what  
23 then?

24 A What we are saying is there will be ten percent  
25 mesghinna-cross-white

1 waste somewhere due to mismanagement, due to  
2 someone sleeping somewhere because he doesn't  
3 do his job, you know. This is unavoidable,  
4 and if you see the works of Midvale Irrigation  
5 District, you will see that thing there.  
6 Every year they publish this data. And --

7 THE SPECIAL MASTER: Of that which is not  
8 18 percent which will come back into your  
9 main flow.

10 THE WITNESS: It will be -- it will be  
11 used downstream; no water is really lost.

12 THE SPECIAL MASTER: No, in the state of  
13 nature that's true, no water is really lost.  
14 Even the seepage, the canal goes to feed the  
15 Wind River Alluvium and Lord knows that feeds  
16 a thousand wells someplace, so it's all  
17 creating some good for somebody. But it's not  
18 going to grow any crops.

19 THE WITNESS: That's true.

20 THE SPECIAL MASTER: And that decreases  
21 the efficiency of your system.

22 THE WITNESS: That's true.

23 THE SPECIAL MASTER: Not yet, maybe a 100  
24 years from now, 50 years.

25 mesghinna-cross-white

1 THE WITNESS: Probably, yes.

2 Q (By Mr. White) Dr. Mesghinna, what values  
3 or did you use a percentage of diversions  
4 to size your wasteways?

5 A Yeah, I have indicated it in my direct testimony,  
6 Mr. White, that I have used ten percent.

7 Q Wait a minute, I just asked you that and you  
8 said no.

9 A No, no. The purpose of it --

10 THE SPECIAL MASTER: A ten percent waste,  
11 and he explained what it was, and he said,  
12 no, he explained the difference.

13 THE WITNESS: Yeah, I --

14 Q (By Mr. White) Let me make sure I got it  
15 straight. You designed the wasteways to pick  
16 up ten percent of diversions?

17 A Unh-unh-unh, not only that. More than that.

18 Q Okay. What was the purpose of the design?

19 A Okay. Let me explain. It is better if I  
20 explain in the maps here.

21 THE SPECIAL MASTER: All right.

22 A I have a wasteway here in the Dry Creek. Let's  
23 assume something drastic happens in the area,  
24 the whole Wind River area. And let's say that

25 mesghinna-cross-white

1 the generator fails, so there is no electricity,  
 2 the pumps are not working. What happens?  
 3 The pumps will not take the water, it will be,  
 4 you know, closed, otherwise it will destroy  
 5 your pumps and so on. So the water will flow  
 6 in here, there will be additional flow that  
 7 comes in unless the water is diverted in each  
 8 of the pumps in here. The water that was  
 9 supposed to be diverted before the Dry Creek  
 10 Canal have to come, obviously have to come  
 11 through the canal if the canal can hold it. So  
 12 this canal is not -- this canal will not be  
 13 able to take all the water that comes from  
 14 there, so what we do is this water that was  
 15 supposed to be diverted by the pumps, we waste  
 16 this, including what we said also, the waste-  
 17 way, I mean the waste of ten percent. Because  
 18 what I am trying to say is the canal -- Let's  
 19 see, the canal is not -- does not have the  
 20 same size all the way. The more you go towards  
 21 the end it becomes smaller and smaller and  
 22 smaller, so it cannot carry the big flows that  
 23 850 c.f.s. is when it reaches in the middle  
 24 it. So if the pumps do not take that water, the

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1 flow, the water has to proceed, so before it  
2 proceeds to that, before it destroys the  
3 canal we have to waste it out, that's what I  
4 am saying.

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1 Q (By Mr. White) Having you prepare the design and  
2 calculation for the Dry Creek wasteway?

3 A Yes, sir.

4 Q Can I look at that, please?

5 MR. CLEAR: Your Honor, maybe we should take  
6 a ten minute break or break for today. He's been  
7 on a long time for the --

8 THE SPECIAL MASTER: What do you think,  
9 gentlemen, do you want to go to 5:00 or do you  
10 want to wind up in a few minutes?

11 MR. WHITE: My guess is I've got about ten  
12 minutes left and then tomorrow we'll bring in  
13 those exhibits. I was going to suggest, Your  
14 Honor, that we try to break, oh, within the  
15 next ten or fifteen minutes for the day.

16 THE SPECIAL MASTER: Let's work till 4:15  
17 and call it a day.

18 MR. WHITE: Then call it a day.

19 THE SPECIAL MASTER: Okay. We'll go for  
20 another fifteen minutes.

21 (Off the record discussion.

22 THE WITNESS: What I am trying to say, let's  
23 see, how many pumps are there before Dry Creek.

24 Let me see.

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1 A Okay. What I'm trying to explain is we have a  
2 wasteway at Dry Creek and I believe the pump,  
3 the last pump station is pump station number  
4 thirteen. So starting the water, the water that  
5 comes for pump one up to pump thirteen, pumps  
6 one, two, three, four, up to pump thirteen in  
7 case the electricity is shut off the pumps here  
8 are not going to take that water. They will be  
9 shut off. So the water that comes in here can-  
10 not pass through this siphon. The siphon is not  
11 designed to take that water. So before it reaches  
12 the siphon we have to build a wasteway that will  
13 take out these flows.

14 Also the wasteway -- the waste, the amount  
15 of waste that is supposed to go -- I mean assigned  
16 for this acreage in here will go out through the  
17 wasteway so that --

18 Q You've got two amounts that you add up?

19 A Yeah.

20 Q Okay.

21 THE SPECIAL MASTER: I see.

22 Q (By Mr. White) In addition to the riprap that  
23 you described, what other channel protection  
24 features do you have? Let's take, for example,  
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24-3

1 Dry Creek below your wasteway.

2 A I think that's a good question. As you know  
3 Dry Creek is almost, we can call it, a wet  
4 creek. You know, almost --

5 Q A what creek?

6 A Wet. Wet, it has water.

7 THE SPECIAL MASTER: Almost year round?

8 THE WITNESS: Yeah.

9 A And the amount of water that we divert as waste  
10 to that canal is probably one-eighth or one-  
11 seventh of the peak flows that flows through  
12 that creek. So we're talking really a very small  
13 amount of water as compared to the nature -- natural  
14 flow that flows through it. So we didn't fail to  
15 put any protection through all that canal.

16 However, in Five Mile Creek we have gone a  
17 long way to protect the area because we found it  
18 necessary to put riprap and also a long pipelines  
19 to the area.

20 Q Was your channel protection work on the Five Mile  
21 Creek similar to that that was done below the  
22 Wyoming Canal and Five Mile Creek, are you  
23 familiar with that work?

24 A I am not really familiar.

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1 Q Dr. Mesghinna, --

2 A Yes.

3 Q Drainage again.

4 What are the dimensions which you used for  
5 the open drains and outlet ditches, specifically  
6 what are your bottom widths?

7 A I can tell you the depth which is more important,  
8 I guess.

9 Q Okay. Do you -- but you can't tell me the bottom  
10 width?

11 A But I can tell you but I have to go through a long  
12 thing.

13 THE SPECIAL MASTER: Do you want to save it  
14 until tomorrow?

15 THE WITNESS: I can tell it.

16 Q (By Mr. White) Well, why don't you tell me  
17 tomorrow and then we'll finish tonight by saying  
18 you told me this morning that you could provide  
19 a tabulation of field by field dimensions and  
20 acreage and you have that, is that correct?  
21 So we don't have to go through that --

22 A Uh-huh.

23 Q -- is that right?

24 A Yeah, I have said that.

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1 Q And you showed me this afternoon a portion of  
2 your notebook for North Crowheart that all the  
3 information you needed on pipes, and you said you  
4 had similar sections for each of the other units,  
5 is that correct?

6 A Yeah, but are you asking me to give you that?

7 Q No, I'm asking you to give it to me -- you have  
8 given us some of it but certainly not all of it.

9 A Oh, my gosh. No way.

10 THE SPECIAL MASTER: How many pages will  
11 that involve?

12 THE WITNESS: It is -- this is talking almost  
13 about this whole book.

14 MR. WHITE: We are going to copy it, Your  
15 Honor. It is not going to be any difficulty.

16 THE WITNESS: No matter what, I have given  
17 you all the necessary things to do this.

18 MR. WHITE: Well, Dr. Mesghinna --

19 THE SPECIAL MASTER: Talk to your lawyers  
20 on that.

21 MR. WHITE: Dr. Mesghinna, the point is you  
22 keep saying you have given us the necessary things  
23 to do the calculations ourselves. What I'm saying  
24 is I want to see the calculations and the results

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1 that you have made and that's why I'm asking the  
2 Court --

3 THE SPECIAL MASTER: What he's also saying  
4 is apparently other witnesses have apparently given  
5 him a lot more than you have as we saw yesterday.  
6 If I may inject a point of humor toward the end  
7 of a weary day.

8 All right. Next, Mr. White.

9 MR. WHITE: And I think you also indicated  
10 that -- let's see, you've got the graph out on  
11 your pumps and pumping plant. Do you have a  
12 wasteway design for each wasteway that you in-  
13 cluded such as --

14 THE SPECIAL MASTER: Wasteway design?

15 MR. WHITE: Yes, sir. Such as the two-  
16 page wasteway design that you had and the calcu-  
17 latipns you had for the Dry Creek wasteway that  
18 you showed me?

19 MR. CLEAR: Your Honor, this trial is turning  
20 into a discovery proceeding. --

21 MR. WHITE: Wait a minute.

22 MR. CLEAR: I think we gave them everything  
23 conceivable.

24 THE SPECIAL MASTER: It may be and if it is,

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1 we'll do our best to bring it back in line. .

2 The question was on the wasteways.

3 MR. WHITE: Yes, sir. He's testified  
4 that there are wasteways which are not shown --

5 THE SPECIAL MASTER: And you have asked  
6 him, does he have a design for the wasteways  
7 and that's a fair enough question.

8 A We have a design but this design is based on ex-  
9 perience and knowledge of a company that is com-  
10 peting with other companies.

11 THE SPECIAL MASTER: So you get the work  
12 if the work is ever given --

13 THE WITNESS: Yeah. I mean --

14 THE SPECIAL MASTER: All right. I under-  
15 stand that that's probably why Mr. White wants  
16 to know.

17 MR WHITE: I want to know whether or not  
18 I can see and copy your wasteway designs that  
19 are included within the plans that you testified  
20 about here in court.

21 THE WITNESS: I can give you the results of  
22 it as to whatever you want in terms of how much  
23 concrete, how much excavation and so on but the  
24 design is something that I think is life and

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1 death for us.

2 THE SPECIAL MASTER: He may be saying to you  
3 that we lawyers are -- Gimble's never tells Macy's  
4 is what he's telling us.

5 MR. WHITE: Well, what I'm saying, Your Honor,  
6 is if he included that design in the project that  
7 he's testifying about whether he's real proud  
8 of it or not, I'm entitled to see that design.

9 THE SPECIAL MASTER: That may not be true,  
10 Mr. White. We'll go into that tomorrow.

11 MR. WHITE: I'm asking for it now.

12 THE SPECIAL MASTER: You're entitled to  
13 know the amount of concrete in it and the amount  
14 of component parts in it, but you are not entitled  
15 to look at it.

16 MR. WHITE: The design that he is using?

17 THE WITNESS: Sure.

18 THE SPECIAL MASTER: It might be the same --

19 THE WITNESS: The same thing with the pipe  
20 lines. I can give you the results; I can give you  
21 anything but --

22 THE SPECIAL MASTER: The number of feet and  
23 the size, you know.

24 MR. WHITE: Are you saying, Your Honor, that

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1 you will not allow me to see the design of the  
2 wasteways?

3 THE SPECIAL MASTER: I'm saying I'm going  
4 to have to anticipate there are going to be some  
5 vigorous objections to your seeing it and we'll  
6 have to look at the arguments. And it is probably  
7 the case this will become a proprietary matter which  
8 can make it --

9 MR. WHITE: I want to make sure we make a  
10 record on that.

11 THE SPECIAL MASTER: I'll let you make a  
12 record on it because I could be wrong but I could  
13 be right.

14 THE WITNESS: The same thing on the pipes.  
15 I have given you almost everything really in  
16 fact I gave you the pipeline layout. I think  
17 it is a simple matter of using calculators and  
18 I gave you all the equations, you see, to come  
19 up with that.

20 MR. WHITE: What you're saying, Dr. Mesghinna,  
21 is isn't this correct --

22 THE WITNESS: And he --

23 MR. WHITE: -- you gave us enough informa-  
24 tion that we can by calculating come up with the

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1 same results you did?

2 THE WITNESS: Of course you can.

3 MR. WHITE: But you're not willing to give  
4 us the results that you came up with?

5 THE WITNESS: The point is, you see, there  
6 are -- in design there are many, what shall I say --

7 THE SPECIAL MASTER: Trade secrets.

8 THE WITNESS: Trade secrets that we use and  
9 we have especially, really on this thing, pipeline  
10 network and so on --

11 THE SPECIAL MASTER: The request also, Mr.  
12 White, would have to be considered in light of  
13 the evidence and what I do so far by way of the  
14 obtaining of information, the months and months of  
15 depositions and the mountains of material already  
16 in the record, and it all adds up to the fact that  
17 there has been an awful lot of material obtained  
18 already.

19 MR. WHITE: It will make it a lot easier,  
20 Your Honor, if you just rule tonight that I could  
21 not have his pipe network design, and I couldn't  
22 have his wasteway design. We wouldn't have to  
23 argue about it tomorrow.

24 THE SPECIAL MASTER: What stage of design are  
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1 we if he's already concluded on a page or two  
2 of the report that these are generalizations  
3 made about them? You're entitled to those --  
4 if you want to know how much material of each  
5 kind, you're entitled to that. You're entitled  
6 to peripheral material but a design regarding  
7 that wasteway -- if there is a specific design  
8 of those wasteways by this company and them and  
9 your consultant both anticipate to get this  
10 business and if and when the day ever comes when  
11 the Tribal Counsel decides they want to build  
12 this project, which in itself is a question, I  
13 can see the point that they are going to raise  
14 objections to delivering you the design specifi-  
15 cations.

16 I don't think you've gone as far as working  
17 prints yet by any means. If there were then I  
18 know I would have to deny them. So it is a case  
19 of where are we on the scale between conceptual  
20 discussions of designs and working papers ready  
21 for the first construction phase.

22 MR. WHITE: Your Honor, I would like you  
23 to look at the Dry Creek wasteway design pages  
24 and calculation pages which Dr. Mesghinna

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1 showed them --

2 THE SPECIAL MASTER: Has already provided  
3 you --

4 MR. WHITE: -- showed it to me and I think  
5 you will see what I'm talking about. What it  
6 does, it shows the general shape and what went  
7 into it. I think we are entitled to look at them.  
8 I think you would --

9 THE SPECIAL MASTER: Have you answered?  
10 You've already showed them to me?

11 THE WITNESS: Yeah, I have showed them to  
12 you.

13 THE SPECIAL MASTER: You've already seen  
14 it.

15 THE WITNESS: Okay. Let me make things  
16 easier for you. How about if I give you -- I  
17 don't know if my lawyers will --

18 THE SPECIAL MASTER: Will let you.

19 THE WITNESS: -- will let me do it. How  
20 about if I give you all the amount of concrete,  
21 the amount of riprap material, the amount of  
22 excavation, everything that enters into each  
23 wasteway that you want. Do you want that too?

24 MR. WHITE: I would like that but I want --

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1 THE SPECIAL MASTER: You see, Mr. White,  
2 what has that got to do with whether or not the  
3 reservation is entitled to a right of water on  
4 this area? What difference does it make what  
5 the design is of the wasteways? That's why I  
6 think you're reaching into areas that are a far  
7 departure from the reference to me from Judge  
8 Joffe --

9 MR. WHITE: Well, let me tell you why, Your  
10 Honor, let's take wasteways as an example or we  
11 can take pipe networks --

12 THE SPECIAL MASTER: That's exactly what  
13 we're talking about, the wasteways plans. It  
14 is not an example, it is a fact.

15 MR. WHITE: Let's assume that the wasteway  
16 that's designed for Dry Creek that we talked about  
17 is perfectly adequate, no problem.

18 THE SPECIAL MASTER: Perfectly adequate?

19 MR. WHITE: We say there's no problems with  
20 it, it is perfectly adequate and the costs associ-  
21 ated with it are reasonable. But let's assume  
22 on the other hand that if we are allowed to look  
23 at that design, we would say that design has got  
24 one of two problems with it, either the design

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1 is inadequate and therefore the costs are low or  
2 the design is adequate but there is a gross  
3 underestimation of the amount of material and  
4 the amount of work that goes into the construction  
5 of that wasteway, and therefore the costs are in-  
6 adequate. It all ties into the costs, Your Honor,  
7 and without looking at the design there is no way  
8 to critique the costs used by Dr. Mesghinna and  
9 it's the costs that go into the economic portions  
10 of the analysis that gets to --

11 THE SPECIAL MASTER: Well, let's resume in  
12 the morning at 9:15.

13 We stand adjourned for the day.

14 (Recess, 4:16 p.m.)

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