

1 IN THE UNITED STATES DISTRICT COURT
 2 FOR THE DISTRICT OF NEW MEXICO
 3
 4 UNITED STATES OF AMERICA,
 5 and
 6 STATE OF NEW MEXICO ex rel. No. 01-cv00072-MV/WPL
 STATE ENGINEER, Plaintiffs,
 7 vs. ZUNI RIVER BASIN
 ADJUDICATION
 8 A & R PRODUCTIONS, et al., Subfile No. ZRB-2-0038
 9 Defendants.
 10
 11
 12
 13 ORAL DEPOSITION OF CRAIG FREDRICKSON
 July 6, 2016
 9:00 a.m.
 1011 Indian School Road, Northwest
 Room 282
 Albuquerque, New Mexico
 16
 17
 18 PURSUANT TO THE NEW MEXICO RULES OF
 CIVIL PROCEDURE this deposition was:
 19
 20 TAKEN BY: MR. ANDREW "GUSS" GUARINO, ESQUIRE
 ATTORNEY FOR THE PLAINTIFFS
 21
 22
 23
 24 REPORTED BY: DIANNA M. ALVAREZ, NM CCR #141
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 25

1 **A P P E A R A N C E S**
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 5 Denver, Colorado 80202
 6 For the Plaintiff State Engineer:
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 Post Office Box 25102
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 10 For the Defendant:
 11 MR. CRAIG FREDRICKSON
 Pro Se
 12 2742 Veranda Road, Northwest
 Albuquerque, New Mexico 87107
 13
 14 Also Present:
 15 Mr. Mirko Kruse
 Mrs. Regina Fredrickson
 16 Scott Turnbull, telephonically
 17
 18
 19 **I N D E X**
 20 EXAMINATION OF CRAIG FREDRICKSON
 21 By Mr. Guarino 4
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EXHIBITS	INITIAL REFERENCE PAGE
A Zuni River Basin Hydrographic Survey, Sub-Area 10, Subfile Number: ZRB-2-0038, Sheet 1 of 1, NRCE	36
B Document, Expert Witness Report of Craig L. Fredrickson Pursuant to Federal Rule of Civil Procedure 26(a)(2), June 27, 2016	45
C Topographic Map, Rincon Hondo	76
D Document, Expert Witness Report of Craig L. Fredrickson Pursuant to Federal Rule of Civil Procedure 26(a)(2)(B), April 12, 2016	103
E Document, Water Intake Rates of Cattle, C. F. Winchester and M. J. Morris, U. S. Department of Agriculture, Pages 722-740	110
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1 **CRAIG FREDRICKSON**
 2 after having been duly sworn upon oath, was questioned
 3 and testified as follows:
 4 **EXAMINATION**
 5 **BY MR. GUARINO:**
 6 Q. Mr. Fredrickson, let's go over the basics to
 7 make sure we understand for the record. Have you ever
 8 had your deposition taken before?
 9 A. Yes.
 10 Q. When was that?
 11 A. Approximately 1995.
 12 Q. And what was that in regards to?
 13 A. A business case.
 14 Q. Involving your business?
 15 A. Yes.
 16 Q. Were you deposed as a witness or an expert
 17 witness, were you hired for that case or was that your
 18 own case?
 19 A. That was my own case.
 20 Q. Okay. Well, it's been a little time since
 21 you've had your deposition taken. So that we're clear
 22 on how we operate in this deposition, as you know from
 23 sitting in on Mr. Cox's deposition, it's a question and
 24 answer format. I ask the questions and you answer the
 25 questions to the best of your ability.

1 Would you please state your full name for the record.
 2 A. My name is Craig Landis Frederickson.
 3 Q. And where do you live, Mr. Fredrickson?
 4 A. My home is in Albuquerque at 2742 Veranda
 5 Road, Northwest.
 6 Q. How long have you lived there?
 7 A. Since 1979.
 8 Q. How old are you?
 9 A. I am 64.
 10 Q. Besides your primary residence, do you own
 11 real property?
 12 A. I do.
 13 Q. Can you tell me where, describe it a little
 14 bit.
 15 A. I own a small piece of land in the South
 16 Valley of Albuquerque.
 17 Q. Is that a residence or is that open land, what
 18 sort of land is that?
 19 A. It's agricultural land and we're building a --
 20 an adobe house on that property.
 21 Q. Are you operating it as agricultural land or
 22 do you just have it as a building site for a home?
 23 A. It's being operated as agricultural land with
 24 a portion of it a construction site for this adobe
 25 house.

1 Q. How many acres is it?
 2 A. Two.
 3 Q. What sort of agricultural activity is going on
 4 there?
 5 A. Fruit trees, alfalfa fields, annual ryegrass,
 6 various vegetable crops.
 7 Q. How long have you had that piece of property?
 8 A. Approximately two years.
 9 Q. And are you leasing that property to someone
 10 for the agricultural activities or are you doing this
 11 work yourself?
 12 A. We're harvesting the alfalfa and ryegrass and
 13 baling it and selling that to farms, horse ranchers,
 14 cattle ranchers in the area.
 15 Q. So you've described this piece of property in
 16 south Albuquerque, a residence that we know of, do you
 17 have any other real property that you own?
 18 A. I do.
 19 Q. Where is that?
 20 A. It's in Western Cibola County.
 21 Q. In the basin?
 22 A. Within the Zuni River Basin. And it's a 640
 23 acre section, approximately 640 acre section of land,
 24 within what's known as the -- what's known as the Rincon
 25 Hondo Canyon.

1 Q. Do you own any other pieces of property? I'm
 2 counting three at this point, do you have any other
 3 pieces of property?
 4 A. No, I don't.
 5 Q. Besides your residence that you may have lived
 6 in in the past and you may have owned here in
 7 Albuquerque, have you owned other pieces of real estate
 8 besides the three that you've just described?
 9 A. No.
 10 Q. Okay. Can you tell me, just give me a little
 11 bit of background about yourself, Mr. Fredrickson.
 12 Where were you born, where did you grow up, where did
 13 you generally live in the country?
 14 A. I was born in New Haven, Connecticut, as a
 15 consequence of my -- my grandmother living there. I
 16 grew up in the Piedmont of North Carolina, went to
 17 school in Pennsylvania. Started my career in
 18 Pennsylvania and moved to Albuquerque in 1979.
 19 Q. What brought you out to Albuquerque, New
 20 Mexico?
 21 A. My job.
 22 Q. And back then who were you working for?
 23 A. I was working for Westinghouse Electric.
 24 Q. From the materials that you provided me, my
 25 understanding is that you retired in 2000?

1 A. Thereabouts, correct.
 2 Q. Have you worked in employment or have you been
 3 employed since then or done any work since then or have
 4 you been completely retired?
 5 A. I haven't done any work for pay.
 6 Q. Okay.
 7 A. And I've -- I've been involved in various
 8 things.
 9 Q. Okay.
 10 A. I should say I -- I have been employed. I'm a
 11 musician, a violinist. I've played with a couple of
 12 symphonies, including the Roswell Symphony and the
 13 Albuquerque Philharmonic. In the former case I did get
 14 paid for that. And after I retired from that I also
 15 have been on the Board of the Public Lands Group, Public
 16 Lands Interpretive Association. But my services have
 17 been provided pro bono. And I continue to work with
 18 them, although I'm not currently on the Board, in the
 19 management of campgrounds on the south side of the Grand
 20 Canyon.
 21 Q. What nonprofit are you on the Board of?
 22 A. Public Lands Interpretive Association.
 23 Q. So is it fair to describe since 2000 you've
 24 been retired but you've been active?
 25 A. Correct.

1 Q. Now, according to the materials you provided,
2 it seems that you were educated and trained as a nuclear
3 engineer and graduated in 1973; is that correct?

4 A. Yes.

5 Q. Good. Can you tell me a little bit about the
6 course work to become an engineer, a nuclear engineer
7 particularly.

8 A. The course work involved general engineering
9 courses in the areas of fluid mechanics, thermal
10 dynamics, statics, electrical engineering, fluid flow,
11 fraction mechanics, nuclear physics, nuclear engineering
12 facility design, regulatory analysis.

13 Q. That's a four-year program?

14 A. Four-year program.

15 Q. Did you do any graduate work?

16 A. Not for credit.

17 Q. What sort of graduate work did you do, even
18 for noncredit, formal training?

19 A. Business related courses.

20 Q. You didn't get an M.B.A. or anything like
21 that; did you?

22 A. No.

23 Q. Do you have any other areas of formal
24 education or training that are generally described by
25 your nuclear engineering, business related courses?

13

1 A. Mostly just on-the-job experience, training
2 associated with my various responsibilities as I moved
3 from position to position.

4 Q. Now, when you retired, you were working for
5 Benchmark Environmental. Tell me about them, just a
6 little bit. How long were you with them, what did they
7 do, that sort of thing?

8 A. Well, I was one of the co-founders of the
9 company. In 1989 we founded the company for the
10 purposes of providing environmental consulting services
11 and related to defense facilities including nonreactor
12 nuclear facilities. Pretty much covering the water
13 front of environmental compliance issues associated with
14 such laws as the Clean Water Act, Clean Air Act,
15 National Environmental Policy Act, Resource Conservation
16 Recovery Act, CERCLA, TSCA, acronyms for various other
17 Acts. The Atomic Energy Act, those types of regulatory
18 issues facing contractors primarily with the Department
19 of Energy but also with the Department of Defense, Corp
20 of Engineers and the private companies as well.

21 Q. Can you tell me what a nonreactor nuclear
22 facility is?

23 A. A nonreactor nuclear facility is a facility
24 that is not a nuclear reactor but handles nuclear
25 material. Such as a plutonium processing facility, for

14

1 example, used in weapons production or a heat source
2 plutonium facility for making heat sources for use by
3 NASA, things of that nature.

4 Q. Okay. Does that include things such as -- I
5 know in New Mexico they have WIPP down south, is that
6 another example of this sort of facility?

7 A. It is.

8 Q. So you were the president for them. How large
9 was this operation Benchmark Environmental?

10 A. At our largest we were approximately 80
11 employees with various offices, mostly within the state
12 but outside the state as well.

13 Q. Do they still exist?

14 A. Not under that name.

15 Q. What name do they exist under now?

16 A. Last I know of, they existed under the name
17 Eberline Environmental.

18 Q. And when you were working for Benchmark, you
19 were President and founder, what were your job
20 responsibilities for the company?

21 A. Pretty much everything.

22 Q. Okay.

23 A. I was the C.E.O., I was the Chief Financial --
24 Financial Officer. I managed all the accounting, I
25 wrote the quality assurance program and administered

15

1 that. I over -- I developed and oversaw the -- the
2 401(k) plan for the company. I wrote the employee
3 manual for the company and oversaw the human resources
4 department.

5 I managed the -- a group of health physicists
6 and nuclear engineers that I had on staff to support
7 that aspect of our operations. I did technical
8 analysis, interfaced with the clients, I wrote their
9 proposals, I did the cost estimates. Pretty much a
10 whole range of responsibilities that come with a small
11 engineering company.

12 Q. And so in your Resume you describe that the
13 projects that your company were involved in was facility
14 safety, waste, and regulatory compliance. That's your
15 description, I believe, is that description of the work
16 that Benchmark would sort of --

17 A. That -- that pretty much captures it.

18 Q. Okay. Backing up just a little bit more.
19 Between 1973 and 2000 you worked, in reverse order, with
20 Benchmark, (IT) Corporation, the Department of Energy,
21 Westinghouse. That's what I've gathered from your
22 resume. These were all full-time positions?

23 A. Correct.

24 Q. Okay. And did you have any other employers
25 between 1973 and 2000?

16

1 A. I wasn't employed during -- directly for any
 2 other employers. I did provide consulting services.
 3 Q. Self-employed?
 4 A. In a -- in a way. For example, I worked for
 5 Oak Ridge Associated University under a separate
 6 contract that took me to various Department of Energy
 7 facilities within the weapons complex. And where -- and
 8 where -- whereby I participated in operational and
 9 safety reviews of those facilities.
 10 Q. Okay.
 11 A. So contracts of that nature, but I wasn't
 12 employed directly by those.
 13 Q. And that was a part of your full-time work,
 14 that was not in addition to your full-time work?
 15 A. Correct.
 16 Q. And how long did that go on, throughout your
 17 career, those sorts of projects, or was it a specific
 18 time?
 19 A. Approximately 1985 through 1993.
 20 Q. And these were all within the field of your
 21 full-time employment, right, with facility safety,
 22 waste, nuclear waste, regulatory compliance, that sort
 23 of thing?
 24 A. Correct.
 25 Q. So it was consistent with your full-time work?

17

1 A. Yes.
 2 Q. Any gaps in employment between '73 and 2000?
 3 A. No.
 4 Q. Besides your employment did you have any
 5 significant sources of income than what's been described
 6 in your resume?
 7 A. No.
 8 Q. During the course of your professional career,
 9 between '73 and 2000, did you issue any articles of
 10 publications in your field?
 11 A. Not as a sole author.
 12 Q. But you did co-author pieces?
 13 A. I co-authored numerous reports that -- but
 14 none of which -- with perhaps a couple of exceptions,
 15 none of which were authored for public use, they were
 16 compliance systems associated with -- with the
 17 facilities or operations that we -- or I was involved
 18 with. So, for example, a safety analysis support of a
 19 facility or fire hazard analysis for a facility.
 20 Q. Let me be a little bit more clear. I
 21 understand throughout the course of your engineering
 22 career you've worked on probably numerous projects,
 23 numerous reports for those projects. I'm talking more
 24 in the sense of publications as outside of your
 25 immediate projects, duties and projects, deliverables.

18

1 Do you have any journal or periodical publications that
 2 might appear? It doesn't sound like it but --
 3 A. No.
 4 Q. Okay. Let me just ask you, before 2000, and
 5 besides any water rights that might be associated with
 6 your primary residence, whatever that might be, have you
 7 ever owned a water right before?
 8 A. Not that I recall.
 9 Q. And you described that you've got two acres of
 10 land down in southern Albuquerque that you have some
 11 agricultural activities going on. Before 2000, have you
 12 ever raised crops or livestock?
 13 A. Yes.
 14 Q. Can you describe that, please.
 15 A. Well, when I lived in Pennsylvania. For
 16 example, we lived on a farm and we produced crops for
 17 our own consumption. Our neighbor ran cattle, had a
 18 cow-calf operation, the family that owned the farm that
 19 we were living on. But other than chasing the cows out
 20 of the garden, we didn't have much involvement with
 21 them.
 22 Q. And when did this occur?
 23 A. Between 1975 and 1979.
 24 Q. '75 and '79?
 25 A. Correct.

19

1 Q. So you were leasing a home on a farm at that
 2 time?
 3 A. A farmhouse.
 4 Q. A farmhouse?
 5 A. On a farm.
 6 Q. And you had a garden there that you raised
 7 vegetables and things like that?
 8 A. Correct.
 9 Q. But you didn't have any livestock on that farm
 10 that was your livestock?
 11 A. No.
 12 Q. Okay. We're going to switch gears a little
 13 bit. I'd like to talk a little bit about your family.
 14 I understand that you're married, of course, Mr.
 15 Fredrickson. Do you have any children?
 16 A. I do.
 17 Q. How many children do you have, and what are
 18 their ages?
 19 A. Two children. Aged -- one was born in 1987
 20 and the other was born in 1989.
 21 Q. Okay.
 22 A. So --
 23 Q. Whatever that would be.
 24 A. And we're between birthdays right now.
 25 Q. Do they live here in Albuquerque with you?

20

1 Q. Are the conditions still in drought condition?
 2 A. I would say that in terms of climate, yes. In
 3 terms of -- of the -- the land itself, it's much
 4 improved.
 5 Q. These drought conditions, are there specific
 6 conditions that you're looking for that would signify to
 7 you that you're not in drought conditions or can you
 8 describe for me how your view of what drought conditions
 9 versus not drought conditions are, when will the drought
 10 end?
 11 A. My opinion?
 12 Q. Sure, that's what I'm asking.
 13 A. When annual average rainfall returns to a more
 14 normal rate from year over year, when snowfall also
 15 returns to a more normal rate year over year, and when
 16 the moisture content of the soil column returns to the
 17 -- to the land.
 18 Q. And these are conditions that you look for as
 19 a landowner, is this an expert opinion of yours in any
 20 way or is this as a landowner this is what you'd like to
 21 see?
 22 A. This is what I'd like to see based upon advice
 23 that we've gotten from the NRCS, as well as publications
 24 on matters like how to harvest water from dirt roads,
 25 things of that nature.

25

1 Q. Okay. Mr. Fredrickson, we're here about this
 2 property that you own in the Zuni River Basin. And if I
 3 recall correctly, and as I've written it down, it's
 4 Township 5 North, Range 18 West, right, Section 19?
 5 A. Correct.
 6 Q. You purchased it in 2006?
 7 A. Correct.
 8 Q. And who did you purchase that property from?
 9 A. From Ron and Claire Demaray.
 10 Q. And who were they?
 11 A. They were the then owners of the land. And my
 12 recollection is that Ron was retired from the Forest
 13 Service and Claire was a -- an archaeologist.
 14 Q. So you didn't purchase the property from Great
 15 Western?
 16 A. No.
 17 Q. This was an individual sale that you had?
 18 A. Correct.
 19 Q. Do you know if they purchased the property
 20 from Great Western?
 21 A. I believe they did.
 22 Q. When you purchased the property from the
 23 Demarays -- can you spell that so that I've got that.
 24 A. Demaray?
 25 Q. Yes.

26

1 A. D-e-m-a-r-a-y.
 2 Q. Okay. So when you purchased the property from
 3 the Demarays was there any house or anything on the
 4 property?
 5 A. Yes.
 6 Q. Did they build the house?
 7 A. Yes.
 8 Q. When you purchased the property from the
 9 Demarays were there any leases on the property; oil,
 10 gas, water, grazing, anything like that?
 11 A. Not at the time of our purchase.
 12 Q. Okay. Do you know how long they owned the
 13 property?
 14 A. Between five and six years.
 15 Q. Do you know if they purchased the property
 16 from Great Western Properties?
 17 A. I believe they did.
 18 Q. To your understanding, what sort of activities
 19 were going on when you purchased the property? How was
 20 the land being used?
 21 A. By the Demarays?
 22 Q. Yes.
 23 A. They were -- they had been reseeded the
 24 property.
 25 Q. Anything else?

27

1 A. They had conducted a couple of archaeological
 2 investigations on the property.
 3 Q. Anything else? Were they running cattle on
 4 the land?
 5 A. Not to my knowledge, not at the time we
 6 purchased it.
 7 Q. Now you heard a couple of weeks ago, when we
 8 were speaking with Mr. Cox in Roswell, Mr. Cox
 9 describing his cattle ranching operations. Based on Mr.
 10 Cox's description, he was describing cattle ranching
 11 activities that went on until about 2000. After 2000,
 12 are you aware of any ranching activities that were going
 13 on, on your property, this Section 19 in the Zuni River
 14 Basin?
 15 A. After 2000?
 16 Q. After 2000, yes.
 17 A. I am not.
 18 Q. Okay. When you purchased the property you
 19 described that there was a house already out there?
 20 A. Correct.
 21 Q. And what was your plan when you purchased that
 22 property? Were you planning to move out there or were
 23 you planning to have it as a second home, or what was
 24 your thought when you purchased it?
 25 A. The idea was mostly as a second home and to

28

1 have some land in a very rural part of the state that
 2 presented opportunities for future ranching, hunting,
 3 and various stewardships, opportunities for us to
 4 improve that property.

5 Q. Are you a hunter, Mr. Fredrickson?

6 A. I am.

7 Q. What do you hunt?

8 A. Mule deer and elk.

9 Q. Since you have purchased the property do you
 10 lease your property at all to hunters or anything like
 11 that, or do you not do that?

12 A. We have not done that as of yet.

13 Q. When you purchased the property with the house
 14 on it, what condition was the house in, did it need work
 15 or was it in pretty good shape?

16 A. It needed work.

17 Q. The house is not plumbed, as I understand it;
 18 is that correct?

19 A. It is plumbed but not to a water source. It
 20 -- it has a water tank at the -- at the site and it's
 21 equipped with, you know, sinks, a shower, a hot water
 22 heater, things of that nature.

23 Q. That's a good description of what I was
 24 referring to, plumb. I was referring to a connection to
 25 a water source. The house is otherwise designed and

29

1 built for operating plumbing and having the regular
 2 benefits of a modern home; is that right?

3 A. In a matter of speaking.

4 Q. So there's a water tank attached to the house.
 5 Do you know when the house was built itself?

6 A. Yes.

7 Q. When was it built?

8 A. 2001.

9 Q. And it was built by the Demarays?

10 A. Correct.

11 Q. Do you have plans to connect a water source to
 12 the house or not?

13 A. We don't -- we don't not have plans, we're not
 14 actively working on that at the moment.

15 Q. "We don't not have plans," does that mean
 16 you have plans?

17 A. No, it doesn't mean that we've -- it means
 18 that we have -- we're not working on a plan right now,
 19 that's not a priority at the moment.

20 Q. Is it fair to say that it's possible that you
 21 might connect to a water source in the future?

22 A. Yes.

23 Q. But you don't have any specific plans right
 24 now?

25 A. Correct.

30

1 Q. Okay. You've made several comments regarding
 2 wanting to ranch or raise livestock out there on your
 3 property?

4 A. Correct.

5 Q. Could you describe for me those plans or those
 6 thoughts that you've got.

7 A. Well, the idea is to take advantage of the
 8 current infrastructure on the property, including the
 9 wells and drinkers and -- and the windmill and the power
 10 source for pumping water, and some of the existing
 11 fencing.

12 Q. Is the property currently fenced to manage
 13 livestock?

14 A. Yes and no. There are some fences but fences
 15 do not extend or encompass the property boundary.

16 Q. The 640 acres?

17 A. Correct.

18 Q. So your 640 acres is not enclosed by a fence?

19 A. Correct.

20 Q. So these thoughts of having cattle or
 21 livestock on your property, are we talking about cattle
 22 or are we talking horses, are we talking llamas, what
 23 are you thinking?

24 A. Our initial thought was Jackrabbits. We're
 25 kind of overrun with Jackrabbits, but other than that --

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1 Q. Can you herd a Jackrabbit?

2 A. Good question. We -- we're really thinking
 3 about cattle. In fact, we had actually paid taxes on a
 4 cow in 2008, in anticipation that we would start at that
 5 time with ranching, but -- but never purchased the cow.

6 Q. Can you tell me how one pays taxes on a cow?

7 A. You're required by Cibola County to report
 8 livestock that you are anticipating on the land. And we
 9 anticipated that during the typical forage growing
 10 season that we would put some cattle on the land. And
 11 this was just to get ahead of the curve, if you will, in
 12 anticipation that that would happen.

13 Q. And that did not happen?

14 A. No, we chose not to do it at the time.

15 Q. So tell me what your time frame now is for
 16 having some livestock on the property.

17 A. Our plan at this point has been that once we
 18 have this water rights issue resolved and the land has
 19 improved to the extent that it supports a herd, that we
 20 could put cattle on this land and adjacent public lands
 21 through grazing leases and other private land connected
 22 to the property.

23 Q. So how many acres do you anticipate running
 24 cattle on and managing, that you're thinking?

25 A. Between 1,800 and 3,000.

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1 Q. And, Mr. Fredrickson, are these top of the
2 head notions that you had? I mean, have you taken any
3 action to secure permits or leases for other property
4 outside of the property that you own? Have you looked
5 into this at all?

6 A. I've looked at the current owners of grazing
7 leases for public land to the west and to the south.

8 Q. Okay. And who is that?

9 A. The grazing lease to the west is currently
10 owned by a neighbor, Ed Wagner. The current grazing
11 lease to the south, I believe, is owned by Carl Cox.
12 And then neighbors to the east property is owned by John
13 Davey.

14 Q. These are folks who own public land grazing
15 leases; is that correct?

16 A. The first two are, the third is a private
17 landowner.

18 Q. And when are the public grazing leases due to
19 expire for the public grazing that you've looked into?

20 A. I have looked into that, I have not been able
21 to get information on -- on that from the B.L.M. Socorro
22 office. Apparently, on my last inquiry, this was
23 considered confidential information.

24 Q. They told you it was confidential, they
25 wouldn't give you the information?

33

1 A. They wouldn't give me details about it. I was
2 particularly interested in what the base property was
3 for those leases. Typically B.L.M. requires that you
4 have base property where you have water in order to have
5 a lease on public land, B.L.M. land anyway. And the
6 only base property I was aware of was ours. So my
7 interest was in acquiring those grazing leases and using
8 our land and our water source as the base unit.

9 Q. Have you secured any livestock ranching
10 equipment to support this notion of raising cattle on
11 your property; gates, corrals, trucks, loaders, stuff
12 like that?

13 A. I have a tractor on the property.

14 Q. There's an image of that tractor in your
15 report; isn't there?

16 A. Yes.

17 Q. Okay.

18 A. I have -- and it has implements with it for --
19 to help make it useful. I have a couple of ATVs that
20 have been useful in rounding up stray cattle on the
21 property.

22 Q. You don't currently lease your property for
23 grazing; do you?

24 A. No.

25 Q. You described in your report, and mentioned

34

1 just now, strays. These are strays from someone else's
2 herd that comes onto your property?

3 A. Correct.

4 Q. How often does that happen?

5 A. Every year or two.

6 Q. One or two head?

7 A. Up to four.

8 Q. How do they get there, just wander in? It
9 sounds like it's an unfenced area.

10 A. There's a lack of complete fencing and many
11 fences are down as a result of dead trees falling over
12 fences. And the cattle will simply wander in, in search
13 of water.

14 Q. What percentage of your property of the
15 Section 19 square is fenced?

16 A. Three-eighths.

17 Q. To start a cattle operation of any kind or
18 raising livestock on your property, you would have to
19 fence the remaining five-eighths, do you anticipate?

20 A. Not necessarily.

21 Q. Okay. If you were to raise livestock on your
22 property, do you anticipate that you would have to live
23 there as a main residence as opposed to living in
24 Albuquerque or do you think you'll be able to do that
25 remotely? Let me just be fair, or have you thought that

35

1 part through?

2 A. I've considered it and I think we would have
3 to be there probably half time.

4 Q. You've never actually run cattle yourself,
5 have you, managed a cattle operation, had a herd? It
6 doesn't sound like you have.

7 A. My wife has, but I have not.

8 Q. Okay. So there is one well on the property,
9 Section 19, in the Zuni River Basin, is that my
10 understanding? Am I correct?

11 A. No.

12 Q. There's two wells?

13 A. There are two wells.

14 Q. On your property?

15 A. Correct.

16 Q. Where is your other well?

17 A. It's on the south side of the property, an
18 apparent association with an old homestead.

19 Q. Is it functional?

20 A. No.

21 Q. How far away from your house that is
22 functional with the stock tank, how far away is the old
23 homestead site?

24 A. Approximately three quarters of a mile.

25 (Exhibit A was marked for identification.)

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1 either images or video.
 2 Q. And why do you have game cameras setup?
 3 A. To understand who might be using the water
 4 source.
 5 Q. Are you providing water at your water source
 6 to make water available for wildlife, is that one of the
 7 things you want to do there?
 8 A. Well, that's part of it. We've also developed
 9 land adjacent to the corral for the purposes of growing
 10 western wheat seed for use in re-seeding the property.
 11 And we've done that successfully. And also we've
 12 watered -- we established three apple trees adjacent to
 13 the corral area which have not been as successful. We
 14 actually lost all three due to sub-zero temperatures.
 15 And we've also used that as a source of water for
 16 watering Ponderosa pines that we planted throughout the
 17 section.
 18 Q. So you've got wheatgrass seed, a couple of
 19 trees, apple trees, Ponderosas, and wildlife using the
 20 water right now?
 21 A. Correct.
 22 Q. In addition, when you're out there you haul
 23 water from that well, as I understand it, to put the
 24 water in the storage tank by the house?
 25 A. We have two storage tanks at the house; one we

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1 use in the wintertime that's indoors, and one that we
 2 use in the summertime that's outdoors. And we use that
 3 -- we haul water from that well location to the house.
 4 Q. Any other uses of the water since you
 5 purchased the property and going on today?
 6 A. Recreation purposes.
 7 Q. Cooling off on a hot day?
 8 A. Correct.
 9 Q. Okay.
 10 A. We've also used it for making concrete, for
 11 example, for repairs in the corral, washing down
 12 equipment as necessary, things of that nature.
 13 Q. Okay. So that I'm clear, so your primary
 14 residence is in Albuquerque and I think you described it
 15 before. Could you describe it, please, again, how much
 16 time do you actually spend out in the basin, how often
 17 do you visit? I know you've got game cameras out there,
 18 I assume you can monitor that remotely from Albuquerque?
 19 A. No, I can't.
 20 Q. Oh, really, you can't?
 21 A. No.
 22 Q. In today's age you can't?
 23 A. There is no electricity out there.
 24 Q. Okay.
 25 A. I installed a solar system so there is power

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1 available but there's no electrical lines, there's no --
 2 there's no phone service at that location, extremely
 3 remote and isolated.
 4 Q. Okay. So my question really is, so how much
 5 time do you spend out there?
 6 A. Up to half time.
 7 Q. So weekends, long weekends or any time?
 8 A. Any time, three or four days at a time.
 9 Q. Flexibility of retirement?
 10 A. Correct.
 11 Q. So can you help me understand a little bit,
 12 when do you foresee it's going to change, your use of
 13 the property, different activity, these notions of
 14 having livestock out there? What needs to happen for
 15 that to occur?
 16 A. First and foremost is a resolution to the
 17 water rights associated with the well.
 18 Q. Besides that.
 19 A. Probably the second most important issue is
 20 reaching a conclusion that the forage is sufficient to
 21 support X number of cattle per year.
 22 Q. And it's not there yet?
 23 A. I would like to see it in better condition
 24 than it is.
 25 Q. And, again, when you're saying "better

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1 condition," there's no specific criteria you're looking
 2 for, you're looking for some general sense of
 3 improvement to the land that you feel personally has
 4 been achieved? Is there any way to define it otherwise?
 5 A. Perhaps. For example, wheatgrass is now
 6 abundant in the lower areas and is a crop that we see
 7 growing starting in March. The grama grass that comes
 8 with the monsoon rain starting in July, some years it's
 9 been three feet tall, others years a foot tall,
 10 depending upon rainfall.
 11 And then a variety of other grasses; galleta
 12 grass, Alkali sacaton, buckwheat, muhly, silos, grama.
 13 There's a whole variety of grasses that are important to
 14 cattle that are out there and thrive or survive from
 15 year-to-year depending upon rainfall amounts.
 16 Q. And won't raising livestock on your property
 17 out there also result in a fairly significant change of
 18 lifestyle for you and your wife if you had to raise
 19 livestock out on your property?
 20 A. I don't imagine that it really would. We have
 21 the flexibility to -- to do different things at
 22 different times. And -- and I don't foresee a
 23 significant difference in -- in how we -- the time we
 24 spend there now versus then.
 25 Q. And how many livestock would you anticipate

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1 you would think about developing on or around your
 2 property in a livestock operation? Do you have any
 3 specifics on that yet?

4 A. No, not really.

5 Q. Okay, that's fine. We've been going about an
 6 hour, I'm going to switch over and start discussing some
 7 things that you raise in your report. It might be a
 8 good time to take a break, it would be fine with me if
 9 you wanted to, if you don't then we won't.

10 MR. BAGLEY: Actually, I could step down the
 11 hall for just a second.

12 MR. GUARINO: So why don't we take a
 13 five-minute break and we'll come back.

14 MR. BAGLEY: Thanks very much.

15 (The Deposition recessed at 10:10 a.m. and resumed at
 16 10:16 a.m. as follows:)

17 Q. (By Mr. Guarino) We're going to talk a little
 18 bit about your report now, Mr. Fredrickson. We're back
 19 on the record, you're still under oath. You provided a
 20 copy of your final version of your report on June 27 of
 21 this year; is that correct?

22 A. Correct.

23 (Exhibit B was marked for identification.)

24 Q. (By Mr. Guarino) I have a copy here and I've
 25 marked it as Exhibit B. I'd like you to take a look at

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1 it, I know you brought your own copy of your report.
 2 Can you just please make sure that it's a complete copy
 3 of your report. Make sure that's a clean copy too, I've
 4 got mine scribbled with notes.

5 A. It appears to be clean but it doesn't reflect
 6 the typos that I made you aware of.

7 Q. The errata are not in there, and so noted for
 8 the record, but I think we can carry on with those.

9 You've given me a copy here that you provided to me, I
 10 understand that that's part of your report.

11 A. Thank you.

12 Q. And if you do spot anything in this report
 13 that looks out of place we'll address that then. I'm
 14 not anticipating that will be a problem.

15 A. Okay.

16 Q. And that's now part of the record. All right.
 17 Now the title of your report you've listed is the
 18 "Expert Witness Report of Craig L. Fredrickson Pursuant
 19 to" the rules in this case. And in this report you have
 20 formulated a number of opinions; is that correct?

21 A. That's correct.

22 Q. This report contains all of the opinions that
 23 you have as it pertains to this subfile action in this
 24 adjudication?

25 A. It contains all the opinions that I have

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1 relative to the elements of water rights associated with
 2 livestock watering.

3 Q. Okay. And you intend, as I understand it, to
 4 present these opinions as they are captured within your
 5 expert report to the Court in support of your claims for
 6 water rights here?

7 A. That's correct.

8 Q. Can you specify your expertise in this case,
 9 what are you an expert in?

10 A. I'm an expert in conducting technical analysis
 11 based upon published data on a wide variety of issues.
 12 And by virtue of the scope of this report I made myself
 13 familiar with publications and data that is relevant to
 14 the topic of the elements of water rights associated
 15 with livestock watering.

16 I'm also -- I can consider myself an expert in
 17 terms of my knowledge of the infrastructure associated
 18 with the livestock watering facilities as well as
 19 windmill tanks, et cetera, on the property. And I am
 20 familiar, by virtue of our being on the land for the
 21 past 10 years, with the flora and fauna and topography
 22 of the immediate region around our property.

23 Q. Let's break that down just a little. Anything
 24 else, are you an expert on anything else?

25 A. Relative to this subfile action?

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1 Q. Yes. And in presenting your opinions here.

2 A. Not that I recall.

3 Q. Okay. Let me break this down into three areas
 4 and correct me if I haven't broken it down correctly.
 5 First, you described an expert in conducting technical
 6 analysis based on published data. Second, you identify
 7 yourself as an expert in knowledge about the
 8 infrastructure on your property. And next you describe
 9 yourself as an expert on the flora and fauna on your
 10 property and in the immediate region. Those are three
 11 areas that I understand that you hold yourself out as an
 12 expert on?

13 A. In -- in broad terms. I think I was a little
 14 more specific than that but, yes.

15 Q. Okay, let's use that as sort of a shorthand
 16 for now.

17 A. Okay.

18 Q. In this first area, conducting technical
 19 analysis based on published data, is this an area of
 20 scientific expertise?

21 A. I would say so.

22 Q. Okay. With respect to being expert in the
 23 knowledge of the infrastructure on your property, is
 24 this an area of scientific expertise or is this a
 25 reflection of your familiarity of what's on your

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1 property?

2 A. Both.

3 Q. And with regard to flora and fauna on your
4 property, the same question, is this an area of
5 scientific expertise or this is an area of simply being
6 familiar with what grows on your property?

7 A. I would say more in terms of familiarity with
8 the flora and fauna, the topography, the climate
9 conditions.

10 Q. Okay.

11 A. The natural environment.

12 Q. So the Resume that you attached to your
13 report, Exhibit B here, that's up to date, right? To
14 the extent that you got formal education and training,
15 professional experience, that sort of thing, that Resume
16 is up to date?

17 A. It captures my -- my career, if you will, as
18 an engineer.

19 Q. Okay. And, for example, on your Resume you
20 describe your technical expertise. It doesn't seem to
21 be in play in this case directly, in nuclear facility
22 safety, radioactive mixed waste risk assessment, and
23 regulatory compliance. That's what your Resume
24 described as your expertise but that's not really what
25 you're bringing to bear here; is it?

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1 A. Actually it is.

2 Q. Okay. Can you describe how?

3 A. My professional career was all about looking
4 at problems or challenges or facilities or operations
5 where I was required to review material, new references,
6 educate myself on -- on various aspects of an operation.
7 And evaluate such things as dispersion of material and
8 the environment to formulate source trends for
9 evaluating biological effects of contaminants, to look
10 at the various mechanisms by which such contaminants
11 could be taken up by the environment and transmitted to
12 man. But more fundamentally, to look at complex and
13 sometimes simple processes and do the math. In other
14 words, look at given X and given Y what is C.

15 Q. So in your field of nuclear engineering it's
16 an involved and complex field, correct? I mean, it's
17 what you just described?

18 A. Correct.

19 Q. And in your profession you were presented with
20 numerous problems and situations that you had to apply
21 your expertise and solve problems for your clients or
22 employer?

23 A. That's correct.

24 Q. And you brought those skills to bear on in
25 this case, generally speaking?

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1 A. That's true.

2 Q. You could bring them to bear in this case or
3 in another case of some unrelated field, whether it be
4 medicine or industry or environment or what have you,
5 you can bring these skills as an engineer to bear;
6 right?

7 A. Theoretically, yes.

8 Q. As a nuclear engineer you've described that
9 you've never been recognized as an expert in your field,
10 that you were never involved in litigation, it sounds
11 like, other than the business deposition that you had in
12 the 1990s. You were never presented as an expert in a
13 court of law?

14 A. Well, in a court of law, no. But in terms of
15 expertise, I was.

16 Q. To other people outside of it, in your
17 professional environment?

18 A. I'm sorry, I don't understand that question.

19 Q. You were presented as an expert, not in court
20 but in your field, in your professional environment or
21 weren't you?

22 A. Well, yes. Let me -- let me provide a little
23 explanation, for example.

24 Q. Sure, go right ahead.

25 A. For example, I was head of a American National

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1 Standards Institute Committee, evaluating the effects of
2 missiles associated with equipment failures or natural
3 phenomena on nuclear facilities. And I provided
4 consulting to the International Atomic Energy Agency on
5 atomic, and wrote the safety guide for nuclear
6 facilities throughout the world on -- on that topical
7 area. And I also provided testimony to the advisory
8 committee on reactor safeguards in Washington on various
9 topics related to operations of complex systems.

10 Q. Okay.

11 A. So in -- in that sense, I have provided, you
12 know, expertise that was beyond my normal work
13 requirement.

14 Q. Definitely in the field of your work
15 environment, nuclear engineering?

16 A. No, not just nuclear engineering. For
17 example, I was involved with developing the -- and
18 evaluating the effects of tornado generated missiles.

19 Q. On nuclear facilities.

20 A. On nuclear facilities and nonnuclear
21 facilities, on seismic issues, on qualification of
22 electrical equipment for environmental conditions and
23 seismic conditions on issues related to water hammer, on
24 issues associated with failure of turbine generators and
25 missiles they might be -- they might produce. On design

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1 of shielding and for equipment failures on -- on such
2 things as restraints for failed piping.

3 On evaluation of how equipment fails due to
4 rotational failure or -- or longitudinal or
5 circumferential failure of piping, to evaluation of --
6 of dispersion of contaminants in the air through calc
7 and dispersion modeling to hydrogeologic transport on
8 contaminants. A wide variety but --

9 Q. I think I get the idea.

10 A. -- but it's not -- it's not very little
11 associated with nuclear physics.

12 Q. I didn't say nuclear physics, I said nuclear
13 engineering.

14 A. Or nuclear engineering, per se. I was not
15 involved in the design of nuclear reactors, for example,
16 even though I was trained to do that.

17 Q. Just to be clear though, Mr. Fredrickson, your
18 field of professional experience is in the nuclear
19 industry. If I say nuclear engineering and you think
20 designing of a nuclear reactor, that's obviously not
21 what we're talking about and I don't mean to confuse you
22 in any way but your field was in the nuclear industry
23 and you were trained as a nuclear engineer. That's the
24 title that you gave in your Resume.

25 A. I was trained as a nuclear engineer and -- but

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1 the back of your report?

2 A. Correct.

3 Q. And you reviewed these publications in
4 response to the needs of this litigation; right?

5 A. That's true.

6 Q. Have you ever reviewed these publications
7 before this litigation popped up or outside the needs of
8 this litigation?

9 A. Some, yes.

10 Q. Can you tell me which ones and why?

11 A. Well, for example, in conducting airborne
12 dispersion modeling, I'm familiar with wind roses, with
13 meth data and how that's used, joint frequency of
14 distribution of indices and wind directions.

15 Q. Weather data?

16 A. Weather data.

17 Q. You've reviewed weather data before?

18 A. Absolutely.

19 Q. Okay. How about livestock management
20 practices or livestock watering techniques or wildlife
21 range practices or wildlife needs or anything like that,
22 did you review those before this litigation or as you
23 gathered this information as you were looking for
24 materials for your report?

25 A. Some of them. With respect to my interest in

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1 I applied my knowledge and experience to both nuclear
2 facilities and nonnuclear facilities.

3 Q. Let's get back to the report that you wrote in
4 this case. You prepared this report in response to the
5 needs of this litigation?

6 A. Correct.

7 Q. Have you ever formulated opinions like these
8 before?

9 A. That's a hard question to answer yes or no. I
10 would say, yes, in a way I have.

11 Q. How so?

12 A. Well, I've been tasked with answering
13 questions about how old a facility is, how it was
14 operated, what the consequences are of operation. And
15 in a broad sense, what we have here is a pretty simple
16 problem of cattle drinking water in response to thirst
17 and -- and using facilities that are engineered for that
18 purpose.

19 Q. You view this as an engineering problem that
20 can be solved?

21 A. Yes.

22 Q. In your report you cite to numerous
23 references, 41 by my count; is that fair?

24 A. That sounds about right.

25 Q. The ones that you rely on are all listed in

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1 -- in rehabilitating the land. For example, the
2 National Resource Conservation Service Range and Pasture
3 Handbook is a document that I was familiar with before
4 this litigation. As was the Soil Conservation Service,
5 the predecessor to NRCS, publication on -- on soil pipes
6 in our region. That was ancillary to our interest in
7 rehabilitating the land.

8 Q. Okay.

9 A. Also, the -- the -- I reference the -- the
10 Windmill Guide, Baker's Guide on Windmill Design because
11 I've conducted maintenance and repairs on that windmill.
12 So not all of those references are -- are -- are new to
13 me. Those that deal specifically with how much water a
14 cow drinks are ones that I became familiar with as a
15 consequence of this scope of work.

16 Q. Okay. And in addition to the ones that you
17 list here in your report, did you review other
18 publications that didn't make it into your report?

19 A. Yes.

20 Q. How many? Do you have a list of them, do you
21 have a sense of them? Tell me what you can recall.

22 A. I don't have a list but I would say at least
23 as many that are there, and maybe twice as many, you
24 know, maybe 40, 80 additional ones.

25 Q. You were familiarizing yourself in this

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1 area as --
 2 A. With the topic.
 3 Q. With the topic, as you were developing your
 4 expert report and that sort of thing?
 5 A. That's correct.
 6 Q. Is there any process that you had when you
 7 came across the publication, about whether you would use
 8 it or not use it?
 9 A. Yes.
 10 Q. Okay, tell me about that.
 11 A. Well, for example, there are many reports that
 12 I reviewed that dealt with the definition and evolution
 13 of the term Animal Unit. Some dating back to the early
 14 1900s that are no longer considered state of the --
 15 state-of-the-art, if you will, in terms of how that
 16 should be determined. Some that duplicated others I
 17 eliminated simply because they referenced other
 18 documents that I -- that I found that were actually
 19 source documents.
 20 So, for example, the -- the National Research
 21 Council report published by the National Academy Press
 22 on drinking water rates for cattle is something that's
 23 referenced in many, many reports. And duplicated
 24 therein. There's no need for me to look at those
 25 reports as source documents when I could go back to --

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1 Q. The original.
 2 A. -- the original. So I eliminated those. So I
 3 was trying to narrow down what was most relevant in
 4 terms of the topics at hand.
 5 Q. In your efforts to create this expert report,
 6 when did you start reviewing publications in earnest to
 7 develop your opinions associated with this expert
 8 report, when did that process start happening?
 9 A. 2006.
 10 Q. So you started working on this in 2006?
 11 A. I did.
 12 Q. This report?
 13 A. Not that report but in terms of reviewing
 14 references associated with it, yes.
 15 Q. Has your notions of water use or cattle
 16 utilization evolved over time since 2006 or would you
 17 describe yourself as being consistent with your
 18 opinions?
 19 A. My general opinions have stayed the same over
 20 that period of time.
 21 Q. And what are your general opinions?
 22 A. Well, my general opinion is that the methods
 23 and assumptions used by the State of New Mexico and the
 24 Department of Justice and their consulting engineers did
 25 not accurately reflect the water requirements for

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1 cow-calf operations in Cibola County.
 2 Q. Do you think the State of New Mexico and the
 3 Department of Justice were trying to estimate cow-calf
 4 water consumption in 2006?
 5 A. No.
 6 Q. Is it your belief that's what we were trying
 7 to do? What were we doing inaccurately, what was being
 8 done inaccurately that's your general opinion?
 9 A. I think that the assumption as to livestock
 10 water use, water intake per day of an Animal Unit, was
 11 incorrect. And I recognized that early on and made
 12 those -- made that known through my correspondence with
 13 the Plaintiffs on this subfile.
 14 Q. And you describe -- I don't mean to interrupt
 15 you, go ahead.
 16 A. Second, I also felt that the assumption about
 17 losses, consumptive and other losses associated with --
 18 with -- ancillary to livestock watering was unsupported.
 19 And I saw no -- I had no sense that it was a estimate
 20 that was based on anything but a pure guess. And I
 21 found that the stocking rate that was used for these
 22 calculations was too general and did not accurately
 23 reflect the variation in -- in stocking of rangeland in
 24 this part of the state.
 25 Q. Okay. Anything else?

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1 A. Not that I recall.
 2 Q. So I understand what you're saying, in 2006,
 3 and please correct me if I mischaracterize something.
 4 In 2006 you had several general opinions. Would you
 5 describe them as expert opinions or would you describe
 6 them as just your personal opinions?
 7 A. I would describe them as personal opinions
 8 based upon my initial review of the assumptions that
 9 went into their calculation.
 10 Q. And it was your belief then that the
 11 assumptions made associated with livestock water use,
 12 with losses associated with cattle operations, and with
 13 stocking rates were unsupported; is that a fair
 14 characterization?
 15 A. Yes.
 16 Q. Okay. Now, with respect to the opinions that
 17 you've developed since then, that are now reflected in
 18 your expert report, these opinions that you have
 19 reflected in your expert report, I think it's fair to
 20 say, you never made opinions like these associated with
 21 livestock and livestock operations, you've never made
 22 these sorts of opinions in an employment context, you've
 23 never been employed to make these? Do you understand
 24 what I'm saying? You've never been employed to make
 25 these sorts of opinions before, these are unique in that

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1 way; are they not?
 2 A. My opinions in this report are specific to the
 3 scope of investigation of the report.
 4 Q. So you've never been hired to make livestock
 5 water consumption opinions before?
 6 A. No.
 7 Q. And you've never taught in the area of cattle
 8 operations, livestock water consumption, wildlife water
 9 consumption, range management? You've never taught in
 10 these fields before; have you?
 11 A. No, I have not taught in those fields.
 12 Q. In these fields that I've just described, I
 13 hate to keep repeating them, but as they relate to the
 14 opinions that you have expressed in your expert report,
 15 I think we've established before that you haven't
 16 published an article, whether it was in the previous
 17 field of nuclear engineering, professional field or any
 18 other capacity; right?
 19 A. Correct.
 20 Q. Okay. And with regards to this area of cattle
 21 management, land management, range ecology, wildlife
 22 biology, you've never received any certifications or
 23 formal education around these specific areas; have you?
 24 A. I think that's fair, yes.
 25 Q. I think I heard you describe earlier, in

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1 A. There are two troughs that are not permanent.
 2 In other words, fixed to the ground, they're movable.
 3 Q. Okay.
 4 A. One is a rectangular box and -- excuse me, a
 5 rectangular tank. I repositioned that so that the
 6 overflow from the main storage tank flows into that.
 7 Q. Okay.
 8 A. And it provides a -- another source of
 9 drinking water for animals.
 10 Q. You heard Mr. Cox describe what was at the
 11 well before, it doesn't sound like those troughs were
 12 there when he was operating the land; do you agree with
 13 that?
 14 A. No, I don't agree in the sense that there's a
 15 lot of equipment there that he didn't mention, for
 16 example, the two old windmill pumps. There's a whole
 17 boneyard, if you will, of pipes and -- and floats and
 18 windmill associated equipment, and sucker rods and all
 19 sorts of things at -- at the corral that -- that he
 20 never mentioned. There is no reason for me to believe
 21 that these two troughs that are there weren't there at
 22 the time. How they might have been used is something --
 23 well.
 24 Q. Is it fair to say that they're present today,
 25 they were present when you bought the property and they

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1 connection with ownership of your land, you have made
 2 yourself familiar with a number of relevant documents,
 3 particularly those provided through the NRCS, I think
 4 you expressed that you had made yourself familiar with
 5 those sorts of publications in conjunction with your
 6 land?
 7 A. Yes, with -- with the land and also with our
 8 plans to -- to put cattle on our property.
 9 Q. Okay. I'd like to start going through your
 10 report a little bit. I have some more specific
 11 questions about the report itself.
 12 A. Okay.
 13 Q. If you could turn to page 6. You describe the
 14 infrastructure around your well and I think it goes on
 15 to page 7, I'm getting a little confused. You describe
 16 on the bottom of page 7, and we talked about this
 17 earlier, the tank, the float box, drinkers 1 and 2, and
 18 trough 1 and 2. All of these items were on the property
 19 when you purchased?
 20 A. Yes.
 21 Q. The troughs, where are the troughs and what
 22 are they? I heard Mr. Cox describe drinkers and
 23 describe the water box and the float box and two
 24 drinkers, one on the inside of the corral, and one on
 25 the outside of the corral. Where are the troughs?

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1 were always there?
 2 A. Correct.
 3 Q. Okay. On page 7 of your report you describe a
 4 static water level of 470 feet; is that correct?
 5 A. Correct.
 6 Q. How do you know that? I mean, where do you
 7 get that number?
 8 A. I found that number in the declaration of the
 9 well.
 10 Q. Mr. Cox's declaration?
 11 A. Correct. I think it's in Attachment 2.
 12 Q. Okay.
 13 A. And it says under paragraph 4, "Static water
 14 level 470 feet."
 15 Q. Okay. You read a document a hundred times and
 16 you think you've got it memorized. From that document
 17 it's your belief that it goes down 470 feet. The well
 18 itself has -- so I understand, it's got a windmill tower
 19 and there's a direct vertical line 505 feet down; is
 20 that your understanding of how the well operates?
 21 A. There are multiple pipes going -- going down
 22 the well, starting with the outer casing which extends
 23 only a few feet below the surface.
 24 Q. Do you know how deep the casing is, have you
 25 ever dug the casing out?

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1 Q. In a general sense, that's all I'm asking.
 2 You don't have a citation after this or included in this
 3 paragraph, this is a methodology that you developed in
 4 conjunction with quantifying the water quantity
 5 associated with the water rights in this case; right?

6 A. No. This, in -- in most respects, is how the
 7 hydrographic survey describes how water is consumed.

8 Q. So you're relying on the hydrographic survey
 9 as your methodology for --

10 A. In terms of general approach.

11 Q. Okay.

12 A. You've got cattle, you've got water the cattle
 13 drinks, and you've got losses associated with delivering
 14 that water to cattle. And -- and that's described in
 15 the hydrographic survey.

16 Q. And this approach and each of the components
 17 of this approach is what you were attempting to quantify
 18 in formulating your expert opinion?

19 A. Yes.

20 Q. You go on to state in the next paragraph that,
 21 "The use of a specific water source on open rangeland
 22 will necessarily vary from year to year based upon the
 23 available forage proximate to that water source. To
 24 provide for the amount of water necessary to maintain a
 25 profitable cattle operation over time, appropriated

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1 livestock water rights must reflect the maximum need,
 2 not the minimum or average need, of the cattle."

3 Let me ask you, is it your opinion then that
 4 the quantity of water that should be assigned to a water
 5 right is based on a maximum need of a profitable
 6 operation?

7 A. It is.

8 Q. So that's what you calculated, you're not
 9 saying that that maximum need occurred in any particular
 10 year?

11 A. No.

12 Q. So a maximum need of water is a theoretical
 13 quantity of water that is the basis of your claim for a
 14 water right?

15 A. Could you rephrase that.

16 Q. Sure. This maximum need, which is what you're
 17 trying to quantify, is a theoretical amount of water for
 18 which you believe the water right should be quantified?

19 A. No, it's not a theoretical amount of water,
 20 it's an actual amount of water.

21 Q. Okay.

22 A. Based upon the number of cattle and the
 23 duration of their presence by class of cattle that are
 24 drinking from that water source. So it's something that
 25 could be calculated, it's not theoretical. But it

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1 represents a -- the upper range of water use over a
 2 period of years that when averaged with all other years
 3 can easily calculate an average use.

4 Q. But you're calculating a maximum use to ensure
 5 that all needs, all possible needs will be met?

6 A. If I understand you correctly, yes.

7 Q. I asked earlier, Mr. Fredrickson, the amount
 8 of water that you're quantifying here it's not tied to a
 9 particular year, right? You're not saying that in 1989
 10 that amount of water was used in this way; right?

11 A. No.

12 Q. In any year, are you saying that this amount
 13 of water was used in a particular way?

14 A. I'm saying that based on the deposition of Tom
 15 Cox, who described an operation that involved between
 16 150 and 200 cow-calf pairs or cows, not bulls but cows,
 17 and that population varied from year to year based upon
 18 available forage, that that upper limit of stocking, if
 19 you will, represents the maximum amount of water used in
 20 -- in any year.

21 Q. It was used?

22 A. That was --

23 Q. That amount was used, you're saying that
 24 amount of water was used? I want to be clear about
 25 this.

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1 **A. I am calculating that with a reasonable degree
 2 of certainty that that amount of water was used.**

3 Q. What do you mean by that, reasonable degree of
 4 certainty? How can you have a reasonable degree of
 5 certainty? Are you referring to an uncertainty
 6 calculation or error rate that you're applying?

7 **A. I'm not referring to an error rate, I'm
 8 referring to a -- in a general sense, the -- the
 9 uncertainty that -- that's associated with how much any
 10 cow drinks varies from cow to cow.** The temperature

11 dependence of water intake is also factored into that,
 12 to that characterization, because a temperature varies
 13 from year to year, maximum to minimum. So there are
 14 many factors that go into how much water cows drink.

15 It's not just how many cows or what class of
 16 cow, how much they weigh, what the temperature is when
 17 they drink the water, what their level of physical
 18 activity is, whether they're lactating, what their
 19 reproductive status is, it's a whole host of factors.

20 Q. Let me jump in here just for a second. For
 21 all those host of factors you calculated a maximum need,
 22 right? And that's what we're referring to on page 17,
 23 the maximum need?

24 A. I calculated what I believe to be a
 25 conservative estimate of the maximum need based upon

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1 available data and drinking water rates of cows, and
2 what I know about the -- the nature of the herd, the
3 composition of the herd as a function of time.

4 Q. And it's not that this quantity of water was
5 actually used in any particular year but this would be
6 the maximum need adjusting for all the host of
7 circumstances that you just described; is that correct?

8 A. This will be my estimate of -- my calculation
9 of the maximum need based upon the factors that I took
10 into account.

11 Q. Okay.

12 A. It could be higher and I suspect --

13 Q. And it could be lower?

14 A. No, I don't think it could be lower.

15 Q. Why couldn't it be lower?

16 A. Because by definition a maximum is the highest
17 point that I calculate it to be. A lower amount could
18 be used in some years, I'm not saying that. I'm just
19 saying this to me is a conservative estimate of what the
20 maximum requirement is of that well -- of that water
21 source or use of it, that water source over time.

22 Q. Okay, can we turn to page 18. You detail
23 information that Mr. Cox provided during his deposition
24 and you developed a chart concerning six water sources
25 that he identified there. And I see the Rincon Camp

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1 Well, the Amado Well, the Rincon Hondo Well, the Zuni
2 Spring, the High Lonesome Well, and the Perry Canyon
3 Well.

4 At page 21 of your report you call the Amado
5 Well, the Zuni Spring and Perry Canyon not significant
6 or not credible water sources. Is that what you believe
7 Mr. Cox described or is that your expert opinion
8 associated with the circumstances of this subfile
9 action?

10 A. That is my expert opinion based upon my
11 evaluation of this topic.

12 Q. Mr. Cox didn't call these water sources, the
13 Amado Well, the Zuni Springs or the Perry Canyon,
14 significant or credible water sources, that's what
15 you're calling them?

16 A. That's what I'm calling them based upon my
17 discussion of each.

18 Q. And is this consistent with what Mr. Cox
19 described? Do you believe that what you're describing
20 is consistent with what Mr. Cox was describing in his
21 testimony?

22 A. I think those -- those two are compatible.

23 Q. How so?

24 A. How so?

25 Q. How so?

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1 A. A water source does not have to be significant
2 to be considered a water source. But in terms of
3 quantifying water sources under the criteria developed
4 by the NRCS, in the case of the Amado Well and the Perry
5 Canyon Well, without any storage capability say the
6 drinker itself, they're classified as undependable
7 source.

8 Q. Okay.

9 A. And they certainly don't have the ability to
10 store very much water. In the case of Zuni Spring and
11 from reviewing the -- the docket on the -- in this
12 adjudication, such springs when they're not developed
13 and provided with troughs are not assigned a water
14 right.

15 Q. So do you agree with me though that Mr. Cox
16 did describe these three sources, the Amado Well, the
17 Perry Well and the Zuni Springs, he described them as a
18 water source for his herd; right?

19 A. He did.

20 Q. And your description of the undependable water
21 supply in classifying these water sources as an
22 undependable water supply, and I'm just going to jump
23 back a little bit, does this fit in with what you were
24 describing on page 16 and 17 of your report about
25 figuring out what the maximum need is for your water

87

1 source, the Rincon Hondo well, right? So in analyzing
2 the region you sort of took out of play, the Perry Well,
3 Zuni Springs, the Amado Well; is that fair to say?

4 A. I did not consider them to be competing
5 sources for the other three water sources.

6 Q. You did not consider the Rincon Hondo Well to
7 be competing sources to the other three water sources;
8 is that right?

9 A. No, I did not consider the Amado Well, the
10 Perry Canyon Well or Zuni Springs to compete in any
11 significant way with water withdrawn from the Rincon
12 Camp Well, the High Lonesome Well, or the Rincon Hondo
13 Well.

14 Q. Even though you do recognize Mr. Cox describes
15 relying upon those water sources?

16 A. I heard -- I heard him say that.

17 Q. Is there a reason for you to not believe him?
18 I mean, you have some hesitancy here, Mr. Fredrickson,
19 I'm trying to figure out what it is.

20 A. I'm -- I'm not hesitating, I'm just saying
21 they're not significant sources of water. As I provide,
22 for example, a comparison of the water from Amado to the
23 Rincon Hondo, I cite that -- that apparently no water
24 right was assigned to Zuni Springs. And then I also
25 discuss the fact that the Perry Canyon Well where I

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1 believe water contaminated the gypsum and was apparently
2 used by another neighbor in that area who is -- we are,
3 you know, without knowledge of.

4 Q. And on pages 21 and 22, a different point, and
5 I think you've already mentioned this, you describe the
6 three water sources; the Amado Well, the Perry Well, and
7 the Zuni Springs. You describe them at different points
8 as not credible, incidental at best, or that they can be
9 ignored. What's your basis for saying that? Is it in
10 the definition that NRCS provides or is it conditions
11 today? Tell me why is it.

12 A. Well, it's -- it's based on the factors I just
13 mentioned as well as their distance from the Rincon
14 Hondo Well. Cattle that graze at the Rincon Hondo Well
15 and pasture approximate to it are not going to be
16 drinking water from the Perry Canyon Well, which is some
17 eight miles or more from the Rincon Hondo Well. And the
18 distance to Zuni Spring is also beyond a grazable
19 distance from the Rincon Hondo Well.

20 So those factors and the storage factors and
21 the -- the condition of those water sources, and the
22 fact that -- that, you know, at least one is
23 contaminated with gypsum and used by a neighbor, and the
24 fact that Zuni Springs is not assigned a water right,
25 all of these things lead me to that conclusion.

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1 Q. Okay, let me ask you this, how would your
2 opinion change if one of these or all of these were
3 actually credible water sources that met the NRCS
4 definition that you identify? What would happen to your
5 analysis, how would your analysis change? So let's say
6 Perry Well is a credible water source, we've got
7 storage, they're inspected frequently, they are sources
8 which they've got power supply and they've got a minimum
9 three-day source. Let's just say hypothetically they
10 meet the definition or pass the definition that are no
11 longer considered undependable water supply, how would
12 that affect your analysis?

13 A. You're asking me to answer a question -- a
14 hypothetical question --

15 Q. I am.

16 A. -- that changes --

17 Q. Yes.

18 A. -- the conditions --

19 Q. You're an expert, are you not?

20 A. -- that changes the conditions under which my
21 analysis was conducted?

22 Q. Yes.

23 A. So, for example, it might or might not change
24 my results.

25 Q. Let me change the conditions of your analysis

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1 by one factor, that Zuni Springs is a credible water
2 source, credible, dependable water source. How would
3 that change your analysis of the water quantity
4 associated with the Rincon Hondo Well?

5 A. It would not.

6 Q. At all?

7 A. At all.

8 Q. How about the Perry Well?

9 A. The Perry Canyon Well?

10 Q. The Perry Canyon Well, if that were changed
11 and it were a credible water source, how would that
12 change your analysis, that single change to that
13 previous circumstance, would it change your analysis
14 about the water --

15 A. It would not.

16 Q. -- quantity associated with the Rincon Hondo
17 Well?

18 A. It would not.

19 Q. Is that because in your calculation you were
20 calculating the maximum need associated with the Rincon
21 Hondo Well to ensure a profitable cattle operation?

22 A. You're going to have to rephrase that
23 question.

24 MR. GUARINO: Could you restate the question,
25 read back the question.

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1 (The record was read back.)

2 A. If I understand correctly, no.

3 Q. (By Mr. Guarino) So if it matters not that
4 they are credible sources or not credible water sources,
5 why is it included in your report? You included a
6 section in your report concerning undependable water
7 supply. Correct me if I'm wrong, you identify the Perry
8 Canyon Well, the Amado Windmill Well, and Zuni Springs
9 as not credible water supply sources; is that correct?

10 A. Correct.

11 Q. I've asked you to assume that the Perry Canyon
12 Well, assume that it was a credible water supply, how
13 would that affect your calculation associated with water
14 quantity tied to the Rincon Hondo Well? You said it
15 wouldn't.

16 A. That's correct, it wouldn't.

17 Q. I'm just kind of moving through, Mr.

18 Fredrickson, I'm not trying to talk over you at all,
19 please understand that. I asked you about Zuni Springs
20 and I asked you to assume that it was a credible water
21 source, and I asked you to assume that and tell me how
22 that would change your analysis of the Rincon Hondo Well
23 water quantity calculation, and you indicated it
24 wouldn't.

25 A. Correct.

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1 Q. My question to you now is, how is this opinion
 2 or this information helpful to your expert opinion?
 3 A. To the opinion itself it goes to the scope of
 4 cattle cow-calf operations that Tom Cox described, the
 5 Rincon Hondo Canyon regional herd and their winter
 6 season locations versus summer season locations, and the
 7 water sources they were using, and how that herd was
 8 divided up as a function of -- of seasons and well
 9 locations. So it provides a completeness of discussion
 10 of the operation that was going on, on the ranch, of
 11 which the Rincon Hondo Well was a part.

12 Q. And it's your expert opinion that the herd
 13 that Mr. Cox managed had no significant reliance on the
 14 Zuni Springs, the Perry Canyon Well, no significant
 15 reliance, let me put it that way?

16 A. No, I did not conclude that.

17 Q. What reliance did the herd have on those
 18 wells, in your opinion?

19 A. In years of unfavorable forage growth, where
 20 the forage associated with the Rincon Hondo Well was
 21 depleted, cattle could range, if the forage was
 22 incomplete or insufficient to pasture, beyond the Rincon
 23 Hondo Well in the summer season where they could find
 24 additional forage and water.

25 Q. Are you expressing an opinion as to how the

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1 herds actually operated at any time in the past based
 2 upon what you describe as favorable or unfavorable range
 3 conditions?

4 A. In part.

5 Q. And am I correct that the basis for how you
 6 predict the cow herd actually operated is based upon
 7 your review of publications?

8 A. Yes.

9 Q. Anything else?

10 A. It's also based on the deposition of Tom Cox.

11 Q. At page 23 you state, "Given the above, it is
 12 reasonable to conclude that, starting in July, the
 13 regional herd would initially water at and feed on
 14 pasture grass surrounding the Rincon Hondo Well." This
 15 is what you were just describing then?

16 A. Yes.

17 Q. Favorable conditions, they stay at the Rincon
 18 Hondo Well, they don't go anywhere outside the two-mile
 19 radius?

20 A. Correct.

21 Q. And your basis of saying this is your review
 22 of publications?

23 A. I -- I'm saying this on the basis that -- that
 24 they would start there and they would initially water
 25 and feed on -- on that grass.

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1 Q. Take a look at the quotation that you provide
 2 right above there starting with, "Livestock,
 3 particularly cattle, are predictable in their grazing
 4 behavior. One of their most conspicuous habits is to
 5 graze convenient areas. These are generally areas close
 6 to water or those that are easily accessible, such as
 7 level terrain within an area of rough topography. Given
 8 the choice and/or lack of sufficient enticement, cattle
 9 will abuse these convenience areas." And you cite
 10 "(Volesky, 1996)."

11 A. Yes.

12 Q. So your reliance on the statement given above
 13 is on these publications, you don't cite to Mr. Cox's
 14 deposition up above?

15 A. Not in this particular area, no.

16 Q. And for this proposition that cows are not
 17 going to go in favorable conditions, cows are not going
 18 to go beyond the convenient water source?

19 A. They will not need to go beyond a convenient
 20 water source unless they are driven to -- to do so or
 21 enticed to do so.

22 Q. Right. And you're relying on this quote from
 23 the Volesky publication?

24 A. Well, the -- the publication itself, I just
 25 took this -- this particular quote kind of

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1 encapsulates --

2 Q. What he's saying.

3 A. -- what he's saying.

4 Q. Mr. Cox didn't say anything like this, did he?

5 A. He said that cattle would -- would go where
 6 water and forage was available.

7 Q. Mr. Fredrickson, take a look at Image 1 there
 8 on the same page.

9 A. Yes.

10 Q. Can you tell me what that is and where it came
 11 from?

12 A. This is a Google Earth Image. It
 13 represents -- there are two lines drawn on it. The
 14 yellow line is the straight line distance between the
 15 Rincon Hondo Well and the High -- and the High Lonesome
 16 Well locations using the Google Earth line and path
 17 distance tool. The white image is a path by which
 18 cattle can reach that well location without encountering
 19 impassable terrain and which is based on my ground truth
 20 of -- of that path.

21 Q. So this is the path that you predict a cow
 22 will take if it were to go and try and get to the High
 23 Lonesome Well?

24 A. Yes.

25 Q. Mr. Fredrickson, do you hold yourself out as

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1 Q. I'm going to switch gears a little bit.
 2 A. Okay.
 3 Q. I want to talk about the losses that you
 4 identify in your report and the calculations that you
 5 provide associated with losses of water and associated
 6 with herd operation, okay?
 7 A. Yes.
 8 Q. I think it begins on page 54 at the very
 9 bottom and then goes into 55. Now you talk about a
 10 loss, the first loss you talk about is water lost when
 11 an animal is drinking. And you say, I believe, at the
 12 bottom of 55, top of 56, that "it is calculated that
 13 40,790 gallons of water were lost per year in
 14 association with cattle drinking at well 10A-5-W06."
 15 And I want to make sure that this is not a subject of
 16 one of your erratas.
 17 A. It's not.
 18 Q. Okay. If we do run across one of those would
 19 you please let me know?
 20 A. I will.
 21 Q. So, as I understand it, this is for water
 22 falling from a cow's mouth while the cow is drinking?
 23 A. Basically I was trying to capture that and
 24 other water losses associated with the drinking process.
 25 Q. What other losses? I mean, besides that, what

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1 other losses?
 2 A. Cattle getting into the drinker.
 3 Q. Okay, I see a picture in Figure 21 of a cow in
 4 the drinker I guess splashing around. So you're trying
 5 to calculate an amount of water that might be associated
 6 with the cow getting out and spilling water outside the
 7 trough?
 8 A. In general, I'm trying to capture all the
 9 water losses associated with the drinking process.
 10 Q. But this analysis, for this loss, you came up
 11 with a simple percentage of the total amount consumed?
 12 A. Correct.
 13 Q. Is this based on any study that you've come
 14 across?
 15 A. I've -- no, I can't find any study that
 16 addresses this topic.
 17 Q. Are those water losses included with
 18 Winchester and Morris, to your knowledge?
 19 A. No.
 20 Q. If it turns out that Winchester and Morris
 21 actually do include a loss such as this sort, the
 22 spillage, would your additional calculation of spillage
 23 for this very same reason be a double count of maybe a
 24 water consumption or a water loss in your water
 25 consumption calculation?

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1 A. If it were included in Winchester and Morris
 2 would I be double counting?
 3 Q. Yes.
 4 A. I would.
 5 Q. Okay. Did you take any steps to test this
 6 analysis, this percentage analysis based on all
 7 consumption measurements, metering, setup any test study
 8 or anything like that or is this just, "I'm going to
 9 pull a stray consumption percentage?"
 10 A. I discuss how I arrived at the number, through
 11 visual observation of cows drinking and my actual video
 12 of other ungulates drinking and concluded that they
 13 drink pretty efficiently.
 14 Q. Right, with some loss?
 15 A. With some loss occurring. And of that size I
 16 assumed -- it looks to me about 90 percent of that water
 17 goes down the hatch, they spill water, some of that
 18 water is spilled back into the drinker, that's not a
 19 loss in terms of -- of water. Some portion of that is
 20 spilled to the ground. And on that basis as I -- as I
 21 indicate, on that basis I calculate 40,790 gallons over
 22 the course of a year gets spilled to the ground as a
 23 consequence of drinking.
 24 Q. On page 56 you calculate a -- I think this
 25 might be one of your erratas, 59,054 gallon loss because

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1 of cleaning practices?
 2 A. No, that's not an errata.
 3 Q. Okay. So on page 56 you describe a 59,054
 4 gallon loss for cleaning practices. Why did you
 5 calculate this loss?
 6 A. Because it is necessary to refresh the water
 7 in the drinker that cattle use.
 8 Q. Is this a practice that Tom Cox described in
 9 his testimony?
 10 A. He didn't speak to this.
 11 Q. He didn't speak to this at all?
 12 A. No.
 13 Q. If he said that he didn't clean his drinkers
 14 and tanks and such on the rate and the way that you're
 15 describing here, would it be appropriate to include this
 16 cleaning loss as a part of your water consumption
 17 calculation?
 18 A. If he said that, it -- it would not be
 19 appropriate. However, he only spoke to the cleaning of
 20 the tanks, he didn't talk about the cleaning of the
 21 water.
 22 Q. Can you describe for me the practice of
 23 cleaning of the water, what is that as opposed to
 24 cleaning of the tanks?
 25 A. Cleaning of the tanks would involve scrubbing

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1 A. By something he didn't say.
 2 Q. Let's talk about the weep hole a little bit.
 3 You calculate a loss of 197,103 gallons because of the
 4 weep hole; is that correct?
 5 A. That's correct.
 6 Q. And that's on page 58.
 7 A. Okay.
 8 Q. You know, we talked a little bit about the
 9 weep hole in your report, can you tell me about this.
 10 Let's start off on the same page. Where is the weep
 11 hole?
 12 A. The weep hole is in the standpipe
 13 approximately four feet underground.
 14 Q. I'm going to hand you --
 15 A. Or the drop pipe, I'm sorry, the drop pipe.
 16 (Exhibit F was marked for identification.)
 17 Q. (By Mr. Guarino) I'm going to hand you an
 18 Exhibit that's going to be marked as Exhibit F. This is
 19 a picture from your report, right? It's a picture, I
 20 think, of you standing behind the drinker in front of
 21 the storage tank by the windmill. Is that you?
 22 A. It is.
 23 Q. All right. And that's our windmill?
 24 A. That's my windmill.
 25 Q. Touché. The standpipe, do you see the

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1 standpipe there?
 2 A. I do.
 3 Q. Okay, where is it?
 4 A. It's this portion of pipe above ground.
 5 Q. It's a vertical pipe directly, it looks like,
 6 in the center of the windmill tower?
 7 A. Correct.
 8 Q. And that standpipe goes into the ground how
 9 deep?
 10 A. The standpipe?
 11 Q. Yes.
 12 A. Approximately 505 feet.
 13 Q. And the weep hole is located in that standpipe
 14 about four feet below; right?
 15 A. Well, technically the portion of that pipe
 16 below ground is called the drop pipe.
 17 Q. Okay.
 18 A. And it's in the drop pipe approximately four
 19 feet below ground.
 20 Q. You've never seen this weep hole? Have you
 21 ever dug it out?
 22 A. You can't access it without pulling them, the
 23 drop pipe.
 24 Q. And you've never done that?
 25 A. No.

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1 Q. How do you know a weep hole is down there?
 2 A. Because Tim Cox told me it was.
 3 Q. Can you tell me when water flows out of that
 4 weep hole?
 5 A. Any time the water level and the standpipe or
 6 drop pipe is above, the weep hole water is -- some water
 7 is flowing out.
 8 Q. And if I'm correct, in your report you
 9 calculate that that is flowing 59.3 percent of the time
 10 over an 11-month period; is that correct?
 11 A. No. The -- that percentage of time is the
 12 time it would -- through which the windmill is -- the
 13 wind is blowing in sufficient speed to actually pump
 14 water.
 15 Q. Okay.
 16 A. But cycling of the windmill back and forth
 17 before it starts to spin in 360 degrees also results in
 18 a loss of water through that weep hole. It simply -- at
 19 those lower speeds water is not being produced at a rate
 20 that would allow it to reach the top of the standpipe
 21 and flow into the storage tank.
 22 Q. Okay.
 23 A. The percentage that you mentioned, 59.3
 24 percent, is the percentage of time wind speed is
 25 sufficient to be pumping water into the storage tank.

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1 And at that -- and during those times the -- the head
 2 produced by that column of water above the weep hole is
 3 sufficient to allow water to spill out the weep hole at
 4 a calculated 0.69 gallons percent minute.
 5 Q. And to get to the 197,103 gallon loss you
 6 apply this 59.3 percent period of pumping to the rate of
 7 water flow that you calculate?
 8 A. Correct.
 9 Q. So that 59.3 percent figure is the amount of
 10 time you used in your calculation as your estimate of
 11 how often the weep hole is flowing with water at a rate
 12 of 0.69 gallons per minute?
 13 A. No. 59.3 percent is the frequency of time at
 14 which water flows through the weep hole at 0.69 gallons
 15 per minute. The time is based upon an 11-month period.
 16 So that 11-month period, because I've assumed that the
 17 windmill is shut down, only bulls were -- were there and
 18 so time is calculated at 59.3 percent.
 19 Q. Thank you that clarification. Where did
 20 the water that go when it flows out of the weep hole?
 21 A. It goes into the annular section between the
 22 casing or borehole and the -- and the outside of the
 23 drop pipe.
 24 Q. You estimate flow here through your
 25 calculations, have you made any attempts to meter the

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1 flow of 0.69 gallons per minute at any time over the
2 last 10 years? Is there any way to do that that you
3 know of?

4 A. By metering you mean measuring?

5 Q. Yes.

6 A. No. But I am frequently pumping water for
7 domestic use at the -- at the windmill. And my
8 observation of the -- the weep rate is that it drops
9 approximately 10 feet over an approximate five-minute
10 period.

11 Q. What are you observing, what is it you're
12 looking at?

13 A. I'm looking at the rate of water drop between
14 the top of the standpipe and my hose bib at the bottom.

15 Q. On the picture what are you looking at, can
16 you show me?

17 A. Well, it's not shown here because at the time
18 this picture was taken I was drawing my water from this
19 point up here.

20 Q. Okay.

21 A. Now I draw my water from --

22 Q. The bottom of the tower?

23 A. -- the bottom of the tower.

24 Q. And you are seeing the water move down the
25 hole or what are you observing? I just don't

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1 understand, I don't know what that is.

2 A. Okay. When the wind is blowing at sufficient
3 wind speed, water is lifted up the standpipe and
4 discharges into the tank. However, when I'm -- when I'm
5 collecting water for domestic use, I collect it from a
6 point down here.

7 Q. On the standpipe.

8 A. On the -- on the standpipe near ground level,
9 approximately 10 feet below the top.

10 Q. Okay.

11 A. When I -- when I finish filling a -- a --
12 water container, I shut this off and replace the water
13 container. In the meantime, the water level I might be
14 pumping it here, it might be rising up here but as soon
15 as the wind stops this water level will slowly drop to
16 the point where if I open this valve there's no more
17 water in this -- in this pipe.

18 Therefore, I'm able to see that the water
19 level drops from the top of the standpipe to this point
20 near the ground over a five-minute period through the
21 weep hole. And from that, I can judge the -- the
22 approximate diameter of that weep hole.

23 Q. Have you ever taken any measurements with
24 respect to that drop of water?

25 A. No.

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1 Q. Is it possible that that drop of water is
2 caused by you filling up your water jugs?

3 A. No.

4 Q. Why? How come?

5 A. Because -- because this -- this valve is
6 closed during that drop.

7 Q. So it was working when you had it open to your
8 jugs and then you closed it and opened it again. You've
9 observed or just generally noted that the windmill had
10 stopped pumping and there's no water left in that --

11 A. Correct, I closed this pumping and -- this
12 tank -- this -- this standpipe is full, but in five
13 minutes the water level is below my hose bib location.

14 Q. And these are just anecdotal experiences that
15 you've had over the course of 10 years?

16 A. Yeah, hundreds of times I've seen this.

17 Q. Okay. Let's talk about leaks. You start at
18 page 60 regarding leaks. You calculate a 52,560 gallon
19 loss from leaks; right? It's actually on page 61. You
20 begin discussing about leaks on page 60, you go to page
21 61 with the conclusion about the 52,560 gallon loss.

22 A. Uh-huh.

23 Q. And you estimate that it's a loss of 0.1
24 gallons per minute loss. Is that a loss that's going on
25 today?

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1 A. Yes.

2 Q. And why is it that you believe that it's a
3 loss that existed previously?

4 A. Because there are signs of efforts to mitigate
5 losses associated with the water distribution system.
6 For example, in the one trough I removed -- I picture
7 here seven different repairs on that one tank alone.

8 Q. On Figure 24?

9 A. Correct. I ultimately remove that because
10 there was no way for me to mitigate that loss and I was
11 simply wasting water.

12 Q. So the 0.1 loss that's going today is
13 associated with these losses in Figure 24 or where is
14 the water going?

15 A. It's going through various holes or -- or
16 cracks within the water distribution system. I can't
17 really tell exactly how many holes or cracks there are.
18 All I can do is observe the water level drop in the main
19 holding tank over a week period, it's about a foot. And
20 when I calculate that, it turns out to be about 0.15
21 gallons per minute of water loss.

22 I assumed here that the leakage rate is at
23 least 0.1 gallons per minute because some of that water
24 is being lost due to evaporation and some of that water
25 is being lost due to the consequence of -- of animals

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1 drinking. But, obviously, there are many places
2 throughout a system like this where water can be lost,
3 and trying to mitigate all of those is simply
4 impossible.

5 Q. Have you taken any measurements with respect
6 to measuring this loss?

7 A. Only that I've noted about approximately one
8 foot drop per week.

9 Q. Is this a rough estimate? Did you take a
10 ruler and measure the drop over time or keep a log of
11 any measurements or do anything like that to actually
12 pinpoint exactly what's going on at your storage tank?

13 A. I noted the level drop by looking at the --
14 the bolts in seams on the main holding tank. As I
15 indicated, we used that tank for recreational purposes
16 so we have a ladder leading up to that tank. And when I
17 turn off the windmill and -- which I always do when I
18 leave because I don't want overflowing, I come back and
19 the water level is down a week -- down about a foot in a
20 week. So this is indicative of the water loss through
21 the entire system.

22 Q. So it's a reflection of a water loss from
23 evaporation; right?

24 A. Yeah.

25 Q. Drinking by wildlife?

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1 A. Correct.

2 Q. And other?

3 A. And leakage through various cracks and holes
4 in the -- in the system piping components.

5 Q. And you're basing this amount of loss on your
6 observations of a drop in the water level over a week
7 period of time in your storage tank?

8 A. Main storage tank, correct.

9 Q. Okay. How did you subtract the evaporation
10 and wildlife usage from your calculation as associated
11 with this loss to arrive at 0.1 gallon per minute rate
12 of loss?

13 A. Evaporation accounts for approximately a four
14 foot loss per year, four feet divided by 52 is less than
15 an inch. So about an inch of that 12 inches of loss is
16 associated with evaporation. Wildlife consumption I
17 calculated to be, I think total, approximately 39,694
18 gallons per year over a period of 52 weeks, that's
19 approximately -- approximately 20 feet of water loss.
20 And when I consider those two water losses I don't see
21 any other water losses to account for in this situation.
22 I simply reduced the leakage rate from what I estimate
23 to be 0.15 to 0.1.

24 Q. Okay.

25 A. And this -- I also noted that this is typical

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1 of losses associated in the industry with -- in such
2 systems.

3 Q. How do you say that, is that based upon your
4 review of the publications that you've been examining or
5 is this --

6 A. Yes.

7 Q. -- some other experience?

8 A. Yes. I compare this loss to the report I
9 cite, seven -- seven percent loss rate is due to
10 fittings alone. And that would have resulted in a
11 57,106 gallon loss annually. And my loss was in the
12 same range, 52,000 gallons.

13 Q. Okay.

14 A. So it seems to be comparable.

15 Q. Okay. Let's talk about ice, you talk about
16 ice and I think you're talking about ice because Mr. Cox
17 talks about ice. At page 61 you start discussing --
18 wait, page 62 it looks like, yes, ice. So you
19 calculated a 6,917 gallon loss for ice and this is based
20 upon what you believe Mr. Cox described?

21 A. Yes.

22 Q. And do I understand that you estimate four
23 inches of ice removed every other day from December 1st
24 to March 1st?

25 A. Four inches of ice and water.

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1 Q. Ice and water?

2 A. Correct.

3 Q. Why would water be removed?

4 A. Well, this is one of the practices I use to
5 remove ice, chop it up and push the pieces of ice out of
6 the tank. In doing so you lose a lot of water as well
7 as the ice.

8 Q. And you estimate four inches of ice and water
9 removed?

10 A. Yes.

11 Q. How do you distinguish between ice and water
12 in your calculation? Do you assume it's all ice, do you
13 assume it's all water? I mean, different substances of
14 water, whether it's ice or water, have different amounts
15 of water in it.

16 A. I'm making a -- an estimate of the combined
17 water and ice on the average that's lost over that
18 period of time.

19 Q. So in your calculation to calculate the amount
20 of water here, did you use four inches of ice or four
21 inches of water?

22 A. Neither, combined, four inches of
23 volumetric -- volumetrically four inches of -- of ice
24 and water is removed in that process. It's a volumetric
25 calculation that includes both water and ice.

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