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1 MR. UTZ: Case 4710.

2 MR. HATCH: Application of the Hanson Oil Company
3 for an exception to Order No. R-3221, as amended in Eddy
4 County, New Mexico.

5 MR. UTZ: Appearances?

6 MR. KELLAHIN: Jason Kellahin and W. Thomas
7 Kellahin of Kellahin and Fox, Santa Fe, appearing on behalf
8 of the Applicant.

9 MR. NEAL: C. Fincher Neal, of Hobbs, New Mexico,
10 and we appear on behalf of Snyder Ranch Limited.

11 JERALD R. HARRINGTON,

12 was called as a witness, and after being duly sworn, testified
13 as follows:

14 DIRECT EXAMINATION

15 BY MR. KELLAHIN:

16 Q Would you state your name, please?

17 A Jerald R. Harrington.

18 Q By whom are you employed, and in what position?

19 A I am employed by the Hanson Oil Corporation, of Roswell,
20 New Mexico, as a Petroleum Geologist.

21 Q Have you testified before the Oil Conservation
22 Commission or before one of its Commissioners and made
23 your qualifications as a Geologist a matter of record?

24 A I have.

25 MR. KELLAHIN: Are the witness' qualifications

1 accepted?

2 MR. UTZ: Yes, they are.

3 Q (By Mr. Kellahin) Mr. Harrington, are you familiar
4 with the Application before the Commission, the
5 Application of the Hanson Oil Corporation?

6 A I am.

7 Q What is proposed by the Applicant in this Case?

8 A Hanson Oil Corporation proposes to deposit a certain
9 volume of produced water in unlined surface pits.

10 Q Referring to what has been marked Applicant's Exhibit
11 Number 1, would you identify that Exhibit?

12 A Exhibit 1 is a land map.

13 Q Exhibit 1 is an enlargement of the conventional land
14 map of the area, the subject area of this Application?

15 A Yes. The leases operated by the Hanson Oil Corporation
16 are colored in yellow.

17 The areas investigated by me personally for the
18 presence of either water wells or water tanks, are
19 outlined in red.

20 The areas outlined in green represent areas covered
21 by exceptions to Order R-3221.

22 Q Those exceptions were granted by the Commission in
23 previous cases?

24 A Correct.

25 Q Do you show the Case and Order Number in each instance?

1 A They are shown on the map.

2 Q What other information is shown on the Exhibit?

3 A The small squares outlined in red indicate the
4 proposed unlined surface pits, which will be utilized
5 for the disposal of produced salt water.

6 The triangle outlined in blue indicate either
7 water supply wells, or water tanks.

8 Q Now, you show two such areas outlined in blue, within
9 the area you investigated, would you describe what
10 those two sources of water are?

11 A In the location, the northeast quarter of the northwest
12 quarter of Section 22, that is a stock tank which, to
13 my understanding is being supplied by the water supply
14 running from the east to the Duval Corporation potash
15 mine operations located in Section 27.

16 Along the line there have been placed several tanks
17 which are utilized for stock watering purposes.

18 Q There is not a surface or underground water supply
19 at that location?

20 A Not to my knowledge.

21 Q It is from the pipeline, as far as you know?

22 A Correct.

23 Q How about the one in Section 26?

24 A Located in the northwest quarter of the southeast
25 quarter of Section 26, is a water supply well which is

1 utilized for, according to our field foreman's
2 conversation with the ranch foreman, utilized for
3 stock watering purposes.

4 Q What is the source of the water in that well?

5 A A report from the Bureau of Land Management, the
6 depth of the water supply is 230 feet below the
7 surface.

8 Q Now, you show on your Application, and our Application
9 covers the area of the north half of the southwest
10 quarter of Section 26, do you need that surface disposal
11 pit in that location?

12 A We would like to delete that from our Application, at
13 this time.

14 Q Describe it again, please?

15 A The north half of the southwest quarter of Section 26,
16 there is a red square on the yellow acreage. We had,
17 in our Application, applied for utilization of this
18 unlined disposal pit, however, we subsequently drilled
19 and plugged and abandoned the location indicated as
20 the location 2,310 feet from the south and 2,310 feet
21 from the west.

22 That well has been abandoned and we do not have
23 any need for utilization of the unlined pit at that
24 location.

25 Q Referring to the various surface pits by location, could

1 you give us the volume of water and the source of
2 water that will be disbursed in these particular pits?

3 A Starting with Section 24 in the northwest quarter of
4 the southeast quarter immediately south of Well Number
5 Five, we propose utilizing the unlined surface pit at
6 that location for an amount of produced water of
7 approximately seventeen barrels of water per day.

8 At the location in the southwest quarter of the
9 southeast quarter of Section 25, the location of the
10 unlined surface pit there, we request authority to
11 utilize that pit for the disposal of approximately --
12 if I may delay a moment here, to dig out my notes. One-
13 half a barrel of water per day.

14 At the location lying in the northeast quarter of
15 the southeast quarter of Section 26, for Wells 8910 and
16 8911, we propose utilizing an unlined surface pit for
17 the disposal of approximately seventy barrels of water
18 per day.

19 At the location in the northwest quarter of the
20 southeast quarter of Section 26, we propose utilizing
21 the unlined surface pit for the disposal of approximately
22 forty barrels of produced water per day.

23 Immediately south of that, we propose utilizing
24 that location for an unlined surface pit for the disposal
25 of approximately one and one-half barrels of produced

1 water per day.

2 MR. PORTER: Is this still in Section 26?

3 THE WITNESS: That is correct.

4 MR. NEAL: Is that the northernmost well?

5 THE WITNESS: No, the southernmost well.

6 A (Continuing) The remaining three proposed unlined
7 surface pits lie in acreage still undrilled by the
8 Hanson Oil Corporation, so we have no determination
9 as to the amount of water.

10 Q Referring to what has been marked as Applicant's Exhibit
11 Number 2, would you identify that Exhibit, please?

12 A Exhibit Number 2 is a portion of a topographic map
13 and the color scheme which has been maintained indicates
14 the topography of the area in which we would hope --
15 that we would request the utilization of unlined
16 surface pits for disposal.

17 Q What is the general direction of the drainage in the
18 area?

19 A The general surface drainage is to the south and
20 southwest.

21 Q Referring to Exhibit Number 3 would you identify that
22 Exhibit, please?

23 A Exhibit 3 is a copy of a portion of the Number Three
24 Ground Water Report, from the New Mexico Bureau of Mines
25 entitled, "The Direction of Ground Water Movement."

1 Q Does it likewise indicate a south or southwest
2 movement of water in the area?

3 A It does.

4 Q Now, generally, Mr. Harrington, what is the nature
5 of the surface and the sub-soil in this particular
6 area?

7 A The surface is primarily covered with blown sand
8 deposits.

9 Q And, is there any intervening shales or anything above
10 any of the water zones in this area?

11 A I would refer you back to Exhibit 1. In Section 24, Well
12 Number Five, that well was drilled with cable tools and
13 we have, I have examined the samples from the surface
14 to the total depth of that well, the correlative
15 interval from the surface to the correlative zone, and
16 those rocks are comprised chiefly of red anhydritic shales,
17 red and gray anhydritic sandstones, and some beds of
18 pure anhydrite.

19 Q In your opinion, would the disposal of water at the
20 surface have any vertical communication with the fresh
21 water zone?

22 A In my opinion, I do not feel there could be vertical
23 communication downward of the waters from the surface.

24 Q Just to repeat, what support those zones, the surface
25 from the water zone?

- 1 A The lithology separation is comprised of shales,
2 anhydritic shales, anhydritic sandstones, and
3 anhydrite.
- 4 Q Referring you to what has been marked Applicant's
5 Exhibit 5, would you identify that and discuss that,
6 please?
- 7 A Exhibit 5 is a copy of a portion of the log of the
8 Hanson Oil Corporations's Number 1 Lewis B. Benson
9 Well.
- 10 Q Where is that well located in relation to the Snyder
11 well?
- 12 A The well is located to the north of the water well, the
13 Snyder Ranch Water Well.
- 14 Q I'm sorry, the Snyder Ranch. How far north?
- 15 A Approximately 800 feet north of the water well.
- 16 Q So, the formation there should be representative of
17 the area of where the water well is located?
- 18 A This is correct. -- I would like to rectify an error
19 on the 800 feet, it is 550 to 560 feet north of the
20 water well.
- 21 Q Would you discuss the information shown on Exhibit 5?
22 How would you interpret this log in regard to the
23 problem we have here?
- 24 A The interval of the log colored in blue is correlative
25 to the interval which has been reported as the water

1 bearing horizon in the water well at the Ranch.
 2 The gamma ray indicates the approximate lithology
 3 encountered in the interval between the surface of
 4 the ground and the reported water zone.

5 It has been interpreted based on the correlation
 6 between the log of this well and the log of the Number
 7 Five Well, as well as samples run in the Number Five Well
 8 that the lithology is comprised of anhydritic red shales,
 9 anhydritic sandstones, and anhydrite.

10 Q Did you contact the State Engineer's Office of the
 11 State of New Mexico, to inquire as to the fresh water
 12 supply in the area?

13 A I did.

14 Q Did you get a letter from the State Engineer?

15 A I did.

16 Q Referring to what has been marked Applicant's Exhibit
 17 6, is that the letter which you received?

18 A That is correct.

19 Q And, in summary, does that show there is fresh water
 20 in the area?

21 A Yes.

22 Q And it agrees that the surface drainage is generally
 23 toward the south and west?

24 A That is what is stated by the letter from the State
 25 Engineer's Office.

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1 Q Did you have a water analysis made from the water
2 from the Snyder Ranch Water Well?

3 A Yes.

4 Q Is that Exhibit Number 7?

5 A Correct.

6 Q And, did you make a representative analysis of the
7 water you will dispose of on the surface?

8 A Correct.

9 Q And is that Exhibit 8?

10 A Yes, sir.

11 Q Now, Mr. Harrington, in connection with your problem
12 of disposing water on the surface in the area, what
13 would be the situation as to surface migration of water
14 to the Snyder Water Well?

15 A In all probability, there would be little or no
16 migration of any of the water disposed of in the
17 proposed locations. The amount of water being
18 produced in the Number 1 Benson Well is of such a small
19 quantity and there is approximately forty-five feet of
20 blown sand between the surface location of the water
21 well and the Ranch Headquarters?

22 Q That is the pit which will dispose a barrel and one-half
23 a day?

24 A Correct.

25 Q And that is produced from one oil well?

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1 A That is correct.

2 Q Would you continue?

3 A With forty-five feet of sand on the surface, at that
4 location, it is highly improbable there would be any
5 vertical migration below the caliche. Even if there
6 should be any migration at all, water passing through
7 thirty to forty feet of sand would be of improved
8 quality by the time it reaches the surface location --
9 at the same surface location as the water well is
10 located.

11 Q In your opinion, would it reach the surface location?

12 A No, it would not, in my opinion.

13 Q Going to the surface pit to the north of the one you
14 just discussed, what is the situation as to it?

15 A The situation would be quite similar except for the
16 fact it is located on the northern side and should
17 there be any vertical migration of water in all
18 probability it would occur toward the north and the
19 northwest because it is on the north and northwest
20 side of this particular blown sand deposit and it would
21 become lower in elevation as it progressed to the
22 north and northwest.

23 Q You are not saying that the general migration is not
24 toward the south and west, but only in this particular
25 location?

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1 A Because of the location of that particular pit, the
2 migration would probably occur, if it occurs at all,
3 to the north and northwest.

4 Q And that would be away from the Snyder Well; is that
5 correct?

6 A Correct.

7 Q How about to the east of the Snyder Well?

8 A In that particular location, the migration will, in
9 all probability, occur within a few feet of the surface
10 and on the surface or immediately below the surface, if
11 at all, and in a southwesterly direction.

12 It is in a low topographic position relative to
13 the two proposed pits previously discussed.

14 Q In your opinion, would there be any possibility of the
15 contamination of the water well located in Section 26?

16 A In my opinion, I cannot foresee any possibility of
17 contamination of the water zone in the water well at
18 the Ranch.

19 Q Now, what is the necessity for utilizing the surface
20 pits in this area, Mr. Harrington?

21 A The primary consideration for the Hanson Oil Corporation
22 is to allow us to produce oil from those zones which
23 produce both oil and water.

24 Disposing of those amounts of water in unlined
25 surface pits, the economics of disposal, are such that

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1 it would place our operation in the area in a generally
2 marginal classification in a relatively short period
3 of time if we cannot utilize surface pits.

4 If we have to utilize trucking to dispose of these
5 produced waters, we can foresee, just based on the
6 wells that are drilled and completed to date, an
7 expenditure in the vicinity of \$1,000 a month.

8 Should we have to seek out alternate methods of
9 disposal, our previous experience in converting wells
10 to water disposal wells has indicated to us that we
11 would be looking at an expenditure of some \$17,000 to
12 \$25,000 to convert to this type water disposal facility.

13 Q Is this in an area where there has been surface
14 disposal for a period of many years?

15 A Yes. If you will refer to Exhibit 1 in the north half
16 of Section 31, Township 18 South, Range 31 East,
17 exceptions have been granted by the Commission to Union
18 Oil Company of California, and the Great Plains Land
19 Company.

20 Union Oil Company has three producing wells and
21 on a well-by-well basis, have been disposing in unlined
22 surface pits, some 780 barrels of water per day.

23 The Great Plains Land Company is disposing on an
24 average of some ten to twelve barrels of water per
25 day in unlined pits.

- 1 Q Have you seen any evidence of surface damage as a
2 result of the use of those pits?
- 3 A I can't see other than some inconvenience that there
4 has been any damage to the surface.
- 5 Q Would you anticipate any surface damage at the site of
6 the pits you are proposing?
- 7 A None.
- 8 Q Mr. Harrington, were Exhibits 1 through 4 prepared by
9 you or under your supervision?
- 10 A Exhibits 1 through 5.
- 11 Q Exhibit 5 is a log?
- 12 A Correct.
- 13 Q And Exhibit 6 is a copy of a letter received by you
14 from the State Engineer's Office?
- 15 A Correct.
- 16 Q And Exhibits 7 and 8 are copies of water analyses made
17 at your request?
- 18 A Correct.
- 19 MR. KELLAHIN: At this time I will offer Exhibits
20 1 through 8 inclusive.
- 21 MR. UTZ: Any objections?
- 22 (No response.)
- 23 MR. UTZ: Exhibits 1 through 8 will be entered
24 into the record of this Case.)
- 25 (Whereupon Applicant's Exhibits 1 through 8 were

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1 admitted in evidence.)

2 Q (By Mr. Kellahin) Do you have anything to add,
3 Mr. Harrington?

4 A No, I have nothing further to add.

5 MR. KELLAHIN: That completes my examination of
6 this witness.

7 MR. UTZ: Any questions of this witness?

8 CROSS-EXAMINATION

9 BY MR. NEAL:

10 Q Mr. Harrington, you said in Section 22 you have a well
11 or a water tank outlined in blue in Section 22?

12 A Yes, sir.

13 Q And you stated this was the Duval waterline?

14 A Yes.

15 Q Aren't you mistaken and isn't the Duval waterline
16 considerably south from the water line of the well in
17 Section 26?

18 A If it is, I was not aware of that. In checking out
19 the field, I could find no line from the tank except
20 the one running to the east from it.

21 Q Did you not check from the tank in Section 26, Unit "J",
22 and, is there not a line running to the west that
23 connects with a little cylinder tank up there and then
24 gravity flows through Section 27, up to Section 22, and
25 over to Section 21, down to Sections 28 and 32, all from

1 this one well in Section 26?

2 A No, I was not aware of that. I was aware there was
3 a line from the well located in Unit "J" of Section 26
4 to the west of the tank which was located topographically
5 approximately in the northwest of the southwest of
6 Section 26.

7 Q Would you like to correct your testimony to this
8 Commission, that you cannot say that the tank in Section
9 22 is not supplied from this one in Section 26?

10 A Yes, I will correct that under the assurances from you
11 that this is the situation.

12 The information I obtained from my foreman was,
13 there was a line to supply the Duval Corporation Mining
14 Facility, and it was located in Section 27, coming from
15 the east in close proximity to the stock tank located
16 in Section 22 and then the line proceeded on to the
17 line operating in Section 27.

18 Q Could I refresh your memory as to Duval's facility
19 location in Section 22, that it is not just a shaft
20 and has nothing to do with their ore processing?

21 A Is that correct?

22 Q Is not their ore processing in Section 36 and Section
23 20 of Range 30 East?

24 A That may be.

25 Q And is that not where their water comes from?

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1 A I was not under that impression at the time I
2 prepared the information and made the statements which
3 I have made.

4 Q You then did not check yourself, personally?

5 A No -- yes, I have been to the tank at the location
6 in Section 22 and, from the observations I could make,
7 the line came from the east to the tank and proceeded
8 in a westerly direction and then south to the surface
9 facility of the Duval Corporation.

10 Q Do you know the area known as Walter's Lake?

11 A Yes.

12 Q Also, are you not acquainted with the fact that the
13 people on the Ranch and in the area refer to the Lake
14 at the Ranch House where the well is located as
15 Walter's Lake?

16 A No, I was not aware of that.

17 Q Is there not a dry hole tank at the house, right by
18 this well, of considerable surface acreage?

19 A In my investigation of the surface out there, it did
20 not appear to me that it was a tank, the only water
21 facility that I located was the well and a cement and
22 concrete enclosure containing water coming from the
23 well.

24 Q On your Exhibit Number 2, does that not show a light
25 blue Lake located in Unit "J" of Section 26?

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- 1 A No, it did not.
- 2 Q Do you have the original of Clayton Basin?
- 3 A Yes.
- 4 Q Is it something like this (indicating)?
- 5 A Yes, that is a copy similar to the one I have.
- 6 Q I hand you what has been marked Exhibit 2 of Snyder
- 7 Ranch, do you not see a little blue lake in that Unit
- 8 "J", a blue circle?
- 9 A Yes, I do.
- 10 Q Is that not right by the house in Unit "J", the Ranch
- 11 House?
- 12 A It would be approximately 500 feet from the Ranch
- 13 house.
- 14 Q In your observations, in checking this area out, did
- 15 you not also check the tank that the Ranch House used
- 16 for water from this well for drinking purposes?
- 17 A The conversation that our field foreman had with the
- 18 man who worked on the Ranch indicated that he hauled
- 19 in his own water for human consumption and the water
- 20 from the well was used for stock watering purposes.
- 21 Q This is hearsay testimony on your part; is that not
- 22 true?
- 23 A That is correct.
- 24 Q Your Exhibit Number 7, is a sample of that water?
- 25 A Yes, that is correct.

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1 Q Doesn't that fall within the acceptable standards
2 of the United States Public Health Service as
3 potable water?

4 A I am not familiar with the United States Health Service
5 as far as what is required for potable water.

6 Q Well, your chloride content does not exceed 250 parts
7 per million; does it?

8 A No, on this report it does not.

9 Q Neither does your sulphate concentrate?

10 A Sulphate is indicated on Exhibit 7 as 230 parts per
11 million.

12 Q And you are not acquainted with the recommended limits
13 of the United States Public Health Service that say
14 anything under 250 parts per million is considered good
15 water?

16 A I wasn't acquainted with that particular Regulation of
17 the United States Health Service, but I will accept the
18 fact.

19 Q On your Exhibit Number 8, you show you intend to dispose
20 on this Unit "J" water, water with a sulphate content
21 of 1,600 parts per million?

22 A Yes.

23 Q And chloride of 8,200 parts per million and this is
24 reflected by your Exhibit as including sodium and
25 potassium?

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- 1 A That is correct.
- 2 Q Exhibit Number 8?
- 3 A That is correct.
- 4 Q Did you ascertain -- what were your qualifications,
5 sir? What type of Engineer are you?
- 6 A I'm not an Engineer, I am a Petroleum Geologist.
- 7 Q Did you ascertain where the recharge to this well
8 might come from, the water recharge?
- 9 A No, I have not.
- 10 Q Referring to your Exhibit 1, the well located in Unit
11 "I" just to the west of the surface disposal located
12 in Unit "I", what did you state would be deposited with
13 that pit?
- 14 A The volume?
- 15 Q Yes, sir.
- 16 A Approximately seventy barrels of water per day.
- 17 Q Is not the flow of the surface from the pit in there
18 to the west and to the open lake near the Ranch House?
- 19 A It would be to the south and southwest according to
20 the topographic map.
- 21 Q Well, according to your Exhibit Number 2, could it not
22 be due west?
- 23 A I would anticipate, based on the topographic map, that
24 the drainage of water on the surface would be to the
25 south or southwest.

1 Q There are seventy gallons of water per day of the
2 quality expressed in your Exhibit Number 8?

3 A Seventy barrels, that's correct.

4 Q And you are one unit distance from the well west?

5 A By unit do you mean forty acre tract?

6 Q Yes, forty acre tract.

7 A Correct.

8 Q Then, in the same forty acre tract you intend to dispose
9 of one and one-half barrels per day?

10 A Yes, but utilizing two different pits. One is for the
11 volume of approximately forty barrels per day --
12 pardon me, thirty-eight and one-half barrels per day,
13 and the one to the south is for a volume of approximately
14 one and one-half barrels per day.

15 Q Well, I have forty in my notes, is that an error, sir?

16 A That would be a combination of both.

17 Q All right. Then right to the west you have an abandoned
18 pit?

19 A We never built it. We have drilled and plugged and
20 abandoned the well located 2,310 feet from the south
21 and west of that section.

22 Q Now, there is a well -- could that not be used for
23 the disposal of water, the one you just drilled?

24 A It is my opinion it could not be used based on the
25 amount of porosity that we have encountered and that

1 has been indicated by the electric log of that well.

2 Q I want you to go into detail of your price for \$1,000
3 per month for trucking, do you know of any area placed
4 within the immediate area where you could truck this
5 water and dispose of it?

6 A No, I am not personally aware of any specific location
7 where we could dispose of the produced water.

8 Q I refer you to Exhibit 2 of Snyder Ranch and the area
9 known as Laguna Gatuna, do you know whether or not
10 that has been declared by this Commission as a disposal
11 pit?

12 A It may well have been, I'm not personally aware of that.

13 Q Sir, are you saying that your Exhibit 5, I believe it is,
14 that there can be no -- that this type of surface --
15 subsurface prevents vertical communication from the
16 surface to 200 feet?

17 A I believe I stated that, in my opinion, it would be
18 highly unlikely that there would be any vertical
19 communication of water downward from the surface of the
20 ground to the depth at which it has been reported the
21 water supply for the well is.

22 Q Is that an impervious type of material?

23 A Yes, impervious.

24 Q Other than this one gamma ray log, have you checked
25 anything else? By that I mean core samples?

1 A We have drilled the well located in the northwest of
2 the southeast Section 24 which has been designated at
3 Hanson Oil Corporation Number 5, Ginsberg Federal.

4 This well was drilled with a cable tool and I have
5 examined the cable tool samples and distributed that
6 information to the Commission.

7 I might add further, that, in the reports to this
8 point, it shows a cable tool hole and we encountered no
9 water until we reached a depth of 3,665 feet, I believe.

10 Q In your Application, although I presume you have nothing
11 to do with it, you say there is no surface water in the
12 area that could be affected. Are you saying that this
13 water in Section 26, Unit "J", could not be affected?

14 A Yes.

15 Q What if you had an overflow of rain which happens in
16 this area every so often, within twenty years or so,
17 what if you had a deluge of rain in the area and
18 drainage overflowed your tanks, where would it go?

19 A In the first place, I don't foresee the possibility in
20 the immediate future of a deluge.

21 Q Well, it has happened. I have lived in that County
22 for forty-some odd years and it has happened.

23 A The surface water would be controlled by the topographic
24 distribution of sediments.

25 Q Could that not run into Unit "J"?

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1 A From where?

2 Q From just north of it, sir, and right to the west of
3 it, sir.

4 A In my opinion, no, it would not, because that location
5 is comprised of some forty-five feet of blown sand
6 ecology.

7 Q Is it not shown on the topographic map that the surface
8 elevation is higher both to the north and to the west
9 than it is at the Ranch?

10 A That is correct.

11 Q If it is higher, could the water not flow this way
12 (indicating)?

13 A It could possibly, if there was sufficient volume of
14 water, but this sand will absorb ninety percent of the
15 water.

16 Q In your study, did you determine how big the Ranch
17 area was?

18 A No.

19 Q Did you determine how many sections of land were watered
20 from this one well?

21 A No, I did not.

22 Q You don't have anything to present other than your
23 testimony as to the cost of disposal?

24 A No, I have not. However , the Commission can refer to
25 the Hearings which were held before this Commission in

1 regard to converting wells to water disposal wells
 2 in two instances which I am personally aware of and
 3 these Applications were by Hanson Oil Corporation.

4 Q How much oil is produced from these wells?

5 A In the well in the southeast half of the east half of
 6 Section 26, we are producing the top allowable which is
 7 eighty barrels per day, per well.

8 In the Louis Benson Well in the northwest of the
 9 southeast of Section 26, it is producing eighty barrels
 10 of oil per day.

11 Wells Number 12 and 13, also in the west half of
 12 the east half of Section 26, are producing at a rate
 13 of eighty barrels of oil per day.

14 Well 14 is now in the process of completion, at
 15 this time.

16 Q Actually, sir, this is enough information for my
 17 purpose. These wells are producing the top allowable --
 18 most of them?

19 A At this time, that is correct, some two to four months
 20 after initial completion.

21 MR. NEAL: That's all.

22 CROSS-EXAMINATION

23 BY MR. UTZ:

24 Q Since you are a Geologist, you might have an opinion
 25 as to the direction of recharge of the well in Section 26.

1 A In my opinion, based on what sketchy information I
2 have about the well, I would estimate that the direction
3 of recharge would be from the south and east.

4 Q What do you base that opinion on?

5 A On the structural configuration at the depth at which
6 water was reported.

7 Q Then if water was disposed of to the southwest, there
8 would be little likelihood of damaging the water source?

9 A I say that it is highly improbable there would be
10 any damage regardless of the direction of recharge of
11 the water because of the unlikelihood of downward
12 vertical migration of water from the surface.

13 Q There would be even less of a possibility if it was
14 disposed of to the southwest; isn't that right?

15 A Yes.

16 CROSS-EXAMINATION

17 BY MR. STAMETS:

18 Q Do you know what the other operators in the area are
19 doing with their produced water such as Yates Petroleum?

20 A No, I am not acquainted with the operations of other
21 operators.

22 Q So there may be disposal operations in there which you
23 possibly could tie into that you are not acquainted with?

24 A May I make this statement? To my knowledge, within an
25 area of approximately six miles around our particular

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1 operation out there, there is no disposal facility
2 available, to my knowledge.

3 Q Have you actually been down to the area and looked at
4 that dry lake?

5 A My testimony involved the area outlined in red on
6 Exhibit 1. I have been on the grounds over all of
7 that area.

8 Q Correct me if I am wrong, normally in an area where
9 there are dry lakes, if water does not leak out and
10 it totally evaporates, you have deposits of salt and
11 gypsum and this sort of thing on the lake bottoms; do
12 you generally agree with that?

13 A I think it is most unfortunate to generalize in any
14 case, but I will say that, in my investigations, that
15 I have been involved in in our operations out there
16 since last September, at no time have I seen any water
17 standing on the surface of the ground.

18 Q Well, was there any indication in the bottom of these
19 lakes of this? Were the bottoms of the lakes sandy
20 and silty or were they salty?

21 A Sandy and silty.

22 Q Caliche is totally impervious to the vertical migration
23 of water?

24 A It has been in instances, impervious.

25 Q I am asking you in 100 percent of the cases. Caliche is

1 totally impervious to the vertical migration of water?

2 A No, under the proper circumstances, there could be
3 vertical migration through it.

4 MR. PORTER: Has it rained there since last
5 September?

6 THE WITNESS: Not to my knowledge.

7 MR. PORTER: Then you would not expect to find
8 any water on the surface.

9 THE WITNESS: That is correct.

10 MR. UTZ: Are there any injection units in that
11 unit?

12 THE WITNESS: I'm sure there will be.

13 MR. UTZ: Is it possible to clean up this water
14 so it would be useful for water flooding?

15 THE WITNESS: I have no experience along that line
16 so I don't think I could answer that question adequately, but
17 I am certain that it would take a sizable expenditure to
18 clean up almost any water.

19 MR. UTZ: It has been done.

20 THE WITNESS: I am sure it has been done by others,
21 but not by us.

22 MR. UTZ: However, it might be expensive.

23 THE WITNESS: I am sure it would be based on
24 the cost of water treatment.

25 MR. UTZ: How expensive would it be to run off

1 the water in the immediate area of the well over where the
 2 pit was to the west of the water well in the north half of
 3 of the southwest quarter of Section 26, and dispose of it
 4 there?

5 THE WITNESS: In the first place, we would have
 6 to lay gathering lines from the Number 5 Ginsberg Federal
 7 located in Section 24, and then go to the west half of the
 8 east half of Section 25, and pipe it to the southern gathering
 9 point, which would be the least expensive method, and this
 10 would be located at the topographic low.

11 From that point, it would be pumped up over the
 12 topographic high to the location which you mentioned.

13 MR. UTZ: The surface does drain to the southwest?

14 THE WITNESS: That is correct.

15 MR. UTZ: How expensive would it be to pipe the
 16 water in the immediate area, I mean the water in Section 26,
 17 to the southwest?

18 THE WITNESS: That would require delaying it until
 19 gravity flow could be obtained directly south from the
 20 location of the Louis B. Benson Well, and the Number 12 and
 21 Number 13 Ginsberg Federal Wells.

22 The line could be laid to the south and it would
 23 approximate a distance of slightly over one-half a mile.

24 Once again, we would -- that would be just for
 25 those particular wells and just to replace the pit we have

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1 proposed there and the others would remain the same.

2 MR. UTZ: My concern is that we have a fresh
3 water well here in the immediate area and I am just groping
4 for an answer for you and for them to where you could dispose
5 of this water where it would not endanger this water well,
6 in any way.

7 THE WITNESS: Most certainly. In utilizing unlined
8 pits in the area south of the proposed location, it would be
9 impossible for it to contaminate the water supply at the
10 water well, at the Ranch.

11 I still contend that it is highly improbable there
12 will be any downward vertical migration of water from the
13 points which we have proposed utilizing these unlined pits.

14 MR. UTZ: Since these are top allowable wells,
15 wouldn't it be feasible economically to pipe the water out
16 of complete danger of contaminating this water well?

17 THE WITNESS: I think we also have to look at
18 the relatively rapid decline experienced in other wells in
19 the Shugart field.

20 This production we are obtaining, at the present
21 time, is initial production and this will not persist for
22 any length of time. At least it has not for any other wells
23 in the area.

24 MR. UTZ: Do you anticipate water production will
25 go up as oil production declines?

1 THE WITNESS: In a few instances in this area
2 there has been a decline in the amount of water and the
3 well still maintained the amount of oil, the top allowable
4 oil.

5 MR. UTZ: What about the other wells in the
6 area, the older wells, have you had a chance to observe them
7 to see whether water increased as oil decreased?

8 THE WITNESS: Yes, wells occupied by Union in
9 Section 31, 18 South, Range 31 East, have increased dramatically
10 from October to November.

11 The well located in the northeast quarter of the
12 northwest quarter of Section 31 in October, produced 220
13 barrels of water and in November produced 2,418 barrels of
14 water, and in December, 1,935. So there was a rather
15 dramatic increase in a relatively short period of time.

16 MR. UTZ: This can occur and you really have
17 no assurance that the volume of water you are asking to
18 dispose of might not increase as dramatically six months from
19 now?

20 THE WITNESS: That is correct, based on the
21 information we have today. From production tests we have
22 taken on our wells, that we operate, we have no reason to
23 believe that a similar situation might not occur for us at
24 some future time.

25 MR. UTZ: That's all I have.

REDIRECT EXAMINATION

1
2 BY MR. KELLAHIN:

3 Q I think one thing you overlooked in your discussion
4 of Exhibit 1, is that the area immediately south of
5 this area has been exempted from the provisions of
6 R-3221.

7 A Yes, I believe the exemption was granted at the same
8 time Order R-3221 was issued and has been designated
9 Order R-3221-B.

10 MR. KELLAHIN: That's all I have.

11 MR. UTZ: Any further questions?

12 (No response.)

13 MR. UTZ: If not, the witness may be excused.

14 (Witness excused.)

LAWRENCE SQUIRES

15
16 was called as a witness and, after being duly sworn, testified
17 as follows:

DIRECT EXAMINATION

18
19 BY MR. NEAL:

20 Q Would you state your name, please?

21 A Larry Squires.

22 Q Where do you live?

23 A Hobbs, New Mexico.

24 Q What is your profession?

25 A My formal education qualifies me as a Veterinarian. I

1 am now General Manager for Snyder Ranches.

2 Q And partner in the Ranch operations?

3 A Yes, sir.

4 Q Do you own some feed land located in Section 26,
5 Township 18 South?

6 A Yes, sir, it is defined as the northwest quarter of
7 the southeast quarter of Unit "J".

8 Q What is located on Unit "J", sir, as far as your
9 Ranch operations are concerned?

10 A A house, two water wells, a barn, and some corrals,
11 and what we commonly call Walter's Lake.

12 I know the map shows Walter's Lake a half a mile
13 north, but this is a little area just immediately east
14 of the house and it is commonly called Walter's Lake
15 and this camp has been called Walter's Camp for thirty
16 years.

17 Q Referring to Snyder Ranch's Exhibit Number 2, this
18 is Walter's Lake located in the northwest portion of
19 this Section?

20 A That is correct.

21 Q But the people on the Ranch and in the area have always
22 referred to the Lake at the Ranch as Walter's Lake?

23 A That is correct.

24 Q And that is what you have referred to -- well that is
25 what you referred to when we flew over the area, you

1 referred to that as Walter's Lake?

2 A That is correct.

3 Q Does water stand in the area, at any time?

4 A It doesn't stand in the Lake too long, however, when
5 we get a three to four inch rainfall, there is a
6 considerable amount of water there and this does happen
7 every other year, approximately.

8 In fact, I have seen the corral under water
9 from this Lake. There is a general depression in there,
10 some rather large sand dunes behind the house, but the
11 house sets immediately to the east of the sand dunes
12 and the water well, and immediately east of the barn,
13 another 100 yards or so, is the Lake.

14 Q You have checked the water in that well and does it
15 not compare with Exhibit 7 that has been introduced here?

16 A Yes. In fact, our analysis from the Southwest Laboratory
17 in Midland, Texas, was 135 parts chloride and 216 of
18 sulphate.

19 Q And that was taken on May 2nd, of this year?

20 A Yes. The standing water level in the well was 190 feet
21 and the well, as far as I can find, is 230 feet deep.

22 We have approximately 220 feet of pipe in the well.

23 I don't know who he was talking to when he said we
24 hauled water there, but we don't.

25 We do not haul water there, the water is piped

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1 through the house and we drink that water and it is
2 good water, in fact, it is the only good water in the
3 area now.

4 Q I hand you what has been marked Snyder Ranch's Exhibit
5 1, and perhaps you can tell us what you do with that
6 water from that well in your ranching operations.

7 A Exhibit 1 is our water tub and we pipe water approximately
8 five miles from this well at the house, and we pipe it
9 immediately to the top of the sand hills behind the
10 house and up on to the high point where we have a 500
11 barrel, I believe it's 500 barrel, storage tank in the
12 area.

13 Then we have a bypass where we can pump it under
14 pressure, we have a 100 pound pressure line, and we
15 pump it to another high point up in Section 21, that
16 is where that blue triangle is that he has in Exhibit
17 1, it's the water tank and we pump the water up to that
18 high point in Section 21. From there, the gravity
19 flows three miles to the southwest.

20 Q Along the gravity flow, do you have outlets for stock
21 watering?

22 A Yes, along it. In fact, I think there are five water
23 tubs all told. This water line was put in this direction
24 because, as we show in our Exhibit, there are three old
25 water wells along this line. Now these old water wells,

1 I don't have their exact depths because they long
2 since have been abandoned, but in my opinion, they
3 were contaminated anyway.

4 They are salty.

5 Q And you wouldn't use them for stock purposes?

6 A The cattle will not drink the water that's in them.

7 Q Referring to the Exhibit in Unit "J" where the Ranch
8 is located and where Little Walter's Lake is located,
9 is this kind of in a draw?

10 A Yes.

11 Q Is that reflected by Exhibit 1 of Snyder's Ranch?

12 A He used the depth of the interior survey map which
13 shows a high ridge over here (indicating) and another
14 ridge here (indicating); this whole area is a low
15 depression area and I have been there where it rained
16 four or five inches and that whole area runs quite a
17 bit of water to the south.

18 MR. UTZ: What area are you calling the lower
19 area?

20 THE WITNESS: The area I am speaking about is found
21 in the west by what is called Loco Hills and it is bounded
22 on the east by Cinnamon Ridge and includes Section 13, 14, 22,
23 23, 24, part of 25, 26, 27, 18, 30, 34, and parts of Sections
24 35, 18, and 30.

25 MR. UTZ: I think that is satisfactory.

- 1 Q (By Mr. Neal) How big is Snyder Ranch in this area?
 2 How many sections do you have under cattle cultivation?
 3 A It encompasses approximately ninety sections altogether.
 4 Q And Walter's Ranch utilizes this one well very considerable
 5 portion of that?
 6 A Walter's Lake Camp supplies probably about twenty
 7 sections of the north end of this area that I testified
 8 to earlier.
 9 Q Within your Ranch area out there, do you not have
 10 Duval's Mine in your Ranch area?
 11 A Yes, Duval Mine sets on another ranch which is
 12 approximately twenty-five miles from Walter's Lake area
 13 and we do have a water tub at the Duval main water line
 14 which runs from Cape Rock to the main mine site.
 15 Q That mine site, for the record, would be in Section 36,
 16 Township 20 South, Range 30 East?
 17 A I believe the site is in Sections 35, 20 and 30.
 18 Q And the water line from Cape Rock runs from the mine
 19 to Cape Rock in a northeasterly direction?
 20 A Well, it runs from Cape Rock to the southwest directly
 21 to the mine.
 22 Q As to locations, have you observed where these proposed
 23 pits are to be located, particularly the one in the
 24 east half of the southeast quarter of Section 26?
 25 A Very definitely.

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1 Q In your opinion, do you think this pit overflow will
2 contaminate Walter's Lake and the Ranch house?

3 A I sure think it could. Another thing, if I am not
4 mistaken, this gun barrel, I call it a gun barrel, it
5 is a big black tank by the pit there with what I think
6 is salt water going into it at the present time.

7 MR. NEAL: That's all.

8 CROSS-EXAMINATION

9 BY MR. KELLAHIN:

10 Q Mr. Squires, you say you are speaking about twenty
11 sections that are supplied by water from the well, have
12 you any indication as to the capacity of this well?

13 A It's adequate.

14 Q Like what?

15 A Well, it produces approximately twenty gallons a minute.
16 We have a submerged pump on it and we can pump 500 barrels
17 of water into the storage tank and it pumps this on a
18 one-inch line for a full two miles.

19 Q It pumps on a one-inch line for a full two miles?

20 A Yes.

21 Q What kind of pump do you use?

22 A It is a submergible pump.

23 Q What make?

24 A I don't know.

25 Q How many head of cattle are you running on the Ranch?

1 A I can't answer you at the present time because we don't
2 run cattle on this particular Ranch as a unit by
3 themselves. We move our cattle around quite extensively
4 and I could not answer you specifically. I can tell you
5 that in the area we generally run about eight to ten
6 animal units per section.

7 Q Not year around?

8 A Year around.

9 Q Eight to ten units per section?

10 A Yes.

11 Q And you have thirty sections?

12 A That are immediately involved with the well here.

13 Q And these are all supplied with water from the one
14 well?

15 A No.

16 Q Where else are you getting water from?

17 A Double Eagle Water has a section on top of the ridge
18 to the west about six miles back west.

19 Q Could you give me the township, range and section?

20 A No, I sure can't. I don't know exactly where the water
21 tub is, but if you will notice on this map right here.

22 Q I don't have that map.

23 A Let me show you. Here is a new well in Section 24 of
24 18, 30. This well doesn't have good water in it now
25 and we were forced to other uses and the Double Eagle

1 Water Company comes somewhere in this immediate area.

2 I'm not just sure where it is. There is an old
3 well in Sections 21 and 23 --

4 Q Are those wells being used?

5 A No, sir, they are not, they are salty.

6 Q You say you receive water from the Double Eagle Line
7 Company, can you give me the location?

8 A I know it's on the extreme eastern part of Walter's
9 Ranch.

10 Q Referring to your Exhibit Number 1, would you point out
11 exactly where the lake you refer to as Walter's Lake is
12 located?

13 A I have indicated it is right here in blue (indicating).

14 MR. UTZ: In Unit "J" of that Section?

15 THE WITNESS: Yes, sir -- well, it's right on
16 the line.

17 Q (By Mr. Kellahin) It is not actually shown on Exhibit
18 Number 2, is it?

19 A On this Exhibit here -- give me your pointer there and
20 I'll show you. You see this little old blue circle
21 there?

22 Q That is the Lake?

23 A That is the Lake.

24 Q Is that the total surface area as shown on Exhibit 2?

25 A No, the total surface includes the whole displaced area

1 right here.

2 Q But it is not indicated on the Department of Interior
3 Geological Survey Map as a lake other than by the
4 topographic line?

5 A It is shown by the little blue circle.

6 Q But Walter's Lake is up in the extreme north part of
7 the section and is shown as a lake?

8 A That is correct.

9 Q How long has it been since Walter's Lake has been full?

10 A I don't know, but the water percolates down very
11 rapidly and that's why it doesn't hold water.

12 Q It is all sand dunes?

13 A Yes.

14 Q And the sand dunes would absorb a considerable amount of
15 water?

16 A This whole area is sandy country, there are about five
17 acres or so of sand dunes.

18 Q If the sand continues immediately behind the house,
19 what direction would that be from your well?

20 A West.

21 Q Is there any to the north? Sand dunes?

22 A Yes, to the north and to the west. I can show you them
23 on the map if you would like.

24 Q I don't believe that is necessary. Do these sand dunes
25 intervene between the Hanson Well and your water well?

1 A I believe Mr. Harrington can correct me, but I believe
2 it is chiseled out, the Company moved a lot of sand to
3 build their location.

4 Q Did they move that to the south so it would be between
5 you and their well?

6 A Mr. Kellahin, I don't have any idea where they moved
7 it because they came in to drill the well without
8 notifying us they were even on the place.

9 Q There are sand dunes there regardless of how they
10 got there, between Hanson's Well and your water well?

11 A Partly.

12 MR. KELLAHIN: That's all I have. Thank you.

13 MR. PORTER: The Applicant is requesting several
14 disposal pits in the area outlined in Applicant's Exhibit
15 Number 1. Does your objection apply to all the disposal
16 pits outlined in red?

17 THE WITNESS: Yes, it does. We weren't aware that
18 the Hearing was as soon as it was, and I hired a hydrologist
19 to check the area because I don't want to impede anybody's
20 progress, but I certainly don't want our fresh water disturbed.

21 I feel that before any extensive area is designated
22 as an exception, certainly tests should be run, not just
23 casual observations.

24 We did hire a hydrologist and we have a letter from
25 him stating that it is quite likely that the disposed water

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1 would gravitate into the well and into the Lake and he would
2 want to be here and testify, but he could not because of some
3 prior commitment.

4 We have this letter here and I would like to read
5 it to you.

6 MR. KELLAHIN: I object to it.

7 THE WITNESS: What do you really want, the truth
8 on the thing and whether or not it will contaminate? This
9 is an expert opinion which we really need here today.

10 Don't we want to know for sure?

11 MR. KELLAHIN: We want to know for sure, but the
12 letter from a hydrologist who is not present subject to
13 cross-examination would not be favorable presentation of an
14 expert witness.

15 MR. NEAL: I am not offering it.

16 THE WITNESS: This water well does represent quite
17 a value to us.

18 MR. PORTER: Do you know how far it is from this
19 well to any other fresh water wells in the area?

20 THE WITNESS: We have another well, I can only
21 speak for our own wells, we do have another well which is
22 right here (indicating) in Section 19 -- that's Township 19,
23 30.

24 This well here is pretty bad, but its usable.

25 MR. PORTER: There is another fresh water well in

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1 the area outlined in red on Applica'n't Exhibit 1.

2 THE WITNESS: Yes, there are several water wells
3 which have already been contaminated.

4 MR. NEAL: How were they contaminated?

5 MR. KELLAHIN: I object to this line of
6 questioning. There is no testimony here that shows these
7 wells were ever fresh water wells.

8 MR. NEAL: There are two wells, are there not?

9 THE WITNESS: Yes.

10 MR. NEAL: And one is in use and the other is
11 not?

12 THE WITNESS: It's standby.

13 MR. KELLAHIN: Completed at the same depth and
14 under the same condition?

15 THE WITNESS: To my knowledge, it is.

16 MR. UTZ: Do you know?

17 THE WITNESS: Well, it's been there some thirty
18 years and we have not used it.

19 MR. UTZ: You have not used this well for thirty
20 years?

21 THE WITNESS: To my knowledge -- I haven't been
22 around that long -- there.

23 MR. NEAL: We would like to offer Exhibits Number
24 1 and 2.

25 MR. UTZ: Are there any objections?

1 (No response.)

2 MR. UTZ: Exhibits 1 and 2 will be entered into
3 the record of this Case.

4 (Whereupon, Snyder's Exhibits 1 and 2 were admitted
5 in evidence.)

6 MR. UTZ: Have you ever taken any water levels
7 out there to see if there is any relationship between heavy
8 rain in the area and the water level in the well?

9 THE WITNESS: No.

10 MR. STAMETS: When it rains, do the water levels
11 go up?

12 THE WITNESS: I only assume it does, that's why
13 I feel a study should be made before any exceptions are
14 granted.

15 MR. UTZ: So I understand your position, Mr. Squires,
16 you don't want a ruling on this Case until further studies are
17 made as to possible contamination of your fresh water zone?

18 THE WITNESS: In this immediate vicinity within
19 three miles of our water well, I certainly would object to
20 it. I wanted to object to the one earlier this morning, but
21 that's seven miles away, so I didn't bother. The fact that
22 some of these fellows can look around and cannot see windmills
23 on the horizon does not mean that there is not fresh water
24 in the area.

25 I think a more complete study has to be made than that.

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MR. UTZ: Any other questions of the witness?

(No response.)

MR. UTZ: If not, the witness may be excused.

(Witness excused.)

MR. UTZ: Any statements in the Case?

(No response.)

MR. UTZ: Any correspondence?

(No response.)

MR. UTZ: The Case will be taken under advisement.

I N D E XWITNESS:PAGEJERALD R. HARRINGTON

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LAWRENCE SQUIRES

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E X H I B I T SAPPLICANT'S (Hanson)OFFEREDADMITTED

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Exhibit 8	Surface Water Analysis	12	16

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SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

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1 (Exhibits continued)

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3 SNYDER RANCH

OFFERED

ADMITTED

4 Exhibit 1

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5 Exhibit 2

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