

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION  
STATE LAND OFFICE BLDG.  
SANTA FE, NEW MEXICO

5 September 1984

EXAMINER HEARING

IN THE MATTER OF:

Application of Yates Petroleum	CASE
Corporation for a Carbon Dioxide	8324
Injection Pilot Project and	
unorthodox locations, Eddy County,	
New Mexico.	

BEFORE: Gilbert P. Quintana, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation	Charles E. Roybal
Division:	Attorney at Law
	Energy and Minerals Dept.
	525 Camino de Los Marquez
	Santa Fe, New Mexico 87501

For the Applicant:

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2  
3 MR. QUINTANA: We'll call next  
4 Case 8324.

5 MR. ROYBAL: Case 8324,  
6 application of Yates Petroleum Corporation for a Carbon  
7 Dioxide Injection Pilot Project and unorthodox locations,  
8 Eddy County, New Mexico.

9 Mr. Examiner, the applicant has  
10 requested a continuance of this case.

11 MR. QUINTANA: Case 8324 will  
12 be so continued until September 19, 1984.  
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## C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY  
that the foregoing Transcript of Hearing before the Oil Con-  
servation Division was reported by me; that the said tran-  
script is a full, true, and correct record of the hearing,  
prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is  
a complete record of the proceedings in  
the Examiner hearing of Case No. 8324  
heard by me on SEPT. 5 1984.

Gilbert P. Quintana Examiner  
Oil Conservation Division

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION  
STATE LAND OFFICE BLDG.  
SANTA FE, NEW MEXICO

19 September 1984

EXAMINER HEARING

IN THE MATTER OF:

Application of Yates Petroleum  
Corporation for a carbon dioxide  
injection pilot project and un-  
orthodox locations, Eddy County,  
New Mexico.

CASE  
8324

BEFORE: Michael E. Stogner, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation  
Division:

Jeff Taylor  
Attorney at Law  
Legal Counsel to the Division  
State Land Office Bldg.  
Santa Fe, New Mexico 87501

For the Applicant:

Chad Dickerson  
Attorney at Law  
LOSEE, CARSON, & DICKERSON  
Post Office Drawer 239  
Artesia, New Mexico 88210

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I N D E X

EDWIN ROBERT TISDALE

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3 MR. STOGNER: We will now call  
4 Case Number 8324.

5 MR. TAYLOR: Application of  
6 Yates Petroleum Corporation for a carbon dioxide injection  
7 pilot project and unorthodox locations, Eddy County, New  
8 Mexico.

9 MR. DICKERSON: Mr. Examiner,  
10 I'm Chad Dickerson of Artesia, New Mexico, appearing on be-  
11 half of the applicant.

12 We have one witness.

13 I'd like to point out that the  
14 location of the well (b) described in the application and on  
15 the docket is in error, and that well is in fact 2475 feet  
16 from the south line and 10 feet from the east line.

17 MR. STOGNER: An error of that  
18 magnitude we will -- that will have to be readvertised.

19 That, Mr. Dickerson, is (b),  
20 the West Loco Hills Unit Tract 6-5?

21 MR. DICKERSON: That's correct.

22 MR. STOGNER: That should be  
23 located 2475 feet from the south line and 10 feet from the  
24 east line?

25 MR. DICKERSON: That's correct.

MR. STOGNER: Thank you, Mr.  
Dickerson. Please continue.

MR. DICKERSON: I have one wit-

ness, Mr. Examiner.

MR. STOGNER: Are there any other appearances in this matter?

Will the witness please stand and be sworn?

(Witness sworn.)

EDWIN ROBERT TISDALE,  
being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. DICKERSON:

Q Mr. Tisdale, will you give your name and your occupation and where you reside, please?

A My name is Edwin Robert "Bob" Tisdale. I'm an engineer with Yates Petroleum Corporation, Artesia, New Mexico, and I reside in Artesia, New Mexico.

Q You have previously qualified as a petroleum engineer before this Division --

A Yes, I have.

Q -- and testified previously?

MR. DICKERSON: Is this witness satisfactory, Mr. Examiner?

MR. STOGNER: Yes, he is.

Q Mr. Tisdale, you are also familiar with

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the proposed -- the application filed by Yates Petroleum Corporation in Case 8324?

A Yes, I am.

Q Would you briefly summarize the purpose of Yates' application?

A Yes. Yates Petroleum Corporation seeks authority to inject CO2 and water in the Grayburg formation in the two wells to be drilled in the West Loco Hills Unit at unorthodox -- unorthodox locations.

These two wells are part of the CO2 pilot project designed to test the CO2 miscible process in the 4th Grayburg Sand, commonly referred to as the Loco Hills Sand.

If the CO2 pilot project indicates the process is successful, the project would be expanded to include additional wells and result in the production of otherwise unrecoverable oil, thereby preventing waste.

Q Mr. Tisdale, is the West Loco Hills Grayburg Unit an existing authorized secondary recovery unit?

A Yes, it is.

Q And that was approved by this Commission in 1962, by Orders R-1267 and R-2178, was it not?

A Order R-1267 approved secondary operations in the area to the east of the West Loco Hills Unit.

Order R-2178, I believe, approved water-flood secondary recovery operations in the West Loco Hills Unit itself, yes.

MR. STOGNER: Excuse me. What



1  
2 was the second order?

3 MR. DICKERSON: 2178.

4 MR. STOGNER: Thank you.

5 Q What is the current status of the second-  
6 dary recovery operations in that unit?

7 A The West Loco Hills secondary recovery  
8 operations are at the end of their useful life.

9 The original waterflood was designed to  
10 last approximately ten years, that is, into the early seven-  
11 ties.

12 In the early seventies we had the oil em-  
13 bargo and the higher prices for oil. The operator at the  
14 time, Eumont Oil Company, continued operating this marginal  
15 waterflood up to the time that Yates Petroleum took Eumont's  
16 interest in February of this year.

17 Q And Yates has also succeeded Eumont as  
18 operator of that West Loco Hills Grayburg Unit?

19 A Yes. Yates Petroleum was elected unani-  
20 mously as successor unit operator.

21 Q Is the unitized formation as defined in  
22 the orders to which you previously referred the Examiner the  
23 same formation that you propose to conduct your pilot CO2  
24 project within?

25 A It is.

Q Mr. Tisdale, refer to what we have marked  
as Exhibit Number One, which is the C-108 submittal, and  
turn to the map attached as part of that submittal and di-

rect the Examiner's attention to what is shown on that map.

A All right. This is a map of the area of the CO2 pilot project. The CO2 pilot project is outlined in red, roughly to the center of this map.

The large circle on the map indicates a 2-mile radius around each of the proposed CO2 injection wells. At the center of -- at the top of this pattern a 10-acre inverted 5-spot and at the bottom of this pattern is a 22-1/2-acre inverted 5-spot.

The smaller circle indicates radiuses of 1/2-mile around each of these proposed CO2 injection wells, which is the area of review.

Q Point out the boundaries of the West Loco Hills Grayburg Unit --

A All right.

Q -- indicated on that map.

A This heavy dashed line that you see in roughly the center and off to the west side, is the existing boundary of the West Loco Hills Unit.

Q And you stated that if the project proves successful, Yates proposed to ultimately expand this unit to the remainder of the -- of the waterflood project, or the CO2 project, excuse me, to the balance of the West Loco Hills Grayburg Unit?

A That is correct.

Q Now with respect to the wells within the one-half mile area of review surrounding your proposed in-

1  
2 jection wells, Mr. Tisdale, summarize the status of those  
3 wells for the Examiner.

4 A All right. There are both plugged and  
5 abandoned wells -- there are plugged and abandoned wells.  
6 There are active producing wells. There are active injec-  
7 tion wells, and there are temporarily abandoned producing  
8 wells within the half-mile radius of the CO2 injection pi-  
9 lot.

10 Q And you have attached to your C-108 sub-  
11 mittal a tabulation of the history of each of those wells  
12 within that half-mile area of review which have penetrated  
13 your proposed injection interval?

14 A That is correct.

15 Q Mr. Tisdale, directing your attention to  
16 your proposed injection wells, these wells are not yet cur-  
17 rently drilled, are they?

18 A That is correct.

19 Q And when you drill those wells what cas-  
20 ing program do you anticipate utilizing?

21 A We intend to set 8-5/8ths casing on top  
22 of the salt at about 400 feet. Cement will be circulated  
23 behind this string of casing to surface.

24 We then intend to drill down through the  
25 Loco Hills Sand with about 50-foot of rathole, and set 5-1/2  
inch production string and cement it back to surface.

Q Do you anticipate the possibility of any  
problems, Mr. Tisdale, regarding the location of the pilot

1  
2 project as we have shown it on the map?

3 A We have by no means completely determined  
4 the final location of these CO2 injection wells.

5 The pilot project includes five existing  
6 wells which we are going to try to convert over to producing  
7 wells.

8 One new producing well will be drilled.  
9 If upon entering these wells and testing these wells we de-  
10 termine that one or more of them cannot be used in the pi-  
11 lot, we may have to select other existing wells for the pi-  
12 lot in this area and drill the CO2 injection wells at dif-  
ferent locations.

13 Q And you would request that the Division  
14 authorize some type of administrative approval for that --  
15 in the event that you cannot use the pilot project as pre-  
sently anticipated?

16 A Yes. Basically the area of the CO2 pilot  
17 pattern that we have outlined here, which we want to call  
18 the CO2 Pilot Area, which is the west half of Section 7, 18  
19 South, 30 East, and the east half of Section 12, 18 South,  
20 29 East, is the only area of the Loco Hills Unit that is  
21 presently pressured up, that has sufficient reservoir pres-  
22 sure to make the CO2 miscible process work.

23 We could locate these wells within this  
24 area and make the CO2 process work.

25 Q What tubing program do you plan to uti-  
lize in your injection wells?

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2           A           The tubing will be 2-7/8ths-inch tubing  
3 or possibly 2-3/8ths-inch tubing internally coated with a  
4 plastic called Spin Coat.

5                       MR. STOGNER:   Excuse me, Mr.  
6 Tisdale, is that 2-7/8ths or 2-3/8ths?

7           A           The -- what we plan to put in the hole  
8 right now is 2-7/8ths-inch tubing.

9                       MR. STOGNER:   I'm sorry, go a-  
10 head.

11           A           This is by no means completely deter-  
12 mined. We have not ordered or purchases this tubing yet.  
13 It could be 2-3/8ths.

14                       The present plans call for 2-7/8ths.

15           Q           And what packer assembly do you propose  
16 to use?

17           A           Present plans are for a Watson JY Packer,  
18 which would be set just above the perforations and we may  
19 have an on/off tool on this packer and a valve may be closed  
20 so we can remove and replace the tubing string without un-  
21 seating the packer.

22           Q           And is your injection program an open or  
23 closed system?

24           A           This will be a closed system.

25           Q           What is the average and maximum daily  
rate in volume of fluid that you anticipate disposing -- or  
injecting?

The rates are -- first of all, this is

1  
2 probably going to be a water, alternately gas, injection.  
3 The cycle could be as short as one month; in other words, 15  
4 days of CO2 injection followed by 15 days of water injection.  
5

6 We want to try to inject 40 tons of CO2 a  
7 day during the CO2 phase of the cycle and a volume of the  
8 equivalent amount of water during the water cycle, which is  
9 about 225 barrels per day.

10 Let's see. An average reservoir pressure  
11 of at least 950 psi must be maintained if the CO2 miscible  
12 process is to work in the Loco Hills Sand.

13 Bottom hole injection pressures well  
14 above 950 psi must be maintained to achieve proposed injection  
15 rates. Water is presently being injected into the Loco  
16 Hills Sand at a surface pressure of about 1100 to 1200 psi.  
17 Water has been injected in Loco Hills Sand at a surface  
18 pressure of 1350 psi without any dramatic increase in rate  
19 that would be expected if formation parting had occurred.

20 Instantaneous shutdown pressures are on  
21 the order of 1500 psi surface pressure in the CO2 pilot project  
22 area. This is information gathered from fracture  
23 treatments in the last decade.

24 Yates Petroleum Corporation expects to be  
25 able to maintain adequate injectivity at from 1100 to 1200  
psi injectivity -- psi surface pressure.

Surface injection pressure can safely go  
as high as 1500 psi without formation parting. In no case

1 shall the surface injection pressure exceed the surface  
2 equipment rating of 2000 psi.

3 Q What are the sources of the water to be  
4 injected into the formation and what information do you have  
5 regarding compatibility of that water with the injection  
6 zone?

7 A The first possible water to inject would  
8 be fresh water purchased from the Maljamar fresh water sys-  
9 tem via pipeline.

10 The second possibility for injection  
11 water would be produced water produced from the West Loco  
12 Hills Unit.

13 Q And you have attached water analyses of  
14 produced water?

15 A Not -- I don't have an analysis of the  
16 produced water.

17 Q Do you anticipate using produced water  
18 initially or only fresh water?

19 A For the CO2 pilot at least initially we  
20 only anticipate using fresh water.

21 Q Now, a geological description has been  
22 and is on file with the Division in the previous orders  
23 which approved the West Loco Hills Unit, is it not?

24 A Yes.

25 Q What is the exact injection interval, as  
far as your perforations are concerned within the unitized  
interval?

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A            We -- in the CO2 pilot area we will not know the exact injection interval until we drill the wells, but from offset wells we believe that we will be injecting at about 2800 feet and the interval will be, oh, some 20 or 30 feet thick in these proposed injection wells.

Q            Are there any sources of underground drinking water in the area?

A            There is fresh water in the area. This water probably comes from the Rustler formation at about from 200 to 300 feet in depth. This water is not of good quality, generally. It is expensive to lift to the surface and it's limited in quantity.

             This is probably why the fresh water wells in the area were abandoned and the fresh water pipeline came to the area for water injection projects.

             As far as drinking water, we do know that people did drink this water but the main purpose for this water was to feed livestock.

Q            And you have attached an analysis of that fresh water to your submittal.

A            Well, we have in here an analysis of the fresh water that is purchased from the Maljamar Water Company.

Q            What is your proposed stimulation program for your injection wells?

A            This, of course, has not been completely determined. We expect that we will only have to stimulate



1 with a small acid job that is less than 10,000 gallons of  
2 acid.

3 Q Are logging and test data on the wells to  
4 be submitted to the Division as they are drilled?

5 A That is correct.

6 Q Mr. Tisdale, you have examined all avail-  
7 able engineering data and have you determined whether or not  
8 there is any evidence of open faults or any other hydrologic  
9 connection between the injection interval and the sources of  
10 fresh water in the area?

11 A I have examined all available data.  
12 There appears to be no such faults.

13 Q Okay. Directing your attention to what  
14 is marked Exhibit Number Two, the proof of notice, that is  
15 merely the affidavit of mailing, reflecting notice of  
16 mailing of the application, notice of this hearing, to  
17 surface owners in the area of the injection wells, is that  
correct?

18 A That's correct.

19 MR. DICKERSON: Mr. Examiner, I  
20 move admission of Applicant's Exhibits One and Two at this  
21 time.

22 MR. STOGNER: Exhibits One and  
Two will be admitted into evidence.

23 Q Mr. Tisdale, what would you request that  
24 the Division do with regard to expansion of the CO2 project  
25 in the event it proves successful?

1  
2           A           Yates Petroleum Corporation requests that  
3 it be allowed to expand the CO2 flood to additional wells to  
4 be drilled at orthodox and unorthodox locations within the  
5 West Loco Hills Unit upon filing written request therefore  
6 with the Division Director.

7                       That is, what we're asking for is admini-  
8 strative approval of these authorizations to inject CO2.

9           Q           And can you cite the Examiner to a case  
10 in which something similar was accomplished?

11           A           Yes. Conoco came before this Commission  
12 and in Order Number R-6157, part number 13, they were grant-  
13 ed similar requested -- a similar order for such extension.

14           Q           Mr. Tisdale, in your opinion would the  
15 granting of this application be in the interest of conserva-  
16 tion, the prevention of waste, and the protection of corre-  
17 lative rights?

18           A           Yes.

19                       MR. DICKERSON: Mr. Examiner, I  
20 have no further questions of this witness.

21                       MR. STOGNER: Thank you, Mr.  
22 Dickerson.

#### 23 CROSS EXAMINATION

24 BY MR. STOGNER:

25           Q           Mr. Tisdale, in your well data, the pack-  
er that you plan to use, has that particular packer been  
used on other CO2 projects in the area? I mean anywhere

1  
2 else?

3           A           I cannot cite a specific example right  
4 now. The Watson packer salesman told me that it had been,  
5 yes.

6           Q           And so it's been proven and then graded  
7 for CO2?

8           A           Yes, sir. I might also say that the  
9 exact packer has not been completely determined. We are  
10 looking also at Guiberson packers and other vendors packers.  
11                   And we will run equipment that is suit-  
12 able for CO2 service.

13           Q           The production, the oil production, hy-  
14 drocarbon production in this area, does it have traces of  
15 H2S in it?

16           A           Yes.

17           Q           Do you expect -- do you know any amounts?

18           A           No, I really don't at this time. The --  
19 the unit has been very poorly maintained over the last ten  
20 years. Almost all of the tanks, well, all of the tanks have  
21 holes in the top of the tanks. They do not collect H2S.

22                   The, all of the gas that was produced  
23 from these wells was piped directly into the fuel line and  
24 burned along with the fuel used to run the motors that ran  
25 the pumped gas in, the water injection motors, and the in-  
jection plant.

Right now what is happening is this pro-  
duced gas, this small amount of casinghead gas, is being

1  
2 routed into the flow lines in most of these producing wells;  
3 goes to the tank battery; evolves off the gas -- off of the  
4 oil in the tank battery through the top of the tank and is  
dissipated in the atmosphere.

5 Q The five producing wells that you show on  
6 your map immediately offsetting the two proposed CO2 injec-  
7 tion wells, are those described in any part of your exhi-  
8 bits?

9 A They are in the well data in the -- for  
10 the review area, yes.

11 They are Wells -- they are Wells 1-1, 1-  
12 -- excuse me, not 1-1. 1-2, 1-3, 1-8, 6-1, and 13-4.

13 Q Well, in that case could you tell me what  
14 page that's shown on in your tabulation of well data in your  
Exhibit One?

15 MR. DICKERSON: It's not num-  
16 bered, Mr. Examiner, but it's under the Roman Numeral VI at  
17 the top of the page, Tabulation of Well Data, and that and  
18 the succeeding page.

19 Q Well, each well is separated by a letter.  
20 Could you specifically go to which one?

21 A Oh, okay. Okay, Well Number 1-2 is let-  
22 ter M.

23 Well Number 1-3 is letter N.

24 Well Number 1-8 is letter S.

25 Well Number 6-1 is letter A.

Well Number 13-4 is letter F.

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Q Is what, I'm sorry?

A F.

Q F. Well, taking a close glance at these, I notice that these are fairly old wells, are they not?

A They are.

Q Do you have a figure on the top of the cement on these wells?

A No. These -- these wells were drilled with cable tool rigs and typically they were cemented with the -- the casing was set on top of the Loco Hills Sand and cemented using the Halliburton method, which I believe is pumping cement with mud following it and circulating -- trying to circulate the cement behind the casing.

We do not in general have any records of the exact type of cement used, how it was mixed, what the size of the hole actually was. It was not actually calipered before the cement job was run.

But, for instance, on the plugged and abandoned wells, that's, I believe 13-1 and 13-5, and 6-3, where 7-inch casing was set in a hole that should have been about 8 inches, figuring with Class E cement, we should have had cement come up to about 1400 feet above the casing shoe.

That cement, typically, from the information we have, did not come up as high as that. We were able to -- Eumont Oil Company, anyway, when they were plugging wells, they were able to squeeze below that.

There should be at least a few hundred

1 feet of cement in these wells above the casing shoe.

2 There were no temperature surveys run to  
3 determine these tops independently, a calculation like that.

4 What we intend to do in these wells is to  
5 enter them and attempt to repair them and we may run a bond  
6 log or we may just attempt to squeeze the wells, and circu-  
7 late, try -- try to put as much cement as possible behind  
8 the casing. We would like to circulate cement to the sur-  
9 face. That may not be possible because we don't think we  
10 can circulate past the salt zone.

11 The next best thing we will try to do is  
12 try to put cement up to the salt, bottom of the salt, and  
13 squeeze behind the casing on top of the salt up to the sur-  
14 face.

15 Failing that, there may be something in-  
16 volved in the casing and we may not be able to do that.  
17 Failing that, we would squeeze, if necessary, in the casing  
18 string below the salt, above the salt, and try to squeeze  
19 off the surface, too, and -- which would essentially leave  
20 the well in what is considered now a properly plugged condi-  
21 tion. Drill out, set a liner, and circulate behind that  
22 liner, cement to surface.

23 Q The wells immediately offsetting the in-  
24 jection wells.

25 A That's correct, the producers that we're  
getting as part of the pilot project.

Q If there were any wells that need to be

1  
2 repaired within the half mile radius, is Yates prepared to  
3 do that, also?

4 A Yes, we are.

5 Q The injection pressure that you are pro-  
6 posing on the paper on page three entitled Loco Hills CO2  
7 Pilot Flood C-108, you show 2000 psia -- 2000 psi, is that  
8 right?

9 A As a maximum injection pressure, yes.  
10 All of our designs are created for surface, but it will be  
11 raised to 2000 psi. That's the maximum injection pressure  
12 that the surface equipment will tolerate.

13 As I testified, I think that we will be  
14 able to maintain injectivity at a pressure of 1100 to 1200  
15 psi, which we are presently doing in the field.

16 From the evidence we have, we believe we  
17 can safely inject to 1500 psi without parting the formation.  
18 If we -- we would like an order written to give us a maximum  
19 injection pressure of 1500 psi.

20 If we needed to inject at a higher pres-  
21 sure we could run step rate tests.

22 Q Do you have a step rate test for the 1500  
23 psi at present? Are there ones that have been run or has  
24 any of the wells in the surrounding area been injecting for  
25 a considerable amount of time at 1500 psi or above?

A No, the maximum injection pressure in the  
unit has been 1350 psi surface pressure. There have been no  
step rate tests run.

1  
2 At the time that the secondary recovery  
3 operations were approved there were no limitations on sur-  
4 face injection pressures.

5 Q Do you plan to start out at 1500 psi on  
6 your pilot project or do you propose to start at a lower in-  
7 jection rate and then work up, or what is your plan?

8 A The plan is that -- that we will try to  
9 obtain these rates of 40 tons of CO2 per day and 225 barrels  
10 of water per day. We believe we can do that with a pressure  
11 of 1100-1200 pounds. That's where we plan to start.

12 If we cannot inject at 11-1200 pounds,  
13 we will try to increase the pressure of the injectivity. We  
14 might increase it up to 1500 psi.

15 Let me point out that the worst thing  
16 that could happen to us, we could part the formation and  
17 have a direct channeling of CO2 to one of these producer  
18 wells, so we do not intend to inject at a pressure that  
19 would cause parting the formation, possible breaks and pro-  
20 duction loss.

21 Q Are you producing to, as part of your  
22 operations, to run a step rate test before you commence in-  
23 jecting to see that 1500 psi won't split the formation?

24 A We did -- we did not have plans to do  
25 that. We plan to just operate the wells.

MR. DICKERSON: Tell the Exam-  
iner about the data you have regarding -- that you learned  
from the fracturing operations on various wells in the area.



1  
2           A           We have data from -- from two wells in  
3 the area that were -- that were fracture treated.

4                   The first well that I have these data on  
5 is the West Loco Hills Unit Tract 1-3. This the well in the  
6 southeast corner of the pilot pattern.

7                   On February 29th of 1968 this well was  
8 fracture treated down casing with 460 barrels of salt water  
9 and 15,000 pounds of 20/40 mesh sand.

10                  The instantaneous shutdown pressure was  
11 1500 psi. To five minutes it had gone down to 1400 psi; af-  
12 ter ten minutes, 1350; after fifteen minutes, 1300 psi.

13                  On September 19th, 1971, this well was  
14 fracture treated again down casing with 410 barrels of lease  
15 crude and 22,500 pounds of 20/40 mesh sand.

16                  The instantaneous shutdown pressure was  
17 1400 psi; after ten minutes it was down to 1325 psi.

18                  The other well in the area was Loco Hills  
19 Unit Tract 13-4. This is the well in the northwest corner  
20 of the proposed pilot project area, or pressure pattern.

21                  On March 5th, 1968, this well was frac-  
22 ture treated down the annulus with 395 barrels of lease  
23 crude and 7500 pounds of 20/40 mesh sand.

24                  The instantaneous shutdown pressure was  
25 1700 psi; after five minutes it dropped to 1500 psi; after  
26 ten minutes, 1450 psi; and after fifteen minutes 1400 psi.

27                  On October 5th, 1972, this well was frac-  
28 ture treated down tubing with water, crude, sand and salt.

1  
2 Instantaneous shutdown pressure was 1650  
3 psi; after fifteen minutes it had dropped to 1600 psi.

4 Q So what conclusion do you draw from this  
5 information?

6 A Well, the instantaneous shutdown pressure  
7 usually considered in the fracture business is the pressure  
8 at which the formation would part, or in this case, the  
9 pressure at which it closes up or gives up around the (not  
understood.)

10 It's a rough estimate of the parting  
11 pressure of the formation.

12 This is a -- all this work was done at a  
13 time when the waterflood was active and the reservoir was  
14 pressured up, like it is now in this area and should be at  
the time that we inject CO2.

15 So we expect to experience very similar  
16 parting pressures in the CO2 wells.

17 Q Would you send some information on the  
18 frac job on the 13-A and the other well that you previously  
19 described?

20 A Yes.

21 Q And I'd like to make that part of the re-  
22 cord for this case file.

23 And that will be a supplement to Exhibit  
24 One, will be adequate.

25 What is the present reservoir pressure in  
this area at this time?

1  
2           A           We have been quoting a nominal average  
3 reservoir pressure of 1200 psi, which is well above the min-  
4 imum miscibility pressure.

5                       We estimate this from the fluid levels in  
6 existing temporarily abandoned wells.

7                       Well No. 13-4 had a wellhead pressure of  
8 about 50 psi.

9                       Well No. 1-2 had a wellhead pressure of  
10 about 231 psi.

11                      So basically what we're talking about is  
12 the weight in the fluid column. This fluid should be some-  
13 thing on the order of 1200 psi at the reservoir depth.

14           Q           Do you have any idea what the original  
15 reservoir pressure was in this area?

16           A           We have an idea. We don't have any firm  
17 data, but the original reservoir pressure was approximately  
18 1000 psi.

19           Q           Do you know of any casing failures or  
20 tubing failures within this area due to corrosion on the  
21 tubular goods? Has that been a problem?

22           A           Yes, sir.

23                      We are presently repairing an active in-  
24 jection well, Well No. 1-4. This well had tubing and a pac-  
25 ker set in the hole and was injecting water. Water began to  
appear at the surface at the tubing/casing annulus, and we  
recently pulled the tubing out of this well and found a hole  
in that tubing very near the surface.

1  
2 We are right now attempting to repair  
3 this well. When we went out to repair the well we lifted up  
4 the tubing and the wellhead came with it, and we have dug  
5 out around the wellhead and trying to find competent casing  
6 and we have dug down ten feet and have not yet found compe-  
tent casing.

7 We would be better off if there were no  
8 casing in these holes at all. We could just recase them and  
9 we'd be all right, but the problem is that we cannot easily  
10 extract the existing casing from these wells without jeopar-  
11 dizing our ability to repair the wells or to plug them pro-  
12 perly. So we have an elaborate and expensive procedure for  
13 squeezing behind existing casing and repairing the wells  
that way.

14 MR. STOGNER: I have no further  
15 questions of this witness at this time.

16 Is there any other questions of  
17 Mr. Tisdale?

18 MR. DICKERSON: No.

19 MR. STOGNER: Is there anything  
20 further in Case Number 8324 this morning?

21 If not, this case will remain  
22 open pending readvertisement for the next available hearing  
23 and also pending the receipt of the subsequent data I have  
mentioned earlier.

24 Is there anything further in  
25 Case Number 8324?

MR. DICKERSON: No.

## C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY  
that the foregoing Transcript of Hearing before the Oil Con-  
servation Division was reported by me; that the said tran-  
script is a full, true, and correct record of the hearing,  
prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is  
a complete report of the hearing held in  
the Oil Conservation Division on case no. 8324  
heard by me on Sept. 19 1984.

Michael P. Hagan Examiner  
Oil Conservation Division

STATE OF NEW MEXICO  
ENERGY AND MINERALS DEPARTMENT  
OIL CONSERVATION DIVISION  
STATE LAND OFFICE BLDG.  
SANTA FE, NEW MEXICO

17 October 1984

EXAMINER HEARING

IN THE MATTER OF:

Application of Yates Petroleum  
Corporation for a carbon dioxide  
injection pilot project and un-  
orthodox locations, Eddy County,  
New Mexico.

CASE  
8324

BEFORE: Gilbert P. Quintana, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the Oil Conservation  
Division:

Jeff Taylor  
Attorney at Law  
Legal Counsel to the Division  
State Land Office Bldg.  
Santa Fe, New Mexico 87501

For the Applicant:

MR. QUINTANA: We'll call next  
Case 8324.

MR. TAYLOR: The application of  
Yates Petroleum Corporation for a carbon dioxide injection  
pilot project and unorthodox locations, Eddy County, New  
Mexico.

This case has already been  
heard, and it was readvertised because of a mistake. Are  
there any other appearances or evidence?

MR. QUINTANA: In that case  
Case 8324 will be taken under advisement.

(Hearing concluded.)

## C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY  
that the foregoing Transcript of Hearing before the Oil Con-  
servation Division was reported by me; that the said tran-  
script is a full, true, and correct record of the hearing,  
prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is  
a complete record of the proceedings in  
the Examiner hearing of Case No. 8324,  
heard by me on OCT. 17 1984.

Gilbert P. Quintana Examiner  
Oil Conservation Division