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CASE 7104: CONOCO INC. FOR THE AMEND-MENT OF ORDERS NOS. R-4633 and WFX-462, LEA COUNTY, NEW MEXICO

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Case No.

7104

Application

Transcripts

Small Exhibits

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STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING:

> CASE NO. 7104 Order No. R-4633-A

APPLICATION OF CONOCO INC. FOR THE Amendment of orders nos. R-4633 And WFX-462, Lea County, New Mexico.

ORDER OF THE DIVISION

BY THE DIVISION:

>--

This cause came on for hearing at 9 a.m. on December 10, 1980, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this <u>14th</u> day of January, 1981, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS

(1) That due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Conoco Inc., seeks the amendment of Division Orders Nos. R-4633 and WFX-462, which authorized the injection of water into applicant's Maljamar Mitchell Waterflood Project, Lea County, New Mexico.

(3) That said orders authorized the injection of water into the Grayburg-San Andres formation in the following described wells in Section 5, Township 17 South, Range 32 East, NMPM, Maljamar Pool, Lea County, New Mexico:

	Grace	Mitchell	"8" Well No. 6	Unit J
	Grace	Mitchell	"B" Well No. 5	Unit H
1	Grace	Hitchell	"B" Well No. 2	Unit P

(4) That the applicant now seeks authorization to inject a carbon dioxide "slug" into said wells for purposes of enhancing recovery from said project. -2-Case No. 7104 Order No. R-4633-A

(5) That the injection of carbon dioxide is expected to result in the recovery of an additional 70,000 barrels of oil production from the project.

(6) That the operator should take all steps necessary to snaure that the injected water and carbon dioxide enter only the proposed injection interval and are not permitted to escape to other formations or to the surface from injection, production, or plugged and abandoned wells.

(7) That the injection wells or injection pressurization system should be so equipped as to limit injection pressure at the wellhead to no more than 1800 psi, but the Division Director should have authority to increase said pressure limitation, should circumstances warrant.

(8) That the subject application should be approved and the project should continue to be governed by the provisions of Rules 701, 702, and 703 of the Division Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Conoco Inc., is hereby authorized to inject carbon dioxide into the Grayburg-San Andres formation in its Maljamar Mitchell Waterflood Project in the following described wells in Section 5, Township 17 South, Range 32 East, NMPM, Maljamar Pool, Les County, New Mexico:

Grace Mil	tchell "B"	Well No. 2	Unit P
Grace Mi	tchell "B"	Well No. 5	Unit H
		Well No. 6	

(2) That injection into each of said walls shall be through internally coated tubing, set in a packer which shall be located as near as practicable to the casing shoe; that the casingtubing annulus of each injection well shall be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(3) That the operator shall immediately notify the supervieor of the Division's Hobbs district office of the failure of the tubing or packer in any of said injection wells, the leakage of water, carbon dioxide, or oil from or around any producing well, or the leakage of water, carbon dioxide, or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to cormat cuch failure or leakage. -3-Case No. 7104 Order No. R-4633-A

(4) That the injection wells herein authorized and/or the injection pressurization system shall be so equipped as to limit injection pressure at the wellhead to no more than 1800 psi, provided however, the Division Director may authorize a higher surface injection pressure upon satisfactory showing that such pressure will not result in fracturing of the confining strata.

(5) That the applicant shall notify the supervisor of the Division's Hobbs district office of the date and time of the commencement and termination of carbon dioxide injection in order that the Division, at its option, may witness such activities.

(6) That the project shall continue to be governed by provisions of Division Orders Nos. R-4633 and WFX-462 not inconsistent with this order.

(7) That monthly progress reports of the project shall continue to be submitted to the Division in accordance with Rules 704 and 1115 of the Division Rules and Regulations and the operator shall specifically identify parbon dioxide volumes injected on Division Form C-115, Operator's Monthly Report.

(8) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deam necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO **dil CONSERVATION DIVISION** JOE D. RAMEY Director

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STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT OIL CONSERVATION DIVISION

January 16, 1981

BRUCE KING GOVERNOR LARRY KEHOE BECRETARY

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7104

Conoco Inc.

POST OFFICE BOX 2088 STATE LAND OFFICE BUILDING SANTA FE, NEW MEXICO 87501 (505) 827-2434

Mr. Thomas Kellahin Kellahin & Kellahin Attorneys at Law Post Office Box 1769 Santa Fe, New Mexico ORDER NO._______________

Applicant:

Re: CASE NO.

Dear Sir:

Enclosed herewith are two copies of the above-referenced Division order recently entered in the subject case.

Ppurs very truly, JOE D. RAMEY Director

JDR/fd

Copy of order also sent to: Hobbs OCD______ Artesia OCD______ Aztec OCD_____

Other

Pade STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT 1 OIL CONSERVATION DIVISION STATE LAND OFFICE BLDG. 2 SANTA FE, NEW MEXICO 10 December 1980 3 EXAMINER HEARING 4 6 6 IN THE MATTER OF: Application of Conoco, Inc., for the) amendment of Orders Nos. R-4633 and) 7 CASE 7104 WFX-462, Lea County, New Mexico. 8) 9 BEFORE: Richard L. Stamets 10 11 TRANSCRIPT OF HEARING 12 13 APPEARANCES 14 15 Ernest L. Padilla, Esq. 16 Legal Counsel to the Division For the Oil Conservation State Land Office Bldg. Division: 17 Santa Fe, New Mexico 87501 18 19 W. Thomas Kellahin, Esq. KELLAHIN & KELLAHIN For the Applicant: 20 500 Don Gspar Santa Fe, New Mexico 87501 21 22 23 24 25

INDEX LOWELL DECKERT Direct Examination by Mr. Kellahin Cross Examination by Mr. Stamets EXHIBITS Applicant Exhibit One, Map Applicant Exhibit Two, Graph Applicant Exhibit Three, Schematic Applicant Exhibit Four, Schematic Applicant Exhibit Five, Schematic Applicant Exhibit Six, Letter

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3 1 MR. STAMETS: We'll call at this time 2 Case 7104. 3 MR. PADILLA: Application of Conoco, Inc., 4 for amendment of Orders Nos. R-4633 and WFX-462, Lea County, 5 New Mexico. 6 Tom Kellahin of Santa Fe, MR. KELLAHIN: 7 New Mexico, appearing on behalf of the applicant, and I have 8 one witness. 9 10 (Witness sworn.) 11 12 LOWELL DECKERT 13 being called as a witness and being duly sworn upon his oath, 14 testified as follows, to-wit: 15 16 DIRECT EXAMINATION 17 BY MR. KELLAHIN: 18 Mr. Deckert, would you please state your Q. 19 name and occupation? 20 Lowell Deckert. I'm a Senior Staff En-A. 21 gineer with Conoco, Incorporated. 22 Mr. Deckert, have you previously testi-Q. 23 fied before the Division and had your qualifications as a 24 petroleum engineer accepted and made a matter of record? 25

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 Ω And pursuant to this application have you made a study of the facts surrounding this application? A. Yes.

Yes, I have.

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MR. KELLAHIN: We tender Mr. Deckert as an expert petroleum engineer.

MR. STAMETS: He is considered qualified. O. Mr. Deckert, would you turn to what we've marked as Exhibit Number One and identify that exhibit for us and explain what Conoco is seeking to accomplish?

A. Exhibit One is a map showing Conoco's Grace-Mitchell "B" waterflood. The portion of the lease that's now being waterflooded is outlined in red. This waterflood is being conducted by authority of Order No. R-4633, that's dated September 26, 1973, and WFX Order No. 462, dated June 13th, 1978.

You will note that the injection wells,
Nos. 2, 5, and 6, are designated by red triangles on this
map, and the producing wells, Nos. 3, 4, and 7, are designated
by green circles on this map.

22 0. When the Division originally approved
23 the waterflood project back in September of '73, what were
24 the original two injection wells?

A. The original two injection wells were

1 5 2 Nos. 2 and 6. 3 And subsequently injection well No. 5 Q, 4 was added by administrative order? 5 Yes. A. 6 All right. What are you seeking to ac-O. 7 complish by this application, Mr. Deckert? 8 Conoco wishes to amend Order No. R-4633 A. 9 covering this Grace-Mitchell "B" waterflood to allow us to 10 inject a CO₂ slug. 11 MR. KELLAHIN: If the Examiner please, 12 I'll give you a copy of Order 4633 for your information. 13 0 Is the proposed substitution of CO2 for 14 the injection water the only change that you anticipate making 15 for this waterflood project? 16 Yes, it is. Δ. 17 And that change is the only one you re-Q. 18 quest in Order 4633? 19 Â. Yes. 20 All right, sir, would you turn to Exhibit Q, 21 Number Two and identify that? 22 Exhibit Two is a graph showing the re-À. 23 sults of recent pressure parting tests that we have conducted 24 on the three waterflood injectors. This testing showed that 25 the surface parting pressure ranged from 1850 to 2200 pounds

6 and this is, I might say, equivalent to a surface gradient of .46 to .55 psi per foot of depth. This is a step rate test used, or com-0. piled as a result of the injection of water? 5 Yes, yes, it is. All right. The maximum injection pres-Ά. 6 sure at the surface that would preclude you from fracturing 7 the confining strata would be what pressure, Mr. Deckert? 8 Okay, I would refer to the Caprock test 9 that we recently conducted in the MCA Unit 2-1/2 miles south, 10 and this testing showed that the surface pressure would have 11 to exceed 2300 psi to initiate fractures in the confining 12 13 strata. What was that number again? 14 Q. 15 2300 pounds. A. And that's a surface pressure? 16 Q. Surface pressure, right. 17 All right. You're making reference to A. 18 Q. the carbon dioxide injection project by Conoco? 19 20 Yes. That was the subject of a hearing in Α. 21 Q. 22 Case 6580 and resulted in Order R-6157? 23 Yes, I and. MR. KELLAHIN: If the Examiner please, Α. 24 25

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7 1 we'd like you to take administrative notice of the injection 2 pressures and the fracture information contained in that case, 3 and I have the Commission file here for you. 4 MR. STAMETS: Okay, we will make note of 5 that. 6 Now tell me something about the use of 7 Q. CO2 as an injection medium for this flood project, Mr. Deckert. 8 First of all, is -- I assume the CO2 is injected in a liquid 9 10 state? Yes, it will be. For our present esti-11 mates, we expect to recover about 90,000 barrels of oil from 12 the three producing wells during the remaining five-year 13 waterflood life. By using a CO2 miscible process we estimate 14 that we would be able to recover an additional 70,000 barrels 15 of oil due to the action of the CO2. Our plans call for 16 17 ceasing water injection and following immediately with the injection of a 35,000 ton CO2 slug, and this would represent 18 19 a 15 percent pore volume slug. We would -- we estimate it 20 would require some nine to ten months to inject this CO2 volume, after which time we would return to the injection of 21 22 water. MR. STAMETS: Did you say 15 percent? 23 24 Yes. A. 25 MR. STAMETS: Thank you.

8 1 What injection pressures do you intend 2 3 to use, Mr. Deckert? We expect to inject CO2 at a maximum of A. 4 1850 pounds surface pressure. 5 Would you equate for us the pressure cal-Q. 6 7 culations between those used for CO_2 and those used for the injection of water? In other words, the volumes of CO_2 to be 8 injected are given to us in terms of tons. 9 Okay. 10 Ă. Can you translate that into barrels of 11 Q. liquid and whatnot? 12 The -- we estimate that we would Okay. 13 be able to inject 125 tons a day, and this would equate to 14 a volume of about 700 barrels of liquid per day. 15 Of CO2? 16 17 Yes. À. 18 All right. Now on a daily basis how --Q. 19 what's your water volume? 20 Current water injection volume is 900 Ă. 21 barrels a day in the three injectors. 22 Total for all three wells? 23 A. Yes. 24 At the rate of 700 barrels of Okay. Q, 25 liquid CO2 a day, what would be the surface pressure range

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ġ 1 for the injection of that quantity of CO2? 2 Okay, we would inject at a maximum of 3 A. 1850 pounds and I might say that the density or specific gravity 4 of liquid CO2 is very close to that of water. It's 1.05, as 5 a matter of fact. 6 2 Do you have a minimum injection pressure 7 that you're going to need in order to effectively inject the 8 9 CO₂ into the formation? Yes, I would say that we would need a 10 Å. 11 minimum of 16-to-1700 pounds surface pressure. 12 And in your opinion so long as the sur-Q. face pressure remains below 2300 psi we would not fracture 13 14 the confining strata? 15 Yes. A. 16 All right. The injected formation is 0. 17 the San Andres formation? 18 λ. Yes. 19 0. Would you turn to Exhibit Number Three 20 and identify that for us? 21 Exhibit Three is a downhole schematic of A. the No. 2 injection well, showing the casing and tubing and 22 23 packer configuration for this well. And Exhibit Number Four? 24 Q. 25 Okay, similarly, Exhibit Four is a down-A.

10 1 hole schematic for the injection well No. 5. 2 Okay, and Exhibit Number Five. 3 Exhibit Five is a downhole schematic for 4 injection well No. 6. 5 Q. . Now the three schematics, Exhibits Three, 6 Four, and Five represent how the injection wells are currently 7 completed for the injection of water? 8 That's right. 9 Are there any changes needed or required Q, 10 to inject the CO₂? 11 We anticipate none. 12 Okay. Would you refer to Exhibit Number 0, 13 Six and identify that? 14 A Okay. Exhibit Six is a letter of approval 15 from the USGS to inject CO_2 on the Grace-Mitchell lease, sub-16 ject to approval by the NMOCD. 17 When do you anticipate, Mr. Deckert, that 18 you'll be ready to inject CO2 into this project? 19 As soon after the first of the year as A. 20 we can; the first of the year '81. 21 Were Exhibits One through Six prepared by 22 you or compiled under your direction and supervision? 23 Yes, they were. A. 24 And in your opinion, Mr. Deckert, will Q. 25

11 1 approval of this application be in the best interests of 2 conservation, prevention of waste, and the protection of cor-3 relative rights? 4 Yes, it would. 5 A. MR. KELLAHIN: That concludes our examin-6 We move the introduction of Exhibits One through Six. 7 ation. MR. STAMETS: These exhibits will be 8 admitted. 9 10 CROSS EXAMINATION 11 BY MR. STAMETS: 12 Mr. Deckert, now you indicated you would 13 Q. need at least 1600 to 1700 surface pressure during the in-14 jection of the CO2? 15 Yes. 16 ۸. Okay, and then I believe one of the ex-17 0. hibits showed the lowest frac pressure that you experienced 18 19 was 1850 pounds. That's right. 20 A. And under those -- under those conditions 21 Q, would an 1800 pound pressure limitation be adequate for your 22 operation of the CO2 project? 23 I believe so, yes. 24 A. Okay. What sort of a recovery efficiency 25 Q.

have you experience A.	e on this project as a waterflood?	
A .		
	The indicated ultimate waterflood reco	ve:
looks like it will	be equal to primary recovery, which amou	nto
to 260,000 barrels.		
Q	What is that as a percentage of oil in	
place?		
A	The original oil in place? Primary an	đ
secondary will prob	ably be 40 to 50 percent of the original	
oil in place.		
Q	Has Continental given any consideratio	n
to infill drilling	in the project?	
$\mathbf{A}_{\mathbf{r}}$	Only in a we really haven't run out	
any economics but w	e have looked at them in a sort of cur-	
sory fashion.		
۵	Have you what's the status of the	
pilot project in Ma	ljamar area?	
	Okay, we're currently drilling the fou	r
producing wells in	that pilot. You remember there was a	
central injector, w	hich we drilled and we tested, and so th	9
phase that we're on	right now is drilling the four producing	3
wells.		
r	CO2 injection has not begun in that are	ea
	No. We probably won't be ready to in-	
	place? A. secondary will prob oil in place. Q to infill drilling A. any economics but w sory fashion. Q pilot project in Ma A. producing wells in central injector, w phase that we're on wells. Q A.	A. The original oil in place? Primary and secondary will probably be 40 to 50 percent of the original oil in place. Q. Has Continental given any consideration to infill drilling in the project? A. Only in a we really haven't run out any economics but we have looked at them in a sort of cursory fashion. Q. Have you what's the status of the pilot project in Maljamar area? A. Okay, we're currently drilling the four producing wells in that pilot. You remember there was a central injector, which we drilled and we tested, and so the phase that we're on right now is drilling the four producing wells. Q. CO2 injection has not begun in that area

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1 13 2 Okay, so in effect this will be your Q. 3 pilot project. A. We'd precede -- yes, we'd actually pre-4 cede the pilot. 5 6 The applications for injection wells Q. 7 since 1977 have required a submittal of the records of nearby 8 wells, plugging reports, and whatnot; the idea of that being 9 to prevent leakage of the injected fluid through those wells 10 into zones that we don't want to get fluids into. This is 11 an older project, obviously, and we probably don't have this 12 information available to us. Are you aware of any problems 13 on your own wells or other wells in the area indicating that 14 there is any movement of fluid out of this zone? 15 No, there's -- I'm not aware of any A. problems at all, either in the form of surface flows or down-16 17 hole flows. 18 The Division has been conducting exten-Q. 19 sive surveys in the last 3 - 4 years. I would presume this 20 area has been surveyed by Division personnel. The -- that would be the Bradenhead 21 A. 22 surveys? 23 Right. Q. I believe that's correct on this lease. 24 A. 25 So if there had been any problem, we Q.

probably would have known about it and it would be a part of the records of the Division.

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Q. Okay. We'll examine those subsequent to the hearing and see if our records indicate there are any problems in the area.

Yes.

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Okay, you've asked for a minimum of two orders and it's basically to change the injected fluid from water to CO₂, followed by a waterflood.

That's right.

 \emptyset Okay. One thing that will need to be done in the way of reporting the current reports on Form C-115, would be in barrels of water, and we would need to note on Form C-115 when the CO₂ slug was injected and that should be clearly marked maybe with a red pen or something during the CO₂ injection phase.

CO2 injection phase. Okay.

Q. So that we can properly account for that

in the record.

MR. STAMETS: Any other questions of

23 | this witness?

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Mr. Sexton, I see you back there and you're our District Supervisor in HObbs. Are you aware of

Okay.

any problems which have been experienced with water flows or any other problems related to injection in this area? MR. SEXTON: No, not offhand. I'm sure we have reviewed (inaudible.) MR. STAMETS: Any other questions of this witness? He may be excused. Anything further in this case? The case will be taken under advisement. (Hearing concluded.)

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CERTIFICATE I, SALLY W. BOYD, C.S.R., DO HEREPY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability. Sally W. Boyd C.S.E. I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 7/07. heard by hie on 12.70 19.85 17.80. D, Examiner llum , d Oll Conservation Division

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1 STATE OF NEW MEXICO ENERGY AND MINERALS DEPARTMENT 2 OIL CONSERVATION DIVISION STATE LAND OFFICE BLDG. SANTA FE, NEW MEXICO 3 10 December 1980 4 EXAMINER HEARING 5 6 IN THE MATTER OF: 7 Application of Conoco, Inc., for the) amendment of Orders Nos. R-4633 and) 8 CASE WFX-462, Lea County, New Mexico. 7104 9 10 BEFORE: Richard L, Stamets 11 12 TRANSCRIPT OF HEARING 13 14 성격을 하는 APPEARANCES 15 16 For the Oil Conservation Ernest L. Padilla, Esq. 17 Division: Legal Counsel to the Division State Land Office Bldg. 18 Santa Fe, New Mexico 87501 19 20 For the Applicant: W. Thomas Kellahin, Esq. KELLAHIN & KELLAHIN 21 500 Don Gspar Santa Fe, New Mexico 87501

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LOWELL DECKERT

Direct Examination by Mr. Kellahin

Cross Examination by Mr. Stamets

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Applicant Ex	khibit	Four, Schematic 9
	y .	Five, Schematic 1.0
Applicant Ex	chibit	Six, Letter 10

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4 1 Yes, 'I have. A. 2 And pursuant to this application have Q. 3 you made a study of the facts surrounding this application? 4 Yes. A: 5 MR. KELLAHIN: We tender Mr. Deckert as 6 an expert petroleum engineer. 7 MR. STAMETS: He is considered qualified, 8 Mr. Deckert, would you turn to what we've 9 Ô. marked as Exhibit Number One and identify that exhibit for us 10 and explain what Conoco is seeking to accomplish? 11 Exhibit One is a map showing Conoco's Ά. 12 Grace-Mitchell "B" waterflood. The portion of the lease 13 that's now being waterflooded is outlined in red. This water-14 flood is being conducted by authority of Order No. R-4633, 15 that's dated September 26, 1973, and WFX Order No. 462, dated 16 June 13th, 1978. 17 You will note that the injection wells, 18 Nos. 2, 5, and 6, are designated by red triangles on this 19 map, and the producing wells, Nos. 3, 4, and 7, are designated 20 by green circles on this map. 21 When the Division originally approved 22 the waterflood project back in September of '73, what were 23 the original two injection wells? 24 The original two injection wells were 25

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9	the confin:	ing strata	would be what pressure, Mr. Deckert?
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11	that we req	contly con	ducted in the MCA Unit 2-1/2 miles south,
12	and this to	esting sho	wed that the surface pressure would have
13	to exceed 2	2300 psi t	o initiate fractures in the confining
14	strata.		
15		8	What was that number again?
16		λ.	2300 pounds.
17		Q.	And that's a surface pressure?
18		A.	Surface pressure, right.
19	ji j	Q	All right. You're making reference to
20	the carbon	dioxide i	njection project by Conoco?
21		A.	Yes.
22		Ω ¹⁶ (1) (1) (1) (1) (1) (1) (1) (1) (1) (1)	That was the subject of a hearing in
23	Case 6580 a	nd result	ed in Order R-6157?
24		λ.	Yes, I am.
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MR. STAMPTS: Okay, we will make note of that.

Now tell me something about the use of CO2 as an injection medium for this flood project, Mr. Deckert. First of all, is --- I assume the CO2 is injected in a liquid state?

11 Yes, it will be. For our present esti-12 mates, we expect to recover about 90,000 barrels of oil from the three producing wells during the remaining five-year 13 14 waterflood life. By using a CO2 miscible process we estimate 15 that we would be able to recover an additional 70,000 barrels 16 of oil due to the action of the CO, Our plans call for 17 ceasing water injection and following immediately with the injection of a 35,000 ton CO2 slug, and this would represent a 15 percent pore volume slug. We would --- we estimate it would require some nine to ten months to inject this CO2 volume, after which time we would return to the injection of water.

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MR. STAMETS: Thank you.

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9 1 2 for the injection of that quantity of CO2? 3 Okay, we would inject at a maximum of Δ. 1850 pounds and I might say that the density or specific gravity 4 5 of liquid CO2 is very close to that of water. It's 1.05, as a matter of fact. 6 7 Do you have a minimum injection pressure 0. that you're going to need in order to effectively inject the 8 9 CO_2 into the formation? 10 Yes, I would say that we would need a 11 minimum of 16-to-1700 pounds surface pressure. 12 And in your opinion so long as the sur-13 face pressure nemains below 2300 psi we would not fracture 14 the confining strata? 15 Yes. 16 All right. The injected formation is Q 17 the San Andres formation? 18 Yes. 19 Would you turn to Exhibit Number Three 0 20 and identify that for us? 21 Exhibit Three is a downhole schematic of 22 the No. 2 injection well, showing the casing and tubing and 23 packer configuration for this well. 24 And Exhibit Number Four? 25 Okay, similarly, Exhibit Four is a downλ.

10 1 hole schematic for the injection well No. 5. 2 Okay, and Exhibit Number Five. 3 Exhibit Five is a downhole schematic for Δ injection well No. 6. 5 Now the three schematics, Exhibits Three, Q. . 6 Four, and Five represent how the injection wells are currently 7 completed for the injection of water? 8 That's right. À. 9 Are there any changes needed or required Q, 10 to inject the CO2? 11 We anticipate none. A. 12 Okay. Would you refer to Exhibit Number Q. 13 Six and identify that? 14 Oka,. Exhibit Six is a letter of approval 15 from the USGS to inject CO, on the Grace-Mitchell lease, sub-16 ject to approval by the NMOCD. 17 When do you anticipate, Mr. Deckert, that 18 you'll be ready to inject CO2 into this project? 19 As soon after the first of the year as A. 20 we can; the first of the year '81. 21 Were Exhibits One through Six prepared by 22 you or compiled under your direction and supervision? 23 Yes, they were. A. And in your opinion, Mr. Deckert, will Q.

11 1 2 approval of this application be in the best interests of 3 conservation, prevention of waste, and the protection of cor-4 relative rights? 5 Yes, it would. Λ. 6 MR. XELLAHIN: That concludes our examin-7 ation. We move the introduction of Exhibits One through Six. 8 MR. STAMETS: These exhibits will be 9 admitted. 10 11 CROSS EXAMINATION 12 BY MR. STAMETS: 13 Mr. Deckert, now you indicated you would Q. 14 need at least 1600 to 1700 surface pressure during the in-15 jection of the COn? 16 Yes. ٨, 17 Okay, and then I believe one of the ex-0. 18 hibits showed the lowest frac pressure that you experienced 19 was 1850 pounds. 20 That's right. Λ. 21 0. And under those -- under those conditions 22 would an 1800 pound pressure limitation be adequate for your 23 operation of the CO_2 project? 24 I believe so, yes. λ. 25 Q. Okay. What sort of a recovery efficiency

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12 1 2 have you experience on this project as a waterflood? The indicated ultimate waterflood recovery 3 λ. looks like it will be equal to primary recovery, which amounted 4 to 260,000 barrels. 5 6 What is that as a percentage of oil in 7 place? The original oil in place? Primary and 8 secondary will probably be 40 to 50 percent of the original 9 10 oil in place. Has Continental given any consideration 11 0 12 to infill drilling in the project? 13 Only in a -- we really haven't run out 14 any economics but we have looked at them in a sort of cur-15 sory fashion. 16 Have you -- what's the status of the 0 17 pilot project in Maljamar area? Okay, we're currently drilling the four 18 λ. producing wells in that pilot. You remember there was a 19 central injector, which we drilled and we tested, and so the 20 phase that we're on right now is drilling the four producing 21 22 wells. CO2 injection has not begun in that area. 23 Q. We probably won't be ready to in-24 No. A. 25 ject CO2 down there for another 6 to 9 months.

	1	13
\sim	2	Q. Okay, so in effect this will be your
	3	pilot project.
	4	A. We'd precede yes, we'd actually pre-
	5	cede the pilot.
	6	Q. The applications for injection wells
	7	since 1977 have required a submittal of the records of nearby
	8	wells, plugging reports, and whatnot; the idea of that being
	9	to prevent leakage of the injected fluid through those wells
	10	into zones that we don't want to get fluids into. This is
	11	an older project, obviously, and we probably don't have this
	12	information available to us. Are you aware of any problems
	13	on your own wells or other wells in the area indicating that
	14	there is any movement of fjuid out of this zone?
ð	15	A. No, there's I'm not aware of any
	16	problems at all, either in the form of surface flows or down-
	17	hole flows.
and an and a second	18	Q The Division has been conducting exten-
	19	sive surveys in the last 3 - 4 years. I would presume this
	20	area has been surveyed by Division personnel.
	21	A. The that would be the Bradenhead
	22	surveys?
	23	Q Pight.
	24	A. I believe that's correct on this lease.
	25	Q. So if there had been any problem, we

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1	14
2	probably would have known about it and it would be a part of
3	the records of the Division.
4	A. Yes.
5	Q. Okay. We'll examine those subsequent
6	to the hearing and see if our records indicate there are any
7	problems in the area.
8	Okay, you've asked for a minimum of two
9	orders and it's basically to change the injected fluid from
10	water to CO ₂ , followed by a waterflood.
11	A. That's right.
12	Q. Okay. One thing that will need to be
13	done in the way of reporting the current reports on Form
14	C-115, would be in barrels of water, and we would need to note
. 15	on Form C-115 when the CO2 slug was injected and that should
16	be clearly marked maybe with a red pen or something during
17	the CO ₂ injection phase.
18	A. CO ₂ injection phase. Okay.
19	Q. So that we can properly account for that
20	in the record.
1) 21	A. Okay.
22	MR. STAMETS: Any other questions of
23	this witness?
24	Mr. Sexton, I see you back there and
25	you're our District Supervisor in HObbs. Are you aware of
any problems which have been experienced with water flows or any other problems related to injection in this area? MR. SEXTON: No, not offhand. I'm sure we have reviewed (inaudible.) MR. STAMETS: Any other questions of this witness? He may be excused. Anything further in this case? The case will be taken under advisement. (Hearing concluded.)

CERTIFICATE I, SALLY W. BOYD, C.S.R., DO HEREPY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability. Sally W. Bayd C.S.E. I do hereby certify that the foregoing is a complete reford of the proceedings in the Examiner hearing of Costa No._____, heard by me on______19,____ , Examiner Oll Conservation Division

Page

BEFORE THE OIL CONSERVATION COMMISSION OF THE STATE OF NEW MEXICO

IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION COMMISSION OF NEW MEXICO FOR THE PURPOSE OF CONSIDERING:

> CASE NO. 5062 Order No. R-4633

APPLICATION OF CONTINENTAL OIL COMPANY FOR A WATERFLOOD PROJECT, LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

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This cause came on for hearing at 9 a.m. on September 5, 1973, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this <u>26th</u> day of September, 1973, the Commission, a quorum being present, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

FINDS:

(1) That due public notice having been given as required by law, the Commission has jurisdiction of this cause and the subject matter thereof.

(2) That the applicant, Continental Oil Company, seeks authority to institute a waterflood project on its Mitchell Lease, Maljamar Pool, by the injection of water into the Grayburg-San. Andres formation through two injection wells in Section 5, Township 17 South, Range 32 East, NMPM, Lea County, New Mexico.

(3) That the wells in the project area are in an advanced state of depletion and should properly be classified as "stripper" wells.

(4) That the proposed waterflood project should result in the recovery of otherwise unrecoverable oil, thereby preventing waste.

(5) That the operator should take all steps necessary to ensure that the injected water enters only the proposed injection interval and is not permitted to escape to other formations or onto the surface from injection, production, or plugged and abandoned wells. -2-Case No. 5062 Order No. R-4633

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(6) That the subject application should be approved and the project should be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

IT IS THEREFORE ORDERED:

(1) That the applicant, Continental Oil Company, is hereby authorized to institute a waterflood project on its Mitchell Lease, Maljamar Pool, by the injection of water into the Grayburg-San Andres formation in the open-hole interval in the followingdescribed wells in Township 17 South, Range 32 East, NMPM, Lea County, New Mexico:

Mitchell Well No. 2	Unit P	Section 5
Mitchell Well No. 6	Unit J	Section 5

(2) That the subject waterflood project is hereby designated the Continental Maljamar Mitchell Waterflood Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(3) That injection into each of the aforesaid two wells shall be through internally cement-inged tubing set in a packer as close as is practicable to the casing shoe, and the casingtubing annulus shall be loaded with an inert fluid and equipped with a pressure gauge or other leak-sensing device in order to detect any leakage in the tubing, casing, or packer.

(4) That the operator shall immediately notify the supervisor of the Commission's Hobbs district office of the failure of the casing, tubing, or packer in any of said injection wells, the leakage of water or oil from around any producing well, or the leakage of water or oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(5) That monthly progress reports of the waterflood project herein authorized shall be submitted to the Commission in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

(6) That jurisdiction of this cause is retained for the entry of such further orders as the Commission may deem necessary.

-3-Case No. 5062 Order No. R-4633

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-4 DONE at Santa Fe, New Mexico, on the day and year herein-above designated.

STATE OF NEW MEXICO OIL CONSERVATION COMMISSION

TRUJILLO, Chairman 1. R. PMIJO APAIJO Member ALEX J/ 20 A. L. PORTER, Jr., Member & Secretary

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CONOCO INC.

EXHIBIT #1

GRACE MITCHELL "B" LEASE

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ſ	BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION
	EXHIBIT NO CASE NO7104
	Submitted by Conloco Inc. Hearing Date 12-10-80
	Hearing Date

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EXHIBIT #3 GRACE MITCHELL "B" LEASE WELL NO. 2 660' FSL & 660' FEL SEC. 5-17-32 LEA COUNTY, NEW MEXICO ELEV: 4098' DF 8 5/8" @ 883 W/325 SX TOC @ 2100' 9.9 CORROSION INHIBITED FLUID CEMENT LINED TUBING W/PACKER SET AT 3975' 4 1/2" @ 4025 W/250 SX PBD 4110' T. D. 5650'

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	EXAMINER S	STAMETS DIVISION
CASENIO	HIBIT NO 7104	
Submitted by Hearing Date	<u>LONOCO</u> 12-10	-80

EXHIBIT #4 GRACE MITCHELL "B" LEASE WELL NO. 5 1980' FNL & 660' FEL SEC. 5-17-32 LEA COUNTY, NEW MEXICO ELEV. 4131' DF 7 5/8" @ 1007' W/475 SX TOC @ 2400' 0.4 0.0. CORROSION INHIBITED FLUID PLASTIC COATED TUBING W/PACKER SET AT 3761' 4 1/2" @ 3880' W/225 SX 13 т. р. 4132' BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION 4 EXHIBIT NO ._ 7104 CASE NO. Submitted by CONOCO INC. Hearing Date 12-10-80

EXHIBIT #5 (GRACE MITCHELL "B" LEASE WELL NO. 6 1980' FSL & EL SEC. 5-17-32 LEA COUNTY, NEW MEXICO ELEV. 4103' DF . 7 5/8" @ 950 W/475 SX Æ - . . . TOC BY TEMP. SURVEY @ 1900' 9.9 CORROSION INHIBITED FLUID ¢ CEMENT LINED TUBING WITH PACKER SET AT 3868' 4 1/2" @ 3927' WITH 225 SX CEMENT. T. D. 4085' 41

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BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION	
EXHIBIT NO. 5	
Submitted by CONOCO INC. Hearing Date 12-10-80	

conoco

Conoco Inc.

P.O. Box 460 1001 North Turner Hobbs, NM 88240

(505) 393-4141

US

GEOLOGICAL SURVEY ROSWELL, NEW MEXICO

EXHIBIT #6

L. P. Thompson Division Manager

John R. Kemp Assistant Division Manager Production Department

Hobbs Division North American Production

November 21, 1980

United States Department of the Interior Geological Survey Drawer 1857 88201 Roswell, New Mexico

Attention: Mr. Jerry Long

Gentlemen:

Co₂ Injection - Grace Mitchell "B" Lease - Section 5, T-17S, R-32E, Lea County, New Mexico Re:

Your approval is respectfully requested for Conoco Inc. to convert our Grace Mitchell "B" Lease from water injection to carbon dioxide injection. We wish to place this matter on the NMOCD Examiner Docket of December 10, 1980. No changes other than the type of agent to be injected are planned. It is expected that CO, will be injected for a period of about 10 months beginning in January 1981, after which time water injection will be resumed. We feel that recovery of oil which would not otherwise be recovered can be accomplished by this conversion.

If you have no objection to this proposal, please sign below and return one copy of this letter to us at your earliest convenience. A selfaddressed envelope is enclosed for your convenience. Should you have any questions, we would appreciate your calling Hugh Ingram in this office.

Yours very truly, BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION Approved **EXHIBIT NO.** HAI:dll CASE NO. ANOCO Submitted by_ 12-10-80 Hearing Date_ JPERVISOR TO APPROVAL BY NMOCD SUBJECT Approved: United States Geological Survey

CONOCO INC.

EXHIBIT #1

		CONOCO INC.		EXHIBIT #1
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BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION EXHIBIT NO.__ CASE NO .. Submitted by CONOCO INC. 12-10-80 Hearing Date_

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EXHIBIT #3 GRACE MITCHELL "B" LEASE WELL NO. 2 660' FSL & 660' FEL SEC. 5-17-32 LEA COUNTY, NEW MEXICO ELEV. 4098' DF 8 5/8" @ 883 W/325 SX . 81 TOC @ 2100' 79.9 - CORROSION INHIBITED FLUID CEMENT LINED TUBING W/PACKER SET AT 3975' 4 1/2" @ 4025 W/250 SX PBD 4110' T. D. 5650' BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION EXHIBIT NO 04 CASE NO. Submitted by_ ONOCO INC. C 12-10-80 Hearing Date_

GRACE MITCHELL "B" LEASE EXHIBIT #4 WELL NO. 5 1980' FNL & 660' FEL SEC. 5-17-32 LEA COUNTY, NEW MEXICO FLEV. 4131' DF 7 5/8" @ 1007' W/475 SX TOC @ 2400' 0.4 - CORROSION INHIBITED FLUID PLASTIC COATED TUBING W/PACKER SET AT 3761' 4 1/2" @ 3880' W/225 SX . . . T. D. 4132! BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION FXHIBIT NO CASE NO .. 04 Submitted by CONOCO INC. Hearing Date 12-10-80

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EXHIBIT #5 (GRACE MITCHELL "B" LEASE WELL NO. 6 1980' FSL & EL SEC. 5-17-32 LEA COUNTY, NEW MEXICO ELEV. 4103' DF 7 5/8" @ 950 W/475 SX -----TOC BY TEMP. SURVEY @ 1900' 9.9 CORROSION INHIBITED FLUID Ś CEMENT LINED TUBING WITH PACKER SET AT 3868' 4 1/2" @ 3927' WITH 225 SX CEMENT. يند ۽ ا مع T. D. 4085' BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION EXHIBIT NO. CASE NO. 7104 Submitted by Canaco INC. Hearing Date 12-10-80

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Conoco Inc.

P.O. Box 460 1001 North Turner

Hobbs, NM 88240

(505) 393-4141

EXHIBIT #6

GEOLOGICAL SURVEY

ROSWELL, NEW MEXICO

L. P. Thompson Division Manager

John R. Kemp Assistant Division Manager

Production Department Hobbs Division North American Production

November 21, 1980

United States Department of the Interior Geological Survey Drawer 1857 Roswell, New Mexico 88201

DEVOTOR

Attention: Mr. Jerry Long

Gentlemen:

Re: Co, Injection - Grace Mitchell "B" Lease - Section 5, T-17S, R-32E, Lea County, New Mexico

Your approval is respectfully requested for Conoco Inc. to convert our Grace Mitchell "B" Lease from water injection to carbon dioxide injection. We wish to place this matter on the NMOCD Examiner Docket of December 10, 1980. No changes other than the type of agent to be injected are planned. It is expected that CO, will be injected for a period of about 10 months beginning in January 1981, after which time water injection will be resumed. We feel that recovery of oil which would not otherwise be recovered can be accomplished by this conversion.

If you have no objection to this proposal, please sign below and return one copy of this letter to us at your earliest convenience. A selfaddressed envelope is enclosed for your convenience. Should you have any questions, we would appreciate your calling Hugh Ingram in this office.

Yours very truly, **BEFORE EXAMINER STAMETS** OIL CONSERVATION DIVISION APPROVED 0 EXHIBIT NO HAI:dll CASE NO. DEC 31/350 1000 Submitted by NC 2 -10-Hearing Date___ SUPERVISOR TO APPROVAL BY NMOCD Approved United States Geological Survey

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CONOCO INC. GRACE MITCHELL. "B" LEASE

BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION EXHIBIT NO. CASE NO .. Submitted by CONOCO INC. 12-10-80 Hearing Date.

EXHIBIT #1



EXHIBIT #3 GRACE MITCHELL "B" LEASE WELL NO. 2 660' FSL & 660' FEL SEC. 5-17-32 LEA COUNTY, NEW MEXICO ELEV. 4098' DF **.** 8 5/8" @ 883 W/325 SX TOC @ 2100' • 9.9 4 CORROSION INHIBITED FLUID CEMENT LINED TUBING W/PACKER SET AT 3975' 4 1/2" @ 4025 W/250 SX PBD 4110' T. D. 5650' . 11 BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION 3 EXHIBIT NO. 7104 CASE NO ._ Submitted by CONOCO INC. 12-10-80 Hearing Date___

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BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION	
EXHIBIT NO. 4	
Submitted by Canaco Inc.	
Hearing Date 12-10-80	

EXHIBIT #4

The second state and the se	
	EXHIBIT #5
$\left(\right)$	GRACE MITCHELL "B" LEASE
	WELL NO. 6 1980' FSL & EL
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	LEA COUNTY, NEW MEXICO ELEV. 4103' DF
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	BEFORE EXAMINER STAMETS
	OIL CONSERVATION DIVISION
	EXHIBIT NO,
	CASE'NO. 7104

L. P. Thompson Division Manager

John R. Kemp Assistant Division Manager

Production Department Hobbs Division North American Production

November 21, 1980

United States Department of the Interior Geological Survey Drawer 1857 Roswell, New Mexico 88201

VOTOR

Attention: Mr. Jerry Long

Gentlemen:

Re: Co₂ Injection - Grace Mitchell "B" Lease - Section 5, T-17S, R-32E, Lea County, New Mexico

Your approval is respectfully requested for Conoco Inc. to convert our Grace Mitchell "B" Lease from water injection to carbon dioxide injection. We wish to place this matter on the NMOCD Examiner Docket of December 10, 1980. No changes other than the type of agent to be injected are planned. It is expected that CO, will be injected for a period of about 10 months beginning in January 1981, after which time water injection will be resumed. We feel that recovery of oil which would not otherwise be recovered can be accomplished by this conversion.

If you have no objection to this proposal, please sign below and return one copy of this letter to us at your earliest convenience. A selfaddressed envelope is enclosed for your convenience. Should you have any questions, we would appreciate your calling Hugh Ingram in this office.

form	(9 jesnip	BEFORE EXAMINER STAMETS OIL CONSERVATION DIVISION
AI:d11	APPROVED	EXHIBIT NO.
	DEC 3/1920	CASE NO. 7104 Submitted by CONOCO INC.
	DISTRICT SUPERVISOR	Hearing Date 12-10-80



Conoco Inc.

P.O. Box 460

1001 North Turner Hobbs, NM 88240 (505) 393-4141 EXHIBIT #6

S. GEOLOGICAL SURVEY ROSWELL, NEW MEXICO L. P. Thompson Division Manager

John R. Kemp Assistant Division Manager

Production Department Hobbs Division North American Production

November 20, 1980

Oil Conservation Division Department of Energy and Minerals State of New Mexico P.O. Box 2088 Santa Fe, New Mexico 87501

Case 7604

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DEC 0 2 1980

OIL CONSERVATION DIVISION SANTA FE

济入

conoco

Conoco Inc. P.O. Box 460

(505) 393-4141

1001 North Turner Hobbs, NM 89240

Attention: Mr. Dan Nutter

Gentlemen:

Application of Conoco Inc. for Authority to Convert from Water to Carbon Dioxide Injection - Grace Mitchell "B" Lease

Attached in triplicate is Conoco Inc.'s application as shown above. Please schedule this matter on the December 10, 1980 Examiner Docket.

Yours very truly, Ankten,

HAI:d11

SALE REPARTMENT



BEFORE THE OIL CONSERVATION DIVISION OF THE OIL CONSERVATION DIVISION NEW MEXICO DEPARTMENT OF ENERGY AND MINERALS SANTA FE

IN THE MATTER OF THE APPLICATION OF CONOCO INC. FOR AUTHORITY TO CONVERT FROM WATER INJECTION TO CARBON DIOXIDE INJECTION IN ITS MITCHELL WATERFLOOD PROJECT, LOCATED IN SECTION 5, T-17S, R-32E, LEA COUNTY, NEW MEXICO

Case >104

APPLICATION

Applicant, Conoco Inc., respectively requests authority to convert its Grace Mitchell "B" Lease waterflood project located in Section 5, T-17S, R-32E, Lea County, New Mexico, Maljamar Grayburg-San Andres Pool, from water injection to carbon dioxide injection, and in support thereof will show:

1. Applicant is owner and operator of the Grace Mitchell "B" Lease, which in addition to other lands includes the E/2, E/2 NW/4 of Section 5, T-17S, R-32E, Lea County, New Mexico.

2. Applicant was authorized by Order R-4633 to institute a waterflood project by injecting water into the Grayburg-San Andres Formation in Wells No. 2 and 6, located in units P and J, respectively, of said Section 5.

3. Applicant was authorized by Order WFX 462 to inject water into well No. 5, located in Unit H of Section 5.

4. That the injection of carbon dioxide will result in the recovery of oil that would not otherwise be recovered.

5. That the granting of this application will prevent waste and will not impair the correlative rights of any party.

WHEREFORE, applicant respectfully requests that this matter be set for hearing before the Division's duly appointed examiner and, upon hearing, an order be entered authorizing the conversion from water injection to carbon dioxide injection as described above.

Respectfully submitted,

CONOCO INC っんり

John R. Kemp Assistant Division Manager of Production

DEC 0 2 1990 OIL CONSTRUCT DUISION SANTA FE

BEFORE THE OIL CONSERVATION DIVISION OF THE NEW MEXICO DEPARTMENT OF ENERGY AND MINERALS

IN THE MATTER OF THE APPLICATION OF CONOCO INC. FOR AUTHORITY TO CONVERT FROM WATER INJECTION TO CARBON DIOXIDE INJECTION IN ITS MITCHELL WATERFLOOD PROJECT, LOCATED IN SECTION 5, T-17S, R-32E, LEA COUNTY, NEW MEXICO

Case >104

APPLICATION

Applicant, Conoco Inc., respectively requests authority to convert its Grace Mitchell "B" Lease waterflood project located in Section 5, T-17S, R-32E, Lea County, New Mexico, Maljamar Grayburg-San Andres Pool, from water injection to carbon dioxide injection, and in support thereof will show:

1. Applicant is owner and operator of the Grace Mitchell "B" Lease, which in addition to other lands includes the E/2, E/2 NW/4 of Section 5, T-17S, R-32E, Lea County, New Mexico.

2. Applicant was authorized by Order R-4633 to institute a waterflood project by injecting water into the Grayburg-San Andres Formation in Wells No. 2 and 6, located in units P and J, respectively, of said Section 5.

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Respectfully submitted,

CONOCO INC. in KKemp Joon R. Kemp

Assistant Division Manager of Production

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DEC 0 2 1980

BEFORE THE OIL CONSERVATION DIVISION OF COMPANY OF THE SANTA FE

IN THE MATTER OF THE APPLICATION OF CONOCO INC. FOR AUTHORITY TO CONVERT FROM WATER INJECTION TO CARBON DIOXIDE INJECTION IN ITS MITCHELL WATERFLOOD PROJECT, LOCATED IN SECTION 5, T-17S, R-32E, LEA COUNTY, NEW MEXICO

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Case >104

APPLICATION

Applicant, Conoco Inc., respectively requests authority to convert its Grace Mitchell "B" Lease waterflood project located in Section 5, T-17S, R-32E, Lea County, New Mexico, Maljamar Grayburg-San Andres Pool, from water injection to carbon dioxide injection, and in support thereof will show:

1. Applicant is owner and operator of the Grace Mitchell "B" Lease, which in addition to other lands includes the E/2, E/2 NW/4 of Section 5, T-17S, R-32E, Lea County, New Mexico.

2. Applicant was authorized by Order R-4633 to institute a waterflood project by injecting water into the Grayburg-San Andres Formation in Wells No. 2 and 6, located in units P and J, respectively, of said Section 5.

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4. That the injection of carbon dioxide will result in the recovery of oil that would not otherwise be recovered.

5. That the granting of this application will prevent waste and will not impair the correlative rights of any party.

WHEREFORE, applicant respectfully requests that this matter be set for hearing before the Division's duly appointed examiner and, upon hearing, an order be entered authorizing the conversion from water injection to carbon dioxide injection as described above.

Respectfully submitted,

CONOCO_INC

John R. Kemp Assistant Division Manager of Production

Page 2 of 4 Examiner Hearing - Wednesday - December 10, 1980

Docket No. 40-80

CASE 7103: Application of E. L. Latham, Jr. for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Wolfcamp thru Pennsylvanian formations underlying the N/2 of Section 7, Township 22 South, Range 26 East, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.

CASE 7104:

Application of Conoco Inc. for the amendment of Orders Nos. R-4633 and WFX-462, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Division Orders Nos. R-4633 and WFX-462, which authorized the injection of water into applicant's Maljamar Mitchell Waterflood Project in Section 5, Township 17 South, Range 32 East. The amendments sought would include carbon dioxide in the injection authorization for said project.

CASE 7105: Application of C and E Operators, Inc. for compulsory pooling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling, san Juan County, new mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Mesaverde formation underlying the N/2 of Section 9, Township 30 North, Range 11 West, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of dril-ling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.

CASE 7106: Application of C and B Operators, Inc. for compulsory pooling, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Mesaverde formation underlying the S/2 of Section 8, Township 30 North, Range 11 West, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of dril-ling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.

CASE 7107: Application of C and E Operators, Inc. for compulsory pooling and a non-standard proration unit, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Mesaverde formation underlying a 158.54-acre non-standard gas proration unit comprising the SW/4 of Section 9, Township 30 North, Range 11 West, to be dedicated to a well to be drilled at a standard location thereon. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof as well as actual operating costs and charges for supervision, designation of applicant as operator of the well, and a charge for risk involved in drilling said well.

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CASE 7090: (Continued from November 25, 1980, Examiner Hearing)

Application of Dorchester Exploration, Inc. for directional drilling and an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to re-enter the old Union Hill Well No. 1, the surface location of which is 2310 feet from the North and West lines of Section 27, Township 12 South, Range 28 East, and to directionally drill in an indeterminate direction from a kick-off point at 7300 feet, bottoming said well at a. approximate depth of 8100 feet in the Mississippian formation less than 330 feet away from the surface location. The W/2 of said Section 27 would be dedicated to the well.

CASE 6668: (Continued from November 25, 1980, Examiner Hearing)

In the matter of Case 6668 being reopened pursuant to the provisions of Order No. R-6139 which order promulgated temporary special rules and regulations for the South Culebra Bluff-Bone Spring Pool in Eddy County, New Mexico, including a provision for 80-acre spacing units. Operators in said pool may appear and show cause why the pool should not be developed on 40-acre spacing units.

CASE 7092: (Continued from November 25, 1980, Examiner Hearing)

Application of Delta Drilling Company for pool extension, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks the extension of the South Culebra Bluff-Bone Spring Pool to include all of Sections 2, 11, 13, 14, 23, and 24, Township 23 South, Range 28 East.

CASE 7056: (Continued and Readvertised)

Application of Gatty 011 Company for the extension of vertical limits of the Jalmat Pool, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the contraction of the vertical limits of the Langlie-Mattix Pool and the downward extension of the vertical limits of the Jalmat Pool to a denth of 3740 fast, subsurface, under the NW/4 SW/4 of Section 3, Township 24 South, Range 36 East.

Conoco, Que convert from when inj to Con up mitched with fld proj meljamar &-SA 5-175 32 Lea Co. 3 inj wills: 2 by R-4633; 1 by WFX-462 called in by Hugh Ingram 10:30 am 11/20/80 Written application to fallow application of Conoco due for the amentment of Orders nos. R-4633 and WFX-462 Ken County, hew meyees applicant, in the avove styled cause, seeks the amendment of Division Orders Ros. K-4633 and WFX-462, which anthonigh the injection of water ento applicants mitchel maljamar mitched waterflood Project in Section 5, Founding 17 South Kange 32 East. Contract 2003 how winchig amendments and and in the authorization for said Viere project

STATE OF NEW MEXICO DRAFT ENERGY AND MINERALS DEPARTMENT dr/ OIL CONSERVATION DIVISION IN THE MATTER OF THE HEARING CALLED BY THE OIL CONSERVATION DIVISION FOR THE PURPOSE OF CONSIDERING: CASE NO. 7104 Order No. R- 4633-19 APPLICATION OF CONOCO INC. FUR THE AMENDMENT OF ORDERS NOS. R-4633 AND WFX-462, RONXXXWATERRESSEXFROMEER, LEA COUNTY, NEW MEXICO. ORDER OF THE DIVISION BY THE DIVISION: This cause came on for hearing at 9 a.m. on December 10 1980 , at Santa Fe, New Mexico, before Examiner Richard L. Stamets . day of December , 1980 , the Division NOW, on this Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises, FINDS: (1) That due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof. That the applicant, CONOCO INC., seeks the amendment of, (2) Division Orders Nos. R-4633 and WFX-462, which authorized the seeks authority to institute a waterflood project on its injection of water into applicant's Maljamar Mitchell Waterflood Lease, Project (), have County New Marces Bookxxbyxxbexxbaxiageattanxafiwatexxbbxxtbexxxxx

(3) that said orders authorized the injection of water into the Grayburg -Described wells in Nownship 17 South, Range 32 Cast, NM PM, New County, New Marian maxico : Groce M. Filell "B" Well No 2 Unit P n. e. n. .. . •• 5 T ·· 6 Fr (4) that the applicant now seeks to expect said wells a thorizonton to inject a carbon dioxide is lug" finds said wells for purposes of enhancing recovery from soid project. (5) That The injection of carbon diorice as is expected to result in the recovery of an additional TO,000 horrors of in production from the project

ensure that the injected water enter only the proposed injection interval and is not permitted to escape to other formations or sto the surface from injection, production, or plugged and abandoned wells.

(4) That the injection wells or injection pressurization system should be so equipped as to limit injection pressure at the wellhead to no more than <u>1800</u> psi, but the Division Director should have authority to increase said pressure limitation, should circumstances warrant.

(b) That the subject application should be approved and Convinue to
 the project should/be governed by the provisions of Rules 701, 702, and 703 of the Division Rules and Regulations.

IT IS THEREFORE ORDERED:

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That injection into each of said wells shall be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation, that the casing-tubing annulus of each injection well shall be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(*) That the operator shall immediately notify the supervisor of the Division's <u>Hobbs</u> district office of the failure of the tubing or packer in any of said injection wells,

(b) That the operator should take all steps necessary to control of divide the injected water enters only the proposed injection interval and is not permitted to escape to other formations or so to the surface from injection, production, or plugged and abandoned wells.

(4) That the injection wells or injection pressurization system should be so equipped as to limit injection pressure at the wellhead to no more than <u>1800</u> psi, but the Division Director should have authority to increase said pressure limitation, should circumstances warrant.

(b) That the subject application should be approved and Confined for the project should be governed by the provisions of Rules 701, 702, and 703 of the Division Rules and Regulations.

IT IS THEREFORE ORDERED:

a) That the applicant, Conois Inc., is beneby authorized to inject approach. carbon dioxide to inte an the myberg-San The dres forme tors in its Maljomar Mitchell Waterflood Brojcet and in the following described wells is Subion 5, Township 17 South Range 32 Cart, NMPM, Maljamer Paol, her County, New Merico: Grace Mitchell 3" Well No 2 Unit P

> That injection into each of said wells shall be through internally coated tubing, set in a packer which shall be located as near as practicable to the uppermost perforation; that the casing-tubing annulus of each injection well shall be loaded with an inert fluid and equipped with an approved pressure gauge or attention-attracting leak detection device.

(b) That the operator shall immediately notify the supervisor of the Division's <u>Hobbs</u> district office of the failure of the tubing or packer in any of said injection wells,

Carbon dioxide gos the leakage of water for oil from around any producing well, or Carbon dioxide gos the leakage of water for oil from any plugged and abandoned well within the project area and shall take such timely steps as may be necessary or required to correct such failure or leakage.

(4) That the injection wells herein authorized and/or the injection pressurization system shall be so equipped as to limit injection pressure at the wellhead to no more than 1800 psi, provided however, the Division Director may authorize a higher surface injection pressure upon satisfactory showing that such pressure will not result in fracturing of the confining strata.

applicant the da t The meetion Surli The project 5 by provision not in con

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 (a) That monthly progress reports of the waterflood Confinite to project herein authorized shall/be submitted to the Division in accordance with Rules 704 and 1150 of the Division Rules and Regulations.and the operator shall specifically series.
 (a) That jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary. DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

identify carbon dioride que volumes injected on Oivision Form C-115, Operator's Monthly Report.