

Case Number

4852

Application
Transcripts.

Small Exhibits

ETC.

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BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO
November 1, 1972

EXAMINER HEARING

IN THE MATTER OF:

Application of Texaco Inc. for a unit
agreement, Lea County, New Mexico and
application of Texaco Inc. for a pressure
maintenance project and special rules
therefor, Lea County, New Mexico

Case No. 4851
and
Case No. 4852

BEFORE: ELVIS A. UTZ, EXAMINER

TRANSCRIPT OF HEARING

1 MR. UTZ: The Hearing will come to order, please.

2 Case No. 4851 application of Texaco, Inc. for a
3 unit agreement, Lea County, New Mexico.

4 MR. KELLY: William Booker Kelly of White, Gilbert,
5 Koch & Kelly, Santa Fe, on behalf of the applicant.

6 Mr. Examiner, cases 4851 and 4852 are really
7 connected. We would ask that they be consolidated for
8 testimony purposes, but with separate orders.

9 MR. UTZ: Case 4852 is a related matter for
10 pressure maintenance project on the unit agreement, which
11 is covered and 4851, and they will be consolidated for
12 purposes of testimony, with separate orders.

13 KENNETH HARBIN SWORN TO TESTIFY ON HIS OATH AS
14 FOLLOWS:

15 DIRECT EXAMINATION BY MR. KELLY

16 Q Would you state your name, please?

17 A My name is Kenneth Harbin, I am employed by
18 Texaco Incorporated, Midland, Texas.

19 Q And what is your position with Texaco?

20 A Proration engineer.

21 Q Have you previously qualified as an expert
22 witness in that field before this Commission?

23 A I have not.

24 Q Would you give the examiner a brief summary of
25 your professional experience?

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A Yes, I received a Bachelor of Science Degree in Petroleum Engineering at Texas Tech University in 1962. I was employed by Texaco at that time. I have held various engineering positions at West Texas and New Mexico over the past ten years involving reservoir engineering and in the field of operations, and I am presently assigned as proration engineer.

Q Then your experience covers the particular Vacuum pool that we are discussing today?

A Yes sir, it does.

MR. KELLY: Are the witness's qualifications acceptable?

MR. UTZ: Yes, they are.

MR. KELLY: All right, sir. Now, the two applications for oil, 4851 and 4852, have been condolidated.

Q Would you state what Texaco seeks by these applications?

A Texaco is today making application to, first of all, form a 1400-acre unit comprised of all of portions of sections 1,2,11, and 12, Township 18 South, Range 34 East, Lea County, New Mexico, for the purpose of conducting secondary recovery operations in the Vacuum of the Grayburg-San Andres pools.

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Secondly, we request permission to drill eight injection wells, seven producing wells, at unorthodox locations, in order to develop the unit area, and, we further request that a full allowable be granted for each well drilled effective upon completion of that well.

We request approval to initiate a pressure maintenance project in the Vacuum Grayburg-San Andres reservoirs, and we request that Texaco be granted a bonus allowable of 75% above the projected allowable. We request permission to continue the present commingling of separate lease production into a common tank battery for leases both inside and outside of the proposed unit.

And lastly, we request that we be authorized to drill and/or convert additional wells in the proposed unit area without notice of hearing, subject to administrative approval by the Commission.

Q Now, in that connection, are you requesting by this application that the right to drill additional wells be given prior to showing response?

A Yes.

Q Referring to your plat, would you explain the

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1 various codes shown there to the Examiner, Exhibit
2 No. 1?
3 A Exhibit No. 1 shows a portion of the Vacuum
4 Grayburg-San Andres pool, and the other reservoirs
5 overlying, underlying it. The red border outlines
6 the proposed unit area. The symbol indicated by
7 the individual wells, the letter symbols, are
8 explained in the legend on down here and denotes
9 the completion reservoirs of various wells.
10
11 The one of interest is the designation shown as
12 "S" which we've used to denote a Vacuum Grayburg-
13 San Andres completion. Inside the unit area, you
14 will note wells denoted with red circles, these
15 are current Vacuum Grayburg-San Andres producing
16 wells.
17
18 The green circles are locations of proposed
19 producers to be drilled, and the yellow triangles
20 denote proposed injection wells to be drilled.
21
22 O The plat also shows other secondary recovery
23 projects in the area, is that correct?
24
25 A Yes, it does. Adjoining the proposed unit to the
West is Texaco's West Vacuum Grayburg-San Andres
unit, and to the North, beginning approximately
one mile North of the proposed unit, is Mobile's,

1 Bridges State water flood project.

2 Q Now, as far as ownership surrounding that
3 unit, does Texaco own the acreage surrounding it
4 except to the North?

5 A See, there are Phillips that borders the proposed
6 unit to the North, Shell on the Northeast corner,
7 Marathon on the Eastern edge, Humble and Sohio on
8 the Southeast portion and Amoco to the Southwest
9 corner.

10 Q And then Texaco would have the rest?

11 A That's correct.

12 Q Referring to what is marked Exhibit No. 2, would
13 you identify that?

14 A Exhibit 2 is the proposed unit agreement.

15 Q And can you state for the record the actual
16 description, the legal description of the acreage
17 contained in the unit?

18 A The unit will be comprised of all of Sections 1 and
19 2, the Northeast quarter of the Northeast quarter
20 of Section 11, the North half of the Northwest
21 quarter of Section 12, Township 18 South, Range 34
22 East, Lea County, New Mexico.

23 Q And what is the unitized formation?

24 A The unitized formation is the Grayburg-San Andres
25 interval. It's specified in the unit agreement on

1 Article 1.4, page 2.

2 Q And the purpose of this unit is for a secondary

3 recovery project?

4 A That's correct.

5 Q Now, is Texaco the only working interest owner and

6 operator of this unit?

7 A That is correct.

8 Q What is the land involved?

9 A All of the leases here are State owned leases,

10 various beneficiaries.

11 Q Now, referring to Exhibit 3, do you have tentative

12 approval from the State Land Office, subject only

13 to the Commission's action?

14 A That's true. Exhibit 3 is a letter from the

15 office of the Commissioner of Public Lands, indicat-

16 ing that they have approved the unit agreement as

17 to form and content, subject to approval by the

18 Commission.

19 Q Now, I assume this unit is basically similar

20 to other units that have been approved by the

21 Commission?

22 A That is correct.

23 MR. KELLY: Now, after the application in 4852,

24 Mr. Examiner, I would like to point out that the notice

25

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1 contains two small errors which I don't feel are
2 jurisdictional in any sense, but we would like to correct
3 that.

4 it says by the injection of water through eight
5 wells at orthodox and unorthodox locations. Actually, all
6 the locations sought are unorthodox.

7 Further, it says that we seek to drill eight
8 producing wells. The applicant seeks seven producing wells.

9
10 MR. UTZ: I would consider the applications
11 basically correct, since we don't have a lawyer to argue with.

12 MR. KELLY: Well, it's alright.

13 Q Now, referring to Exhibit 4, which is a structure
14 map of the unit, would you give the Examiner the
15 history of this pool?

16 A Yes, Exhibit 4 is, incidentally, only outlines
17 a portion of the Vacuum Grayburg-San Andres pool,
18 but the Vacuum pool was discovered in May 1929,
19 with production being derived from both the lower
20 Grayburg limestone and the San Andres formation.
21 The field is located on a east-southwest
22 trending anti-cline at the end, which is located
23 on the southern edge of the Northwestern platform.
24 The southern flank of the structures dips steeply
25

1 to the hole water contact.

2 In regard to the proposed secondary recovery area,
3 the heterogeneous carbon characteristics will be
4 illustrated by an exhibit to be presented in later
5 testimony. The Vacuum Grayburg-San Andres reservoir
6 within the proposed project area had an initial
7 reservoir pressure of minue 600 feet, 1638 p.s.i.,
8 with a saturation pressure of 1107 p.s.i. The
9 current reservoir pressure is 720 p.s.i. The field
10 is developed on standard 40 acres spacing. As of
11 August 1, 1972, 558 wells were producing from the
12 Vacuum Grayburg-San Andres pool. Depletion
13 varies throughout the field, from partial to
14 advanced stages.

15 During July of 1972 the field produced 454,069
16 barrels of oil and 185,721 barrels of water. The
17 average GOR was 1600 cubic feet per barrel of oil.
18 Cumulative time production to August 1, 1972, was
19 138,914,336 barrels of oil.

20 Q That's for the whole pool?

21 A That's correct.

22 Q Do you have anything for the unit, cumulative
23 production?

24 A Yes, cumulative production from the proposed unit
25

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area to 8/1/72 is 16,433,000 barrels.

Q How about water production. is there much water production there?

A No, I do not have a cumulative water production available, but water production in this proposed unit area has been small.

Q Now, Exhibit No. 5 is pro-well production figures in a unit, is that correct?

A That's correct. Exhibit 5 lists the wells on the proposed unit area, with their current allowable, and the current oil and water testing with the corresponding GOR, gas-oil ratio.

Q And most of these wells are still making their allowable?

A That's correct.

Q Now, as to your plan of operation here, would you, referring back to Exhibit No. 1, show the Examiner what Texaco feels to be the project area?

A Yes, back on Exhibit 1, which is the base map of the area, you will note that inside the unit boundary, we have penciled in a dashed line which connects what we consider to be the outer most wells in the project area.

Q And would you, referring to Exhibit No. 6, explain that to the Examiner?

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1 A Exhibit No. 6 is a listing of the thirteen wells
2 that we propose to drill. The first seven wells
3 listed are the wells that we proposed to drill
4 as producing wells; and we have listed the lease
5 and well number, the actual footage locations, and
6 the Section, Township, and Range, and following
7 that we have listed similar information for the
8 proposed injection wells.

9 Q Now, this is only for the wells that you plan to
10 drill?

11 A That is correct.

12 Q Now, about your designation for the existing wells?

13 A We plan to continue to present well numbering
14 system and designation that we have at this time.

15 Q Are your present producing facilities for the
16 various leases in the unit consolidated at a central
17 point?

18 A Yes, they are. We have a consolidated battery
19 located on our State "S" lease which is in the north-
20 west corner of the unit area. We consolidate
21 production from each of the leases in the unit area
22 as well as other leases outside the unit area. The
23 production is metered, of course, prior to leaving
24 the individual leases, and we plan to, with the
25 Commission's approval, continue this practice of

commingling this production.

Q All right, now, go ahead and explain the plan of the project.

A I think it could best be seen on the Exhibit 1, the base map.

By drilling these proposed injection wells and producing wells, we will develop an inverted 9-spot injection pattern within what we have designated as a project area, and this will, in effect, be developing this acreage on 20 acre spacing as opposed to the current 40 acre spacing.

Q All right. Now, as to your injection procedures, referring to Exhibit 7, is that sketch typical of the installation that you will use for all your injection wells?

A Yes sir. That is correct. Of course, since we plan to drill all of our injection wells, this is the proposed installation. This particular one is what we proposed to install in our New Mexico R State N.C.T. 3, Well No. 20; but it is typical of the similar installations that will be used on the other seven wells.

We plan to drill and complete this well, these eight wells, I should say, using 8 and 5/8 surface casing at approximately 350 feet, cemented

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1 with 210 sacks cement, which should be sufficient.

2 We will then install 4 and 1/2 inch production

3 casing at approximately 4710 feet, cemented, with

4 650 sacks. We estimate the top of the cement to be

5 at 2,000 feet. We will then use 2 and 3/8 inch

6 plastic coated tubing with a packer, the packer

7 being set above the pay interval at approximately

8 4360 feet. We will load the casing tubing

9 annulus with inhibited water. Injection interval

10 will be approximately from 4460 to 4710 feet.

11 This exact interval, of course, could vary

12 between the various wells.

13 Q The figures that you gave would be the range of

14 all the wells, or just this particular well?

15 A That will be the range. I might add, too, that

16 we will install a pressure gauge on the tubing

17 and on the casing annulus.

18 Q Can you give the Examiner what you contemplate as

19 far as injection rates and pressure?

20 A Well, we anticipate an injection rate of about

21 1500 barrels of water per day, per well, at a

22 pressure of 2,000 p.s.i.

23 Q Do you think you will have any problem in

24 injecting that volume with that pressure in this

25 pool?

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1 A No, we do not.

2 Q Do you anticipate any corrosion problems?

3 A No, we will be using fresh water and we are taking

4 care in using inhibited water in the annulus,

5 and plastic coating tubing to prevent corrosion.

6 Q Does Texaco have what they consider an adequate

7 water supply for the project area and for any

8 expansion within the limits of the unit?

9 A Yes, the water rights which we have will be

10 sufficient for the current project area and any

11 expansion up to the unit area.

12 Q In your opinion, will the installation you have

13 shown on Exhibit 7 prevent migration of fluids

14 to any other zone?

15 A Yes, it will.

16 Q Now, let's go to the unorthodox aspect of this

17 period. What is unorthodox about the locations

18 of these wells?

19 A In order to develop the space in which we have

20 outlined, the proposed wells to be drilled

21 will fall at less than 330 feet from the border

22 section rights.

23 Q What is the reason that Texaco plans to drill all

24 these additional wells rather than using your

25 existing pattern for a project?

1 A It's Texaco's opinion that these additional wells
2 are needed to recover additional secondary oil
3 that is not recoverable under present spacing.
4 We've conducted a study of the proposed unit area,
5 which indicates that the pay in the reservoir is
6 laterally discontinuous.

7 Q That's Exhibit No. 8?

8 A That's correct.

9 Q Go ahead and show that to the Examiner.

10 A Exhibit No. 8 is a schematic representation
11 of the pay discontinuity which we have determined
12 from our study, and the results of our study
13 indicates that only about 60% of the actual pay
14 interval is continuous between more than two wells.
15
16 Utilizing the present spacing would result in a
17 portion of this porous interval not being opened
18 to injection, and we anticipate by in-field
19 drilling on the 20 acre spacing, we will reduce
20 the unflooded pay by approximately half. Of
21 course, another benefit which can be derived from
22 the drilling of these injections wells lies
23 in the fact that most of the present wells are
24 open hole completions, and by drilling in the
25 casing through the proposed injection interval

1 and our injection wells, we will be able to
2 complete them in such a way as to control the
3 actual intervals of injection.

4 Q Now, has Texaco's experience with that adjoining
5 waterflood, does that support your conclusion
6 that a more dense pattern would be more effective?

7 A Yes, it does. That West Vacuum unit, which adjoins
8 us here on the west, was initially developed as
9 a double inverted 9-spot pay lot. We initiated
10 this project about 1965, and we did obtain
11 response with that pattern, but the response was
12 slow.

13 We have recently, earlier this year, developed and
14 expanded the injection pattern in the west Vacuum
15 unit to a 5-spot pattern in order to accelerate
16 response, and we feel that by developing this on
17 even denser spacing, we will recover additional
18 reserves, that we could not recover otherwise.

19 Q You mentioned that Texaco's studies support the
20 conclusion that you've shown on Exhibit 8.

21 Referring to Exhibit 9, would you give the
22 Examiner some of the information that supports
23 this conclusion?
24

25 Q Exhibit 9 is an actual log cross section, from which

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1 the schematic diagram on Exhibit 8 was derived.

2 Q Before we get into the discussion of what it
3 shows, let's locate, using your structure map,
4 Exhibit 4 of the wells, that are on your cross
5 section.

6 A I think probably the structure map would be the
7 best, that's Exhibit 4, I believe.

8
9 The cross section begins actually on just
10 outside of the northern boundary of the project
11 area on Texaco's "O" tract one, well number 8. It
12 extends southward down to the second location
13 which is the "M" number 4. It then goes east
14 to the "M" number 1, goes further east to the
15 "L" number 1, on east to "L" number 3, and then
16 north again to "L" number 2.

17 Q Now, the cross section doesn't cover the whole
18 unit. Did Texaco use all of the available logs?

19 A That is correct. In order to develop a cross
20 section, I had the continuous pay, as we've
21 tried to do, we denote porosity logs, we have
22 other logs across the area which are old electric
23 logs, and they are not really satisfactory for our
24 purposes.

25 Q In your opinion, though, is the conclusion shown

1 on Exhibit 8 indication for the whole unit, rather
2 than just the area covered by the cross section?

3 A And it might explain just a little further here,
4 that Exhibit No. 9 here does indicate that the
5 porous intervals are not continuous across the
6 field, they are continuous, maybe, for one, two,
7 or three wells, but as far as being consistently
8 continuous laterally, across the field, the are
9 not.

10 Q Now, do you have any other evidence that you can
11 give the Examiner as far as other studies
12 of this nature in this pool?

13 A Yes, I might refer to a previous case, it was
14 Case No. 4368 in September 17, 1970, which was
15 a De Novo hearing involving Mobile Oil
16 Corporation, and their Bridges State waterflood
17 project for the north.

18 They presented in their testimony Exhibit No. 11,
19 which was a cross section that began just to the
20 North of our proposed unit area, and continued
21 in a northerly line for approximately 4 miles,
22 and their cross section essentially indicates the
23 same type of pay discontinuity that we have
24 represented here on our cross section.
25

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1 Q

All right. What do you predict the performance of this pressure maintenance project will be?

3 A

The project area, I again will refer to Exhibit No. 1, which outlines the project area, will

recover a total of \$14,660,000 barrels full of secondary oil. Of this amount, 2,349,000 barrels are directly attributable to the in-field drilling program.

Current production from the proposed project area is 1650 barrels per day from 24 wells.

Upon completion of the ^{refill} drill program, production will be increased by an anticipated 1120 barrels per day. The project will achieve a peak producing rate of 5460 barrels per day for 39 wells; that's 24 existing wells, plus the 13 ¹⁶ proposed wells. Ultimate primary recovery from the wells within the initial project area will be 16,654,000 barrels of oil; cumulative recovery is 10,875,000 barrels, which indicates that it is approximately 65% depleted at this time.

21 Q

Now, these figures assume that the Commission grants you the authority to in-field drill and also grants you the authority for the bonus allowable, is that correct.

25

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1 A That's correct.

2 Q Well, let's go into this bonus allowable. What
3 is the reason that Texaco feels it is crucial
4 to have this extra allowable?

5 A In our opinion, the bonus allowable is necessary to
6 prevent waste of oil reserves and to insure
7 the most efficient recovery of oil from the
8 reservoir, and I would refer you, again, to
9 Exhibits 8 and 9 which indicate that the pay
10 continuity in this portion of the reservoir
11 is in the ratio of 60% continuous, the total
12 pay period.

13 You can visualize, I think, from Exhibit No. 9,
14 that because of the heterogeneity of the
15 reservoirs, as the flood front in any of the
16 pattern of this reservoir fronts, from an injection
17 well to a producing well, that any response oil
18 that is not produced as it reaches the wellbore
19 will continue on past the producing well, and a
20 portion of it will enter into discontinuous
21 pay, which has been completed under primary
22 production but is not continuous to another
23 producing well. As the flood front then continues,
24 a portion of this trapped oil will be permanently
25

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1 trapped, due to the arrival of the flood front at
2 the producing well.

3 We estimate this loss to be in order of 1 million
4 barrels. This is a conservative estimate and
5 could be considerably more than that. We considered
6 one alternative of handling this problem, that
7 would be to limit injection rates in order to
8 limit the amount of response. However, by limiting
9 injection rates, this will have a detrimental
10 effect upon the injection profile due to the
11 same heterogeneity of the pay interval.

12 Under curtailed injection rates, the injection
13 profile would be altered and water would not enter
14 all of the zones that we desire to flood, resulting
15 in poor sweep efficiency. Maximum recovery, then,
16 is dependent upon maintaining optimum injection
17 rates. The only way to optimize injection rates
18 and vertical sweep efficiency, and at the same
19 time, to limit the loss of the reserves to discon-
20 tinuous pay, is to have the ability to produce all
21 of the response oil as it comes to the producing
22 wellbore. To do this requires a bonus allowable
23 of 75% above the project allowable.

24 Q Now, do you feel that there is an advantage as far
25 as ultimate recovery, to institute a pressure

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1 maintenance project now, rather than wait for
2 these wells to be depleted and then go into a
3 waterflood?

4 A Definitely, there is. By flooding the reservoir at
5 this higher pressure, at this present time,
6 secondary recovery will be increased 2,400,000
7 barrels, and this additional recovery is due to
8 the fact that at a higher performance, volume
9 factor, there will be fewer stock tank barrels
10 of oil left behind as residual oil.

11 Q So, what you are saying here, is that the granting
12 of this application in it's complete form will
13 save an estimated 2,400,000 barrels of oil that
14 would not be recovered; or are you just saying
15 that it would be delayed?

16 A That it would not be recovered.

17 Q So, I assume that 75% bonus allowable represents
18 your engineering estimate, or decision, of what
19 is necessary to produce this unit most efficiently
20 and that basically you are seeking the right to
21 produce all the oil that responds to your
22 pressure maintenance project, is that correct?

23 A That's correct.

24 MR. KELLY: Mr. Examiner, we would point out that
25 Texaco feels that under the 701D2, the Commission

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1 certainly has the authority to set what ever
2 allowables on a case by case basis. The
3 fresh maintenance project should have, and we
4 would, we feel there is no legal problem as far as
5 Commission granting this type of application and
6 that the evidence supports that it would certainly
7 support the conclusion that it would prevent
8 waste.

9 BY MR. KELLY:

10 Q

11 If the application were granted, and you were able
12 to produce this additional oil, you would probably
13 have additional casing head gas. Can you guarantee
14 to the Commission that you would have a purchaser
15 for both?

16 A

17 Yes, we have contacted Texas-New Mexico Pipe Line,
18 and Phillips Gas Pipe Lines, and we have a written
19 indication from each of them that they will be
20 able to handle the increased oil and casing head
21 gas production.

22 Q

23 Now, in your opinion, would this granting of these
24 two applications prevent waste by allowing you to
25 recover substantial amounts that would otherwise
be lost, and also protect the correlative rights
of off set operators in the area?

A

Definitely, it would.

1 Q Were Exhibits 1 and Exhibits 4 through 9 prepared
2 by you or under your supervision?

3 A They were.

4 Q And Exhibit 2 is a conformed copy of the unit
5 agreement?

6 A It is.

7 Q And Exhibit 3 is a copy of the land office's appro-
8 val?

9 A Right.

10 MR. KELLY: I would move at this time the
11 introduction of Exhibit's 1 through 9.

12 MR. UTZ: Without objection, Exhibit's 1 through 9
13 will be entered into this case.

14 MR. KELLY: We have no further direct testimony.

15 CROSS EXAMINATION BY MR. UTZ:

16 Q In referring to the project area, don't we consider
17 the off-sets and diagonal off-sets as a part of
18 the project area, that is to injection wells?

19 A As I recall, the waterflood projects are spelled
20 out that way. I think pressure maintenance are
21 not specifically spelled out, but historically,
22 that's the way they've been interpreted.

23 Q What are you asking for, now, you are asking for
24 the project area to be the area outlined in pencil
25 on Exhibit 1, or the unit?

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- 1 A The project area that, really, this was in
2 anticipation of what would be granted, it's the
3 penciled, outlined area.
- 4 Q I'm sure Texaco would have no objections if the
5 Commission were to grant the project area as the
6 unit area.
- 7 A It would certainly be to our benefit, of course, to
8 have the entire unit area designated as a project
9 area. But since there were no specific guidelines
10 here for the pressure maintenance project, like I
11 say, this is what we anticipated.
- 12 Q Well, in your opinion, were the wells outside
13 or beyond and to the outside of the project wells,
14 injection wells, receive any benefit from your
15 injection?
- 16 A Possibly, but that's something we could not
17 demonstrate.
- 18 Q And, what you are telling me here is that the new
19 depth factor allowables for the area outlined by
20 pencil on your Exhibit 1 will not be such to
21 handle the oil produced?
- 22 A That's correct.
- 23 Q And that increased by 75%?
- 24 A Right.
- 25 Q Now, if the Commission should decide to allow

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1 you the unit area as your project area, how would
2 that effect your production?
3 A I would have to do a little calculating there to
4 see if that would be sufficient.
5 Q You would have quite a few additional wells,
6 wouldn't you?
7 A That would entail 35 existing wells, and 15
8 proposed wells, so that's 50 at 80 barrels a day
9 that's 4,000, and we anticipate a peak producing
10 rate here of 5460 barrels per day. So that
11 allowable still would not be adequate to handle
12 all the response oil that we anticipate.
13 Q How many producing wells will you have in the
14 unit there?
15 A There are 35 existing wells, and we are going to
16 drill seven more.
17 Q Being 45 wells?
18 A Yes.
19 Q And what is the depth factor allowable?
20 A Eighty--3,600 barrels.
21 Q So even then you would need an increase in ratio--
22 increase by a ratio of 3600 to 5460?
23 A That's correct.
24 Q Okay, would you clarify for me as to how you are
25 commingling now?

1 A Yes, we have one central battery located on our
2 SE tract 1 lease, that is in the Northwest portion
3 of the unit. Production from each of these
4 individual leases in the unit area and other
5 leases outside the unit area even, for example, our
6 S lease which is to the North there is one.
7
8 production is metered continuously on these
9 individual leases and then transported down to the
10 central battery and commingled at that point.
11 Q Now, how would the oil produced from the unit area
12 be handled? Would that be considered one lease?
13 A We plan to continue metering production from the
14 separate tracts.
15 Q From each separate lease?
16 A Yes.
17 Q Now, referring to Exhibit 6, all your producing
18 wells, as I understand, are on location?
19 A Yes.
20 Q And how about the ones with edges, are they on
21 standard location?
22 A Yes.
23 Q So everything is on standard?
24 A Yes sir.
25 Q And to the best of your knowledge, these are the
locations which you intend to drill, is that right?

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1 A That's right.

2 Q So, in addition to that, you are asking, are you

3 not, for administrative approval of any other

4 standard and non-standard locations?

5 A That's correct.

6 Q For producing and injection wells?

7 A Yes sir. I might add here, too, that we do

8 anticipate expanding this project area, maybe

9 at a later date, of course, depending upon the

10 performance of the initial project area by

11 drilling additional injection and producing wells,

12 extending it out to the unit battery. At that

13 time, of course, we would either have a cooperative

14 agreement with the other off-set operators, or,

15 if it's possible, we might attempt to expand the

16 unit boundary itself at that time. But one

17 way of the other, we would include the off-set

18 operators, cooperate with them.

19 Q Now, it would be under the present conditions,

20 it's your intention of producing more than a depth

21 factor allowable from the outside wells, or wells

22 adjoining the boundries of the unit?

23 A Only insofar as they are also in the project area.

24 Q Well, Well number 4 and number 4 on the westside

25 of the unit would qualify for that, would they not?

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1 A Yes.

2 Q As well as number 7-5 and 2-2?

3 A Yes.

4 Q Now, what difficulty would you encounter in

5 limiting those wells to one depth factor allowable?

6 A It's possible that one problem that would be

7 involved in this would be that since we are

8 injecting back to the interior of the project area,

9 that if we were not able to produce these wells

10 at a sufficient rate to recover all the response

11 oil, we could push oil from the unitized area to

12 the leases outside of the unit area.

13 Q Well, we have a proposal by Phillips and we may

14 as well consider that because at this point, and

15 on the record, that you be limited to these wells

16 or to the allowable for these wells to one depth

17 factor allowable. Now, as I peruse your map here,

18 is Phillips involved in only Section 35 to the

19 north of the unit?

20 A That's right.

21 Q And under the project rules you proposed here,

22 they would not be effected?

23 A That's right.

24 MR. UTZ: Are there any other questions of the

25 witness?

1 REDIRECT EXAMINATION BY MR. KELLY:

2 Referring back to Exhibit No. 5, in answer to
3 the Examiner's question, the wells in the project
4 area, what are their current allowables now, on
5 the outside boundary?
6

7 A By and large they are top allowable wells at the
8 present time.

9 Q So, if they were limited, you wouldn't be able to
10 produce any response oil?

11 A That's correct.

12 Q And you did inform all off-set operators of this
13 application, is that correct.

14 A Yes, they received a copy of our application.

15 MR. KELLY: I have nothing further.

16 MR. UTZ: The witness may be excused.

17 Are there statements in the case?
18

19 (No response)
20

21 MR. UTZ: The Commission has a letter from
22 Phillips Petroleum which I will read their proposal into
23 the record. Did you receive a copy of this?

24 MR. KELLY: Yes, we did.

25 MR. UTZ: Well, in fact, it requests that a rule

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1 be incorporated in the order to limit any directly or
2 diagonally off-set wells to the outside boundary of the unit
3 to one depth factor allowable.
4

5 We have discussed this in the record, which ought
6 to be sufficient.

7 The cases will be taken under advisement and the
8 hearing is adjourned.
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1 STATE OF NEW MEXICO)
2 COUNTY OF BERNALILLO) ss
3)

4 I, JOHN DE LA ROSA, A Certified Shorthand Reporter,
5 do hereby certify that the foregoing and attached Transcript
6 of Hearing before the New Mexico Oil Conservation Commission
7 was reported by me; and that the same is a true and correct
8 record of the said proceedings, to the best of my knowledge,
9 skill and ability.
10
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John De La Rosa

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing of Case No. 4852
heard by me on *Sept 1* 19*72*
[Signature] Examiner
New Mexico Oil Conservation Commission

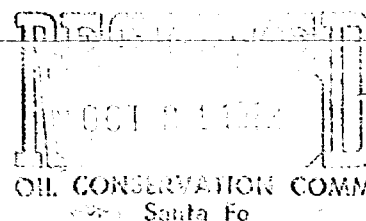


PHILLIPS PETROLEUM COMPANY

ODESSA, TEXAS 79760
PHILLIPS BUILDING, FOURTH & WASHINGTON

EXPLORATION & PRODUCTION DEPARTMENT

October 17, 1972



In re: Cases Nos. 4851 and 4852--
Application of Texaco Inc.
for Unitization and Pressure
Maintenance Project--Vacuum
Grayburg/San Andres Pool,
Lea County, New Mexico

File: W2-Ed-632-72

New Mexico Oil Conservation Commission - 3
P. O. Box 2088
Santa Fe, New Mexico 88750

Attention: Mr. A. L. Porter
Secretary-Director

Gentlemen:

Phillips Petroleum Company, as an Offset Operator, has been duly notified by Texaco Inc. of their application before the Commission for the approval of a unitization and pressure maintenance project in the Vacuum Grayburg/San Andres Field, Lea County. Said application is docketed as Cases Nos. 4851 and 4852 to be heard on November 1, 1972, and covers leases comprising Sections 1 and 2, NE/4 NE/4 Section 11, and N/2 NW/4 Section 12, all in T-17-S, R-35-E.

Phillips Petroleum Company hereby waives any and all objections to the approval of the proposed unit and project, subject to the following conditions:

"That any producing well in the unit area which directly or diagonally offsets a well outside the unit area producing from the same common source of supply shall not be granted any bonus allowable nor be permitted to produce in excess of top unit allowable for the pool without having same authorized only after notice and hearing, showing that substantial response to injection has occurred".

Yours very truly,

PHILLIPS PETROLEUM COMPANY

G. W. Edwards, Supervisor
Reservoir Engineering

HM:rm

cc: New Mexico Oil Conservation Commission, Box 1980, Hobbs, New Mexico 88240
Texaco Inc., Attention Mr. R. G. Brown, Assistant Division Manager,
P. O. Box 3109, Midland, Texas 79701

$$\begin{array}{r} 35 \\ 11 \\ \hline 24 \end{array}$$

$$\begin{array}{r} 4 \\ 35 \\ 80 \\ \hline \sqrt{2800} \\ 400 \\ \hline 3200 \end{array}$$

$$\frac{15 \times 80}{3} = 400$$

$$\begin{array}{r} 21\frac{1}{2} \\ 15 \overline{) 320} \\ \underline{30} \\ 20 \\ \underline{15} \\ 5 \end{array}$$

$$\begin{array}{r} 24 \\ 80 \\ \hline 1920 \end{array}$$

$$\begin{array}{r} 3120 \\ 2800 \\ \hline 320 \end{array}$$

$$\begin{array}{r} 24 \\ 15 \\ \hline 39 \end{array}$$

$$\begin{array}{r} 2800 \\ 175 \\ \hline 4900 \end{array}$$

20 15 well

$$\begin{array}{r} 11 \\ 80 \\ \hline 880 \end{array}$$

$$\begin{array}{r} 80 \\ 3120 \\ \times 175 \\ \hline 5460 \\ 880 \\ \hline 6340 \end{array}$$

$$\begin{array}{r} 35 \\ 15 \\ \hline 50 \\ 80 \\ \hline 4000 \end{array}$$

$$\begin{array}{r} 35 \\ 15 \\ \hline 50 \\ 80 \\ \hline 4000 \\ 2800 \\ \hline 1200 \end{array}$$

$$\begin{array}{r} 35 \\ 80 \\ \hline 2800 \end{array}$$

$$\begin{array}{r} 1508 \\ 121 \overline{) 181000} \end{array}$$

59

wells, location of gas wells in conformance with the Southeast New Mexico 320-acre gas well location rules, and classification of wells as gas wells at a gas-liquid ratio of 30,000 or more. Oil wells in said area would be governed by the statewide rules.

CASE 4851: Application of Texaco Inc. for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of a unit area comprising 1400 acres, more or less, of state lands in Sections 1, 2, 11, and 12, Township 18 South, Range 34 East, Lea County, New Mexico.

CASE 4852: Application of Texaco Inc. for a pressure maintenance project and special rules therefor, Lea County, New Mexico. Applicant, in the above-styled cause, seeks to institute a pressure maintenance project in the Vacuum Grayburg-San Andres Pool by the injection of water through 8 wells at orthodox and unorthodox locations in Sections 1 and 2, Township 18 South, Range 34 East, Lea County, New Mexico. Applicant further seeks authority to drill 8 producing wells within the boundaries of said project at unorthodox locations and the assignment of a bonus allowable to said project.

CASE 4853: Application of El Paso Natural Gas Company for amendment of gas well testing procedures, San Juan Basin, New Mexico. Applicant, in the above-styled cause, seeks the amendment of the gas well testing procedures for the San Juan Basin, New Mexico, promulgated by Order No. R-333-F, as amended, to remove the requirement for annual deliverability and shut-in pressure tests for marginal wells.

CASE 4854: Application of Dugan Production Corporation to commingle gas production prior to metering, San Juan County, New Mexico. Applicant, in the above-styled cause, seeks authority to commingle gas produced from wells located in Sections 25, 26, 35, and 36, Township 28 North, Range 15 West, undesignated Pictured Cliffs gas pool, San Juan County, New Mexico, prior to metering said gas, as an exception to Rule 403 of the Commission Rules and Regulations.

DOCKET: EXAMINER HEARING - WEDNESDAY - NOVEMBER 1, 1972

9 A.M. - OIL CONSERVATION COMMISSION CONFERENCE ROOM,
STATE LAND OFFICE BUILDING, SANTA FE, NEW MEXICO

The following cases will be heard before Daniel S. Nutter, Examiner, or Elvis A. Utz, Alternate Examiner:

CASE 4835: (Continued from the September 27, 1972, Examiner Hearing)

Application of Texas Oil & Gas Corporation for compulsory pooling, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests from the surface of the ground down to and including the Pennsylvanian formation underlying the S/2 of Section 13, Township 22 South, Range 26 East, South Carlsbad Field area, Eddy County, New Mexico, to be dedicated to a well to be drilled 1980 feet from the South and East lines of said Section 13. Also to be considered will be the costs of drilling said well, a charge for the risk involved, a provision for the allocation of actual operating costs, and the establishment of charges for supervision of said well.

CASE 4849: Application of Harding Oil Company for pool creation, special rules therefor, and discovery allowable, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the creation of a new pool for the production of oil from the Atoka formation for its Shipp Well No. 4 located in Unit I of Section 11, Township 17 South, Range 37 East, Lea County, New Mexico, and the promulgation of special rules therefor, including a provision for 80-acre spacing and proration units. Applicant further seeks the assignment of a discovery allowable of approximately 58,310 barrels of oil to said well.

CASE 4850: Application of Dalport Oil Corporation for amendment of pool rules, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Rule 2 (a) and Rule 7 of the special rules governing the Double L-Queen Associated Pool, Chaves County, New Mexico, to increase the size of a standard gas well proration unit from 160 acres to 320 acres and a corresponding increase in the gas allowable.

CASE 4843: (Continued from the October 17, 1972, Examiner Hearing)

Application of Dalport Oil Corporation for designation of a special gas area and special rules therefor, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks the designation of the Southeast Chaves Queen Gas Area comprising all of Townships 12 and 13 South, Ranges 30 and 31 East, Township 14 South, Ranges 29, 30 and 31 East, and Township 15 South, Ranges 29 and 30 East.

Applicant further seeks the promulgation of special rules for said area including a provision for 320-acre spacing for gas

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. 4852
Order No. R-4442

APPLICATION OF TEXACO INC FOR A
PRESSURE MAINTENANCE PROJECT AND
SPECIAL RULES THEREFOR, LEA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on November 1, 1972, at Santa Fe, New Mexico, before Examiner Elvis A. Utz.

NOW, on this 27th day of November, 1972, 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, Texaco Inc., seeks authority to institute a pressure maintenance project in its Vacuum Grayburg San Andres Unit Area, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, by the injection of approximately 1,500 barrels of water per day into the Grayburg and San Andres formations through each of eight injection wells proposed to be drilled at unorthodox locations in Sections 1 and 2, Township 18 South, Range 34 East, NMPM.

(3) That the applicant also seeks authority to drill seven additional producing wells at unorthodox locations in said Sections 1 and 2.

(4) That the applicant further seeks the designation of a project area and the promulgation of rules for the project area, including provision for the assignment of top unit allowable to all wells in the project area, top unit allowable to each of the 15 additional injection and producing wells to be drilled in the project area, and an additional 75 percent of top unit allowable to be assigned to each well in the project area as a bonus allowable for the injection of water.

-2-

Case No. 4852

Order No. R-4442

(5) That a pressure maintenance project area comprising all of the Vacuum Grayburg San Andres Unit Area, being all of Sections 1 and 2, the NE/4 NE/4 of Section 11, and the N/2 NW/4 of Section 12, all in Township 18 South, Range 34 East, is in the interest of conservation and should result in greater ultimate recovery of oil, thereby preventing waste.

(6) That top unit allowable for the Vacuum Grayburg-San Andres Pool should be assigned to all wells in the project area upon initiation of substantial water injection, and each of the proposed 15 additional wells should also receive top unit allowable upon completion. That the project allowable should be the sum of the allowables assigned to the wells in the project area and should be permitted to be produced from any well in the project area, provided however, that any producing well in the project area which directly or diagonally offsets a well outside the project area producing from the same common source of supply should not be permitted to produce in excess of top unit allowable for the pool without a showing at public hearing that substantial response to water injection has occurred in said well.

(7) That approval of the proposed eight injection wells and seven producing wells, all at unorthodox locations, and the proposed pressure maintenance project, subject to the provisions of Finding No. (6) above, will not cause but will prevent waste and will protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Texaco Inc, is hereby authorized to operate a pressure maintenance project in its Vacuum Grayburg San Andres Unit Area, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, to be designated the Texaco Vacuum Grayburg-San Andres Pressure Maintenance Project, by the injection of water into the Grayburg and San Andres formations through eight injection wells to be drilled at the following unorthodox locations in Township 18 South, Range 34 East, NMPM:

<u>LEASE NAME</u>	<u>WELL NO</u>	<u>LOCATION</u>	<u>SECTION</u>
New Mexico "M" State	11	2630' FNL & 1310' FWL	1
New Mexico "M" State	12	1330' FNL & 2630' FWL	1
New Mexico "AC" NCT-1 State	11	2630' FSL & 1330' FEL	2
New Mexico "AC" NCT-1 State	14	1400' FSL & 2550' FEL	2
New Mexico "AC" NCT-1 State	16	1400' FSL & 10' FEL	2
New Mexico "R" NCT-3 State	20	1310' FSL & 2630' FEL	1
New Mexico "R" NCT-3 State	23	100' FSL & 1420' FWL	1
New Mexico "Z" NCT-1 State	8	2630' FNL & 1310' FWL	2

(2) That the applicant is hereby authorized to drill seven additional producing wells in its Vacuum Grayburg San Andres

-3-

Case No. 4852
Order No. R-4442

Pressure Maintenance Project at the following unorthodox locations in Township 18 South, Range 34 East, NMPM:

<u>LEASE NAME</u>	<u>WELL NO</u>	<u>LOCATION</u>	<u>SECTION</u>
New Mexico "M" State	10	1330' FNL & 1330' FWL	1
New Mexico "AC" NCT-1	12	2630' FSL & 2630' FWL	2
State			
New Mexico "AC" NCT-1	15	1400' FSL & 1300' FEL	2
State			
New Mexico "R" NCT-3	17	2630' FSL & 2630' FEL	1
State			
New Mexico "R" NCT-3	18	2630' FSL & 10' FWL	1
State			
New Mexico "R" NCT-3	19	1330' FSL & 1330' FWL	1
State			
New Mexico "R" NCT-3	22	100' FSL & 100' FWL	1
State			

(3) That Special Rules and Regulations governing the operation of the Texaco Vacuum Grayburg-San Andres Pressure Maintenance Project are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
TEXACO INC. VACUUM GRAYBURG-SAN ANDRES
PRESSURE MAINTENANCE PROJECT

RULE 1. The project area of the Texaco Inc. Vacuum Grayburg-San Andres Pressure Maintenance Project, hereinafter referred to as the Project, shall comprise the area described as follows:

LEA COUNTY, NEW MEXICO
TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Sections 1 and 2: All
Section 11: NE/4 NE/4
Section 12: N/2 NW/4

RULE 2. The allowable for the project area shall be known as the project allowable and shall be equal to top unit allowable for the Vacuum Grayburg-San Andres Pool times the number of wells in the project area completed in the Grayburg and/or San Andres formations for production from, or injection into, said formations.

RULE 3. The project allowable may be produced from any well or wells completed in the Vacuum Grayburg-San Andres Pool in the project area, provided however, that any well in the project area which directly or diagonally offsets a well outside the project area producing from the same common source of supply shall not be permitted to produce in excess of top unit

allowable for the Vacuum Grayburg-San Andres Pool until it has been established after notice and hearing that such well has experienced a substantial response to water injection.

RULE 4. Each producing well in the project area shall be subject to the limiting gas-oil ratio (2500 to one) for the Vacuum Grayburg-San Andres Pool.

RULE 5. Each month the project operator shall, by the 15th day of the month, submit to the Hobbs district office of the Commission a report for the previous month showing average daily water injection into each injection well, total water injected into each well, and total cumulative water injected into each well. The report shall also list each producing well, and average daily and total monthly production from same, together with a nomination of proposed daily allowable for each of said wells for the following month. The aforesaid report shall be filed in lieu of Form C-120 for the project.

RULE 6. The Commission shall, upon review of the report and after any adjustments deemed necessary in accordance with Rules 3 and 4 of these rules, assign an allowable to each of the various producing wells in the project area for the next succeeding month.

RULE 7. The conversion of producing wells to injection, or the drilling of additional wells for injection purposes shall be accomplished only after approval of the same by the Secretary-Director of the Commission. To obtain such approval, the Project operator shall file application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional injection wells shall include the following:

(1) A plat showing the location of proposed injection well, all wells within the project area, and offset operators, locating wells which offset the project area.

(2) A schematic drawing of the proposed injection well which fully describes the casing, tubing, perforated interval, and depth showing that the injection of water will be confined to the Grayburg and San Andres formations.

(3) A letter stating that all offset operators within one-half mile of the proposed injection well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed injection well, if within 20 days after receiving the application, no objection to the proposal is received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

-5-

Case No. 4852
Order No. R-4442

Expansion of the project area may be approved by the Secretary-Director of the Commission administratively when good cause is shown therefor.

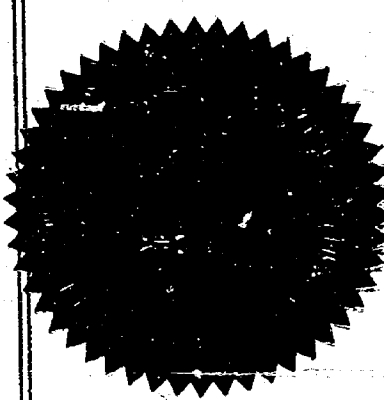
RULE 8. Additional producing wells may also be drilled at unorthodox locations anywhere within the project area not closer than 1320 feet of the outer boundaries of the project area. The Secretary-Director of the Commission shall have authority to grant permission to drill any well within the provisions of this rule without notice and hearing.

(4) That the effective date of the allowable provisions of this order shall be the date that actual water injection operations commence in a minimum of four of the eight authorized injection wells.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION



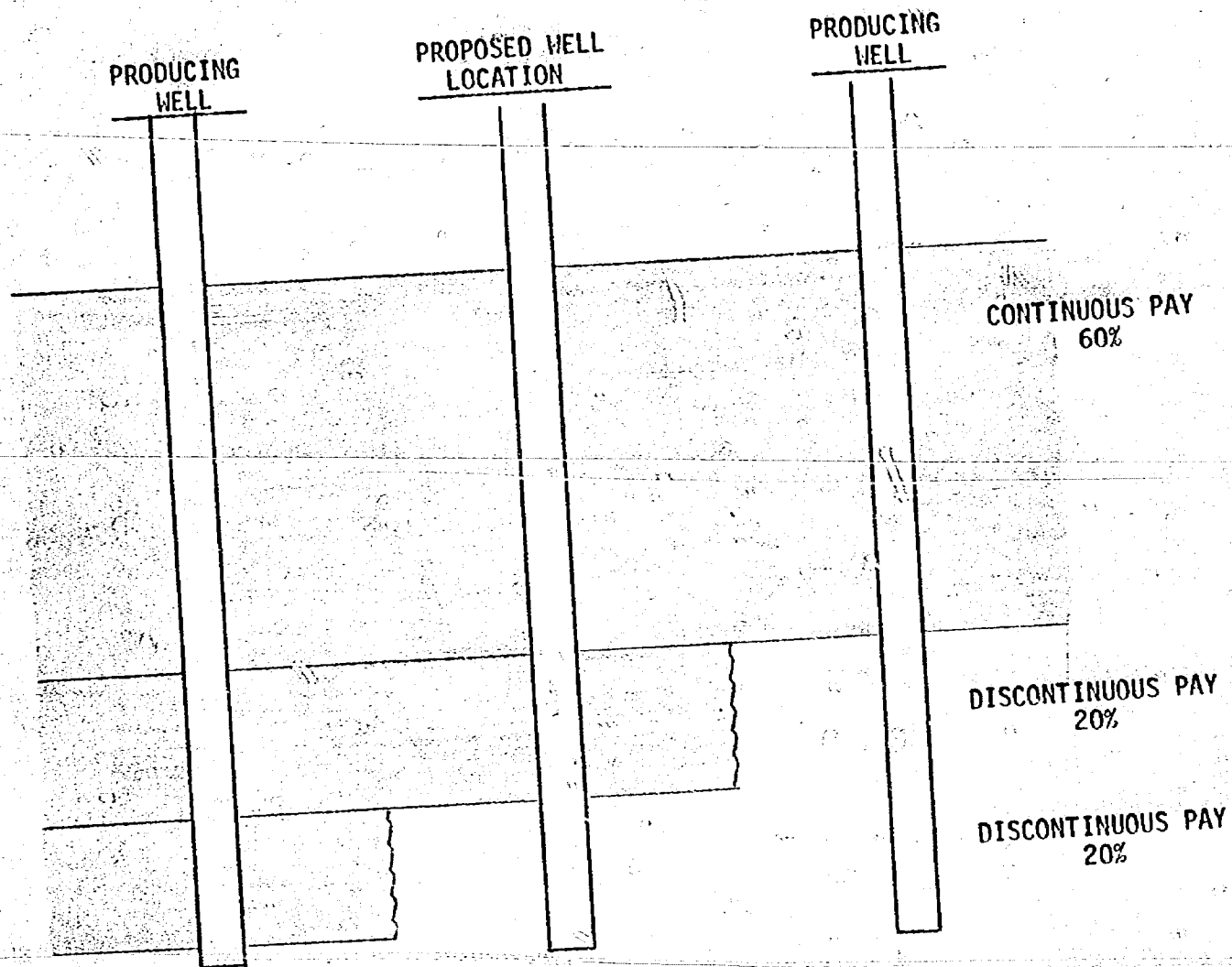
Bruce King
BRUCE KING, Chairman

Alex J. Armijo
ALEX J. ARMILLO, Member

A. L. Porter, Jr.
A. L. PORTER, Jr., Member & Secretary

S E A L

dr/



SCHEMATIC OF VACUUM GRAYBURG-SAN ANDRES
DISCONTINUOUS PAY QUALITY

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Texaco EXHIBIT NO. 8
CASE NO. 4851 & 4852
Filed by _____
Date _____

Case 4852

OIL CONSERVATION COMMISSION
P. O. BOX 2088
SANTA FE, NEW MEXICO 87501

March 10, 1978

Texaco Inc.
Drawer 728
Hobbs, New Mexico 88240

Attention: Mr. J. V. Gannon

Gentlemen:

Your letter of February 17, 1978, to Mr. Jerry Sexton has been forwarded to this office for reply.

After reviewing the situation, this office would have no objection to your increasing injection to the volume that would equal withdrawals from the Vacuum Grayburg San Andres Unit area.

Should you desire further increases in injection rates or pressures, it will be necessary that you submit step rate tests on all injection wells in the unit.

Yours very truly,

JOE D. RAMEY
Director

JDR/fd

C
O
P
Y



PETROLEUM PRODUCTS

February 17, 1978

TEXACO INC.
DRAWER 728
HOBBS, NEW MEXICO 88240

VACUUM GRAYBURG-SAN ANDRES UNIT

Mr. Jerry Sexton
District Supervisor
New Mexico Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico 88240

Dear Sir:

Texaco requests the Commission's permission to raise the surface injection pressure on the subject project from the current maximum of 1100 psia to a maximum of 1500 psia.

Texaco has cooperated with the Commission throughout the lengthy water-flow investigation in Lea County, including the voluntary cutback in injection pressure on the subject project in early 1977. Texaco has spent approximately \$400,000 on every conceivable procedure to locate the source of the salt zone pressure and no cause has been found. The "Show Cause" Hearing of June 13, 1977 resulted in no State Order restricting injection pressure. On August 24, 1977 the State issued Memo No. 3-77 which established 0.2 psi per foot of depth as the highest allowable injection pressure for new projects and expansions to existing projects, but which did not apply to existing injectors. There have been no orders or memos restricting pressures on existing injection wells, either on a permanent or temporary basis. In fact, Order R-5636 postponed any new rules imposing pressure restrictions on existing injection wells.

Texaco was cautioned by the Commission last July against raising the pressure on the subject project. Meanwhile, other secondary recovery projects in the same field or area continue to inject at high pressures. Following is a table of these projects and their pressures:

OPERATOR and UNIT	MAXIMUM	APPROX.	APPROX.
	SURFACE PRESSURE - PSI	DEPTH	PSI/FOOT
Mobil's Bridges State	2440	4700'	0.52
Mobil's Vacuum, North Abo	4180	8700'	0.48
Texaco's West Vacuum	2150	4600'	0.47
Texaco's Vacuum G.S.A.	1100	4500'	0.24



Working to keep
your trust for
75 years

FEBRUARY 17, 1978

Texaco considers it unfair to continue to impose a pressure restriction against the Vacuum GSA Unit while allowing all other secondary recovery projects in the area to operate unrestricted. The subject project cannot replace withdrawals at an 1100 psi pressure limit. This restriction is costing Texaco 1100 to 1200 barrels of oil per month with the loss anticipated to reach 14,384 barrels of oil in December of this year. The injection-to-withdrawal ratio has exceeded 1:1 in only two months since injection was voluntarily restricted in April of 1977, and the ratio has averaged 0.90 since last April.

We cannot effectively flood all potential secondary reserves at the current low pressure. At 1100 psi, injection volume is less than 13,000 BPD. At the requested 1500 psi a volume of 23,000 BPD could be injected. This would be a pressure gradient of 0.33 psi/foot, which is still less than that allowed for the other projects in the area. If injection is not permitted to replace withdrawals, the reservoir can never be pressured to yield a higher fracture gradient, which means the project will be permanently penalized with respect to its nearby competitors.

It has been our experience in San Andres reservoirs throughout the Permian Basin that low injection pressures (yielding an injection-to-withdrawal ratio less than unity) will cause injection water to preferentially sweep out the high permeability zones and not effectively sweep medium to low permeability zones. A large proportion of San Andres secondary reserves are contained in low permeability portions of the reservoir.

In addition, at the current low pressure restriction the project will never show the normal production increase associated with successful waterflood response. This lack of production response adversely affects the economic benefits which were the bases for investing almost 3 million dollars to waterflood this project. At low injection rates, project life will be extended to the point where inflated operating costs and reduced present value income will cause premature abandonment and loss of reserves.

Very truly yours,

J. G. Gannon
J. G. Gannon

District Superintendent

SES:las



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

November 28, 1972

GOVERNOR
BRUCE KING
CHAIRMAN
LAND COMMISSIONER
ALEX J. ARMUJO
MEMBER
STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY - DIRECTOR

Mr. Booker Kelly
White, Koch, Kelly & McCarthy
Attorneys at Law
Post Office Box 787
Santa Fe, New Mexico

Re: Case No. 4852
Order No. R-4442
Applicant:
Texaco Inc.

Dear Sir:

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

Very truly yours,

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

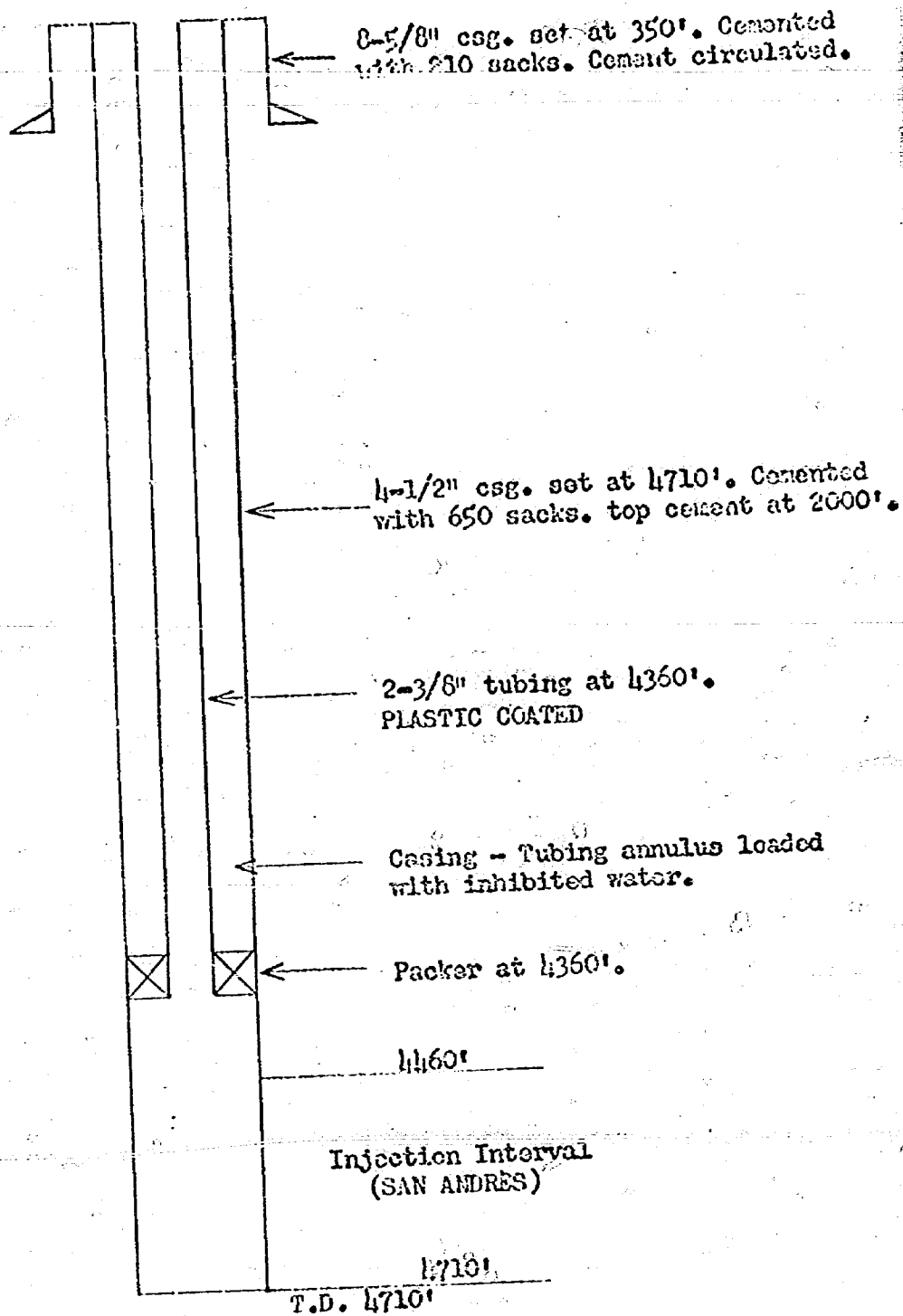
Copy of order also sent to:

Hobbs OCC x

Artesia OCC

Aztec OCC

Other State Engineer Office



Diagrammatic sketch of typical injection well

TEXACO INC.
NEW MEXICO "R" STATE (NCT-3) NO. 20
VACUUM GRAYBURG-SAN ANDRES POOL
LEA COUNTY, NEW MEXICO

BEFORE EXAMINER U.S.
OIL CONSERVATION COMMISSION

EXHIBIT NO. _____

SUMMARY OF WELLS TO BE DRILLED

move wells 10
off of quarter quarter
section lines

Lease	Well No.	Producing	Section	Township	Range
New Mexico 'M' State	10	1320' FNL & 1320' FWL 1330 N 1330 W	1	18-S	34-E ✓
New Mexico 'AC' (NCT-1) St.	12	2630' FSL & 2640' FEL 2630 S 2630 W	2	18-S	34-E ✓
	15	1400' FSL & 1300' FEL OK	2	13-S	34-E ✓
New Mexico 'R' (NCT-3) St.	17	2630' FSL & 2640' FEL 2630 S 2630 E	1	18-S	34-E ✓
	18	10' FWL & 2630' FSL	1	18-S	34-E ✓
	19	1320' FWL & 1320' FSL 1330 S 1330 W	1	18-S	34-E ✓
	22	100' FSL & 100' FWL	1	18-S	34-E ✓

Injection

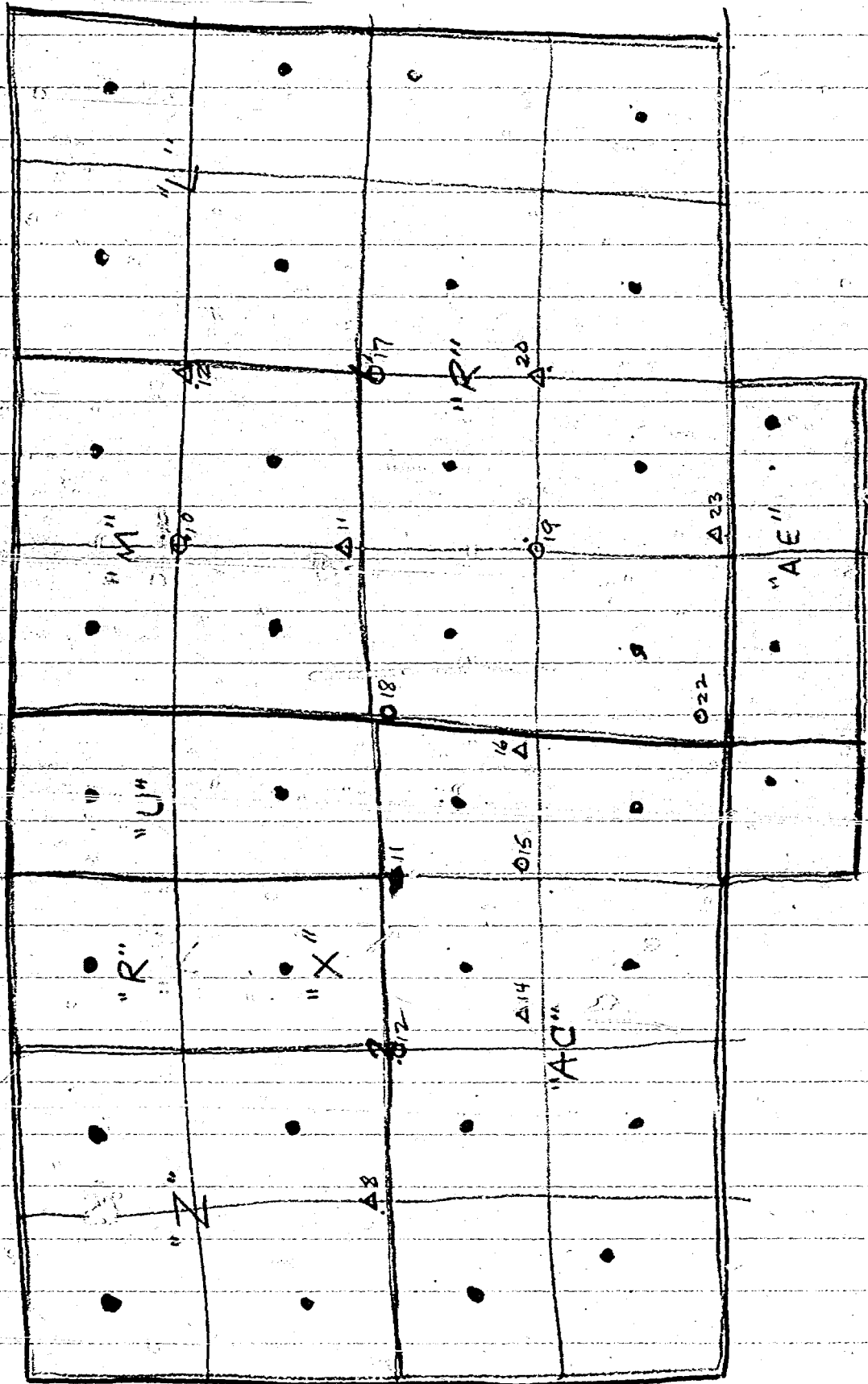
New Mexico 'M' State	11	2630' FNL & 1320' FWL 2630 N 1310 W	1	18-S	34-E ✓
	12	1320' FNL & 2630' FWL 1330 N 2630 W	1	18-S	34-E ✓
New Mexico 'AC' (NCT-1) St.	11	2630' FSL & 1320' FEL 2630 S 1330 E	2	18-S	34-E ✓
	14	1400' FSL & 2550' FEL	2	18-S	34-E ✓
	16	1400' FSL & 10' FEL	2	18-S	34-E ✓
New Mexico 'R' (NCT-3) St.	20	1320' FSL & 2640' FEL 1310 S 2630 E	1	18-S	34-E ✓
	23	100' FSL & 1420' FWL	1	18-S	34-E ✓
New Mexico 'Z' (NCT-1) St.	8	2630' FNL & 1320' FWL 2630 N 1310 W	2	18-S	34-E ✓

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION

EXHIBIT NO. _____

CASE NO. _____

HEARING DATE _____



LEASE	WELL NO.	ALLOWABLE	OIL	WATER	GOR
New Mexico 'Z' (NCT-1) State	1	80	89	0	2182
	2	80	87	0	2042
	3	80	86	0	2281
	4	80	87	0	1990
					642
New Mexico 'R' (NCT-2) State	4	72	70	0	2160
			85	0	
New Mexico 'X' (NCT-2) State	3	80	100	0	1890
			100	0	2188
New Mexico 'V' State	1	80	100	0	2380
	2	80	82	2	2234
			100	3	2201
			83	1	2140
New Mexico 'M' State	1	80	81	1	2388
	2	80	82	2	2315
	3	80	100	1	2250
	4	80	100	2	2400
New Mexico 'L' State	1	80	81	5	1843
	2	80	80	80	1938
	3	80	100	30	1158
	4	80	79	3	1696
New Mexico 'AC' (NCT-1) State	1	70	100	0	1974
	2	66	100	208	1310
	3	66	23	94	900
	4	80	11	24	2745
	5	63	55	0	
	6	32	48	0	
	7	57			
	10	58			
New Mexico 'R' (NCT-3) State	6	86	86	0	2209
	7	80	80	10	1500
	8	80	100	117	640
	9	80	100	0	1046
	10	80	100	106	953
	11	80	80	0	2282
	12	80	84	0	2270
	13	80	89	0	1288

BEFORE EXAMINER
OIL CONSERVATION COMMISSION

Received EXHIBIT NO. 5

DATE NO. 48518 4852

Witnessed by _____

Hearing Date _____

25 Tallow
10 Mace

4380
2800
1580
3360
560

25 Tallow
10 Olfare

CURRENT PRODUCING RATES AND ALLOWABLES
(SEPTEMBER, 1972)

<u>LEASE</u>	<u>WELL NO.</u>	<u>ALLOWABLE</u>	<u>OIL</u>	<u>WATER</u>	<u>GOR</u>
New Mexico 'AE' (NCT-4) State	2	22	10	0	1100
	22	35	20	2	1870
	23	6	2	6	1450
		<u>6</u>			

2481

2660

SUMMARY OF WELLS TO BE DRILLED

<u>Lease</u>	<u>Well No.</u>	<u>Producing</u>	<u>Section</u>	<u>Township</u>	<u>Range</u>
New Mexico 'M' State	10	1320' FWL & 1320' FWL	1	18-S	34-E
New Mexico 'AC' (NCT-1) St.	12	2630' FSL & 2640' FEL	2	18-S	34-E
	15	1400' FSL & 1300' FEL	2	18-S	34-E
New Mexico 'R' (NCT-3) St.	17	2630' FSL & 2640' FEL	1	18-S	34-E
	18	10' FWL & 2630' FSL	1	18-S	34-E
	19	1320' FWL & 1320' FSL	1	18-S	34-E
	22	100' FSL & 100' FWL	1	18-S	34-E

NSL?
all.

		<u>Injection</u>			
New Mexico 'M' State	11	2630' FWL & 1320' FWL	1	18-S	34-E
	12	1320' FWL & 2630' FWL	1	18-S	34-E
New Mexico 'AC' (NCT-1) St.	11	2630' FSL & 1320' FEL	2	18-S	34-E
	14	1400' FSL & 2550' FEL	2	18-S	34-E
	16	1400' FSL & 10' FEL	2	18-S	34-E
New Mexico 'R' (NCT-3) St.	20	1320' FSL & 2640' FEL	1	18-S	34-E
	23	100' FSL & 1420' FWL	1	18-S	34-E
New Mexico 'Z' (NCT-1) St.	3	2630' FWL & 1320' FWL	2	18-S	34-E

NSL
all.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION

EXHIBIT NO. 6

CASE NO. 4851 & 4852

Submitted by _____

Hearing Date _____

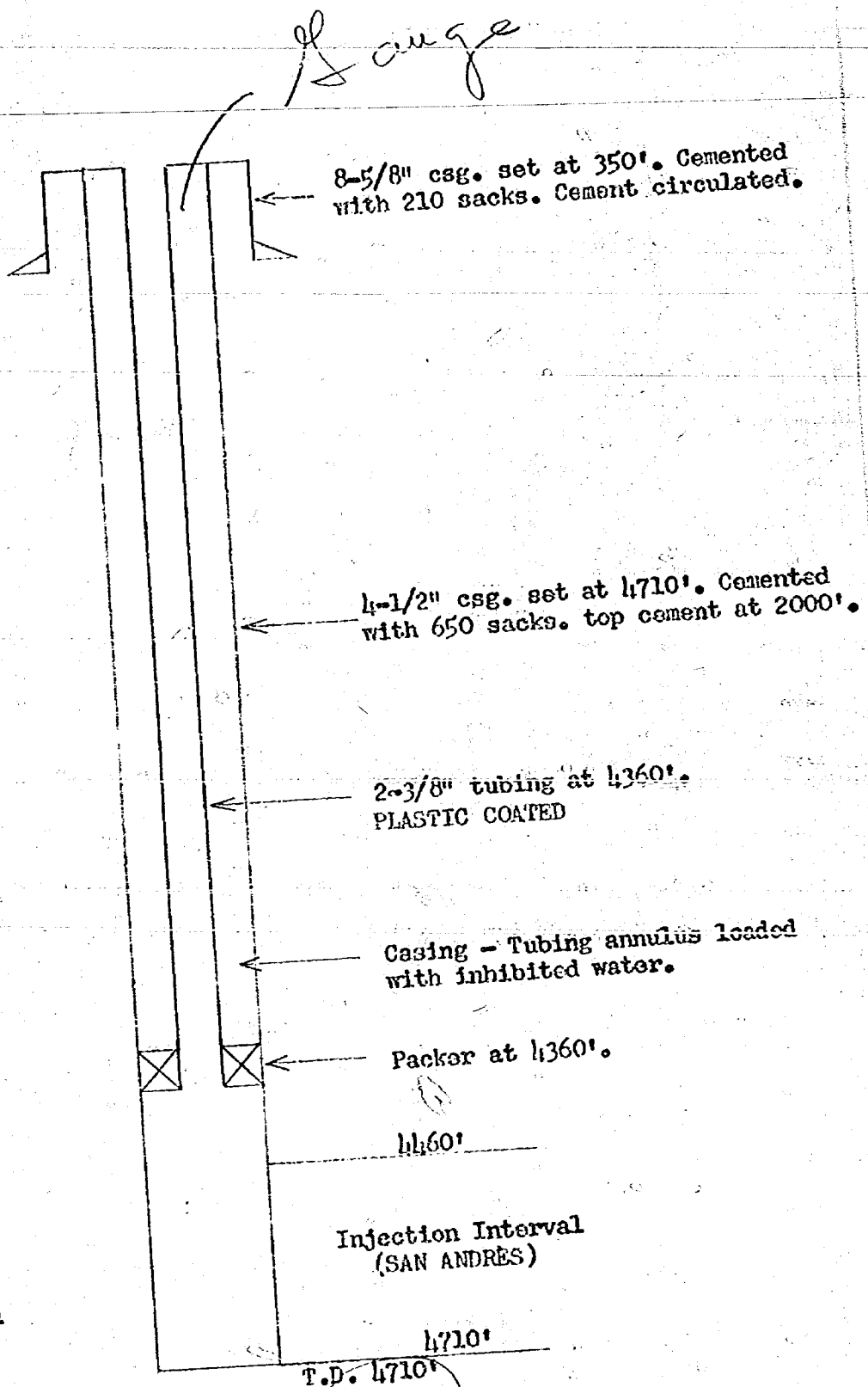
BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION

Case EXHIBIT NO. 7

CASE NO. 4851 & 4852

Submitted by _____

Hearing Date _____



Diagrammatic sketch of typical injection well

TEXACO INC.
NEW MEXICO "R" STATE (NCT-3) NO. 20
VACUUM GRAYBURG-SAN ANDRES POOL
LEA COUNTY, NEW MEXICO

December 15, 1972

New Mexico Oil Conservation Commission
P.O. Box 2028
Santa Fe, New Mexico 87501

Attention: Mr. A. L. Porter, Jr.

Re: Proposed Well Locations
Texaco Vacuum Grayburg-San Andres
Pressure Maintenance Project
Lea County, New Mexico

Gentleman:

Texaco Inc. respectfully requests administrative approval to relocate six unorthodox well locations previously approved by Commission Order No. R-4442, dated November 27, 1972, for the referenced project. Fifteen unorthodox well locations were approved in the cited order but six of them cannot be drilled on the approved locations without Texaco undergoing an exorbitant amount of expense and time to remove and relocate existing man-made structures.

The attached tabulation of wells contains both the previously approved locations and the proposed locations requested by Texaco. A plat is also attached with the requested locations for the subject wells.

It is requested that the New Mexico 'M' State Well No. 12 be relocated 60 feet south and 50 feet west of the approved location due to an existing road and satellite station. Numerous flow lines and separator vessels would have to be moved and in turn would curtail production for many days. The New Mexico 'AC' State Well No. 14 location is also obstructed by a satellite station and would be more advantageously located 40 feet north and 100 feet east of the approved location. The New Mexico 'R' (NCT-3) State Well No. 22 and Well No. 23 locations are both within a hazardous distance to major electrical power lines. It is requested that Well No. 22 be relocated 120 feet north of its approved location and that Well No. 23 be relocated 110 feet north of its approved location to eliminate the electrical hazard. The approved location for the New Mexico 'R' (NCT-3) Well No. 18 will cover a U.S. Government Bench Mark, therefore, it is requested that the location be moved 20 feet east of the approved location. The New Mexico 'R' (NCT-3) Well No. 20 location is obstructed by a satellite station and Texaco requests that the location be relocated 110 feet west of the approved location. This proposed relocation will change the unit designation from 'O' to 'I' and is the only relocation that will change a unit designation. To relocate Well No. 20 in any direction other than the west would require a distance greater than 110 feet.

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-2-

December 15, 1972

All of the proration units in which the proposed well locations are located are offset by only Texaco proration units, therefore, no dividers will be required in the administrative approval of this application.

Texaco has initiated drilling operations on two of the other nine wells in the project as authorized in the cited order and the subject six wells will be drilled upon approval of the requested application.

It is therefore requested that administrative approval be granted for the six wells to prevent an exorbitant amount of expense and time to remove existing obstructions, to prevent a loss in production, and a disruption in the drilling schedule of these wells.

Your early cooperation in this matter will be appreciated.

Yours very truly,

(Sgd.) J. V. GANNON

J. V. Gannon
District Superintendent

KLP-dh

MASJr.

Mr. W.B. Kelly

Blind Note: Mr. Kelly: Please review this recommendation with Mr. A. L. Porter on December 18, 1972 and impress upon him the urgency of this application. Please call this office upon its approval.

SUMMARY OF WELL LOCATIONS

<u>Lease Name</u>	<u>Well No.</u>	<u>Section No.</u>	<u>Approved by Order No. R-4442</u>	<u>Requested Location</u>
New Mexico "H" State	12	1	1330' FNL & 2630' FWL	1390' FNL & 2580' FWL
New Mexico "AC" State (NCT-1)	14	2	1400' FSL & 2550' FSL	1440' FSL & 2450' FSL
New Mexico "R" (NCT-3) State 20	20	1	1310' FSL & 2630' FSL	1310' FSL & 2540' FWL
New Mexico "R" (NCT-3) State	23	1	100' FSL & 1420' FWL	210' FSL & 1420' FWL
New Mexico "R" (NCT-3) State	18	1	2630' FSL & 10' FWL	2630' FSL & 30' FWL
New Mexico "H" (NCT-3) State	22	1	100' FSL & 100' FWL	220' FSL & 100' FWL

TEXACO Inc.
LOCATION PLAT
TEXACO
VACUUM GRAYBURG SAN ANDRES
PRESSURE MAINTENANCE PROJECT
VACUUM GRAYBURG SAN ANDRES POOL
LEA COUNTY, NEW MEXICO
Scale: 1" = 1000'
KLP/FMR 12-15-72



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO
P. O. BOX 2088 - SANTA FE
87501

GOVERNOR
BRUCE KING
CHAIRMAN

LAND COMMISSIONER
ALEX J. ARMIJO
MEMBER

STATE GEOLOGIST
A. L. PORTER, JR.
SECRETARY-DIRECTOR

December 19, 1972

Texaco Inc.
Drawer 728
Hobbs, New Mexico 88240

Attention: Mr. J. V. Gannon

Re: Well Locations - Texas Vacuum Grayburg-
San Andres Pressure Maintenance Project

Gentlemen:

By application dated December 15, 1972, Texaco Inc. has requested approval to relocate six wells in the Texas Vacuum Grayburg-San Andres Unit because of the presence of man-made structure. Due to the expense that would be incurred to remove the structures, approval of the application is advisable; therefore in accordance with the provisions of Commission Order R-4442 said application is approved.

The requested new locations are listed below:

Lease Name	Well No.	Sec. No	Requested Location
New Mexico "M" State	12	1	1390' FNL & 2580' FWL
New Mexico "AC" State (NCT-1)	14	2	1400' FSL & 2450' FEL
New Mexico "R" (NCT-3) State	20	1	1310' FSL & 2540' FWL
New Mexico "R" (NCT-3) State	23	1	210' FSL & 1420' FWL
New Mexico "R" (NCT-3) State	18	1	2630' FSL & 30' FWL
New Mexico "R" (NCT-3) State	22	1	220' FSL & 100' FWL

All in Township 13 South, Range 34 East, NMPM, Lea County, New Mexico.

Very truly yours,

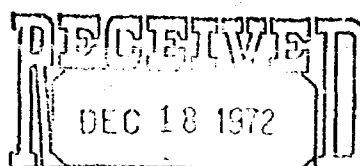
A. L. Porter, Jr.
A. L. PORTER, Jr.
Secretary-Director

ALP/JEK/og
cc: Oil Conservation Commission - Hobbs

*Please call collect
Texaco Hobbs when
approved.*



PETROLEUM PRODUCTS



TEXACO INC.
OIL CONSERVATION
DRAWING 728
SANTA FE, NEW MEXICO 88240

December 15, 1972

New Mexico Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. A. L. Porter, Jr.

Re: Proposed Well Locations
Texaco Vacuum Grayburg-San Andres
Pressure Maintenance Project
Lea County, New Mexico

*Revision to
14 by phone
Ken 12-19-72
RLS*

Gentlemen:

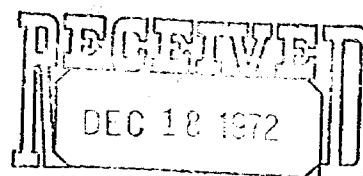
Texaco Inc. respectfully requests administrative approval to relocate six unorthodox well locations previously approved by Commission Order No. R-4442, dated November 27, 1972, for the referenced project. Fifteen unorthodox well locations were approved in the cited order but six of them cannot be drilled on the approved locations without Texaco undergoing an exorbitant amount of expense and time to remove and relocate existing man-made structures.

The attached tabulation of wells contains both the previously approved locations and the proposed locations requested by Texaco. A plat is also attached with the requested locations for the subject wells.

It is requested that the New Mexico 'M' State Well No. 12 be relocated 60 feet south and 50 feet west of the approved location due to an existing road and satellite station. Numerous flow lines and separator vessels would have to be moved and in turn would curtail production for many days. The New Mexico 'AC' State Well No. 14 location is also obstructed by a satellite station and would be more advantageously located ~~40 feet north and~~ 100 feet east of the approved location. The New Mexico 'R' (NCT-3) State Well No. 22 and Well No. 23 locations are both within a hazardous distance to major electrical power lines. It is requested that Well No. 22 be relocated 120 feet north of its approved location and that Well No. 23 be relocated 110 feet north of its approved location to eliminate the electrical hazard. The approved location for the New Mexico 'R' (NCT-3) Well No. 18 will cover a U.S. Government Bench Mark, therefore, it is requested that the location be moved 20 feet east of the approved location. The New Mexico 'R' (NCT-3) Well No. 20 location is obstructed by a satellite station and Texaco requests that the location be relocated 110 feet west of the approved location. This proposed relocation will change the unit designation from 'O' to 'I' and is the only relocation that will change a unit designation. To relocate Well No. 20 in any direction other than the west would require a distance greater than 110 feet.

NMOCC

-2-



OIL CONSERVATION COMM.
Santa Fe
December 15, 1972

All of the proration units in which the proposed well locations are located are offset by only Texaco proration units, therefore, no waivers will be required in the administrative approval of this application.

Texaco has initiated drilling operations on two of the other nine wells in the project as authorized in the cited order and the subject six wells will be drilled upon approval of the requested application.

It is therefore requested that administrative approval be granted for the six wells to prevent an exorbitant amount of expense and time to remove existing obstructions, to prevent a loss in production, and a disruption in the drilling schedule of these wells.

Your early cooperation in this matter will be appreciated.

Yours very truly,

J. V. Gannon
J. V. Gannon
District Superintendent

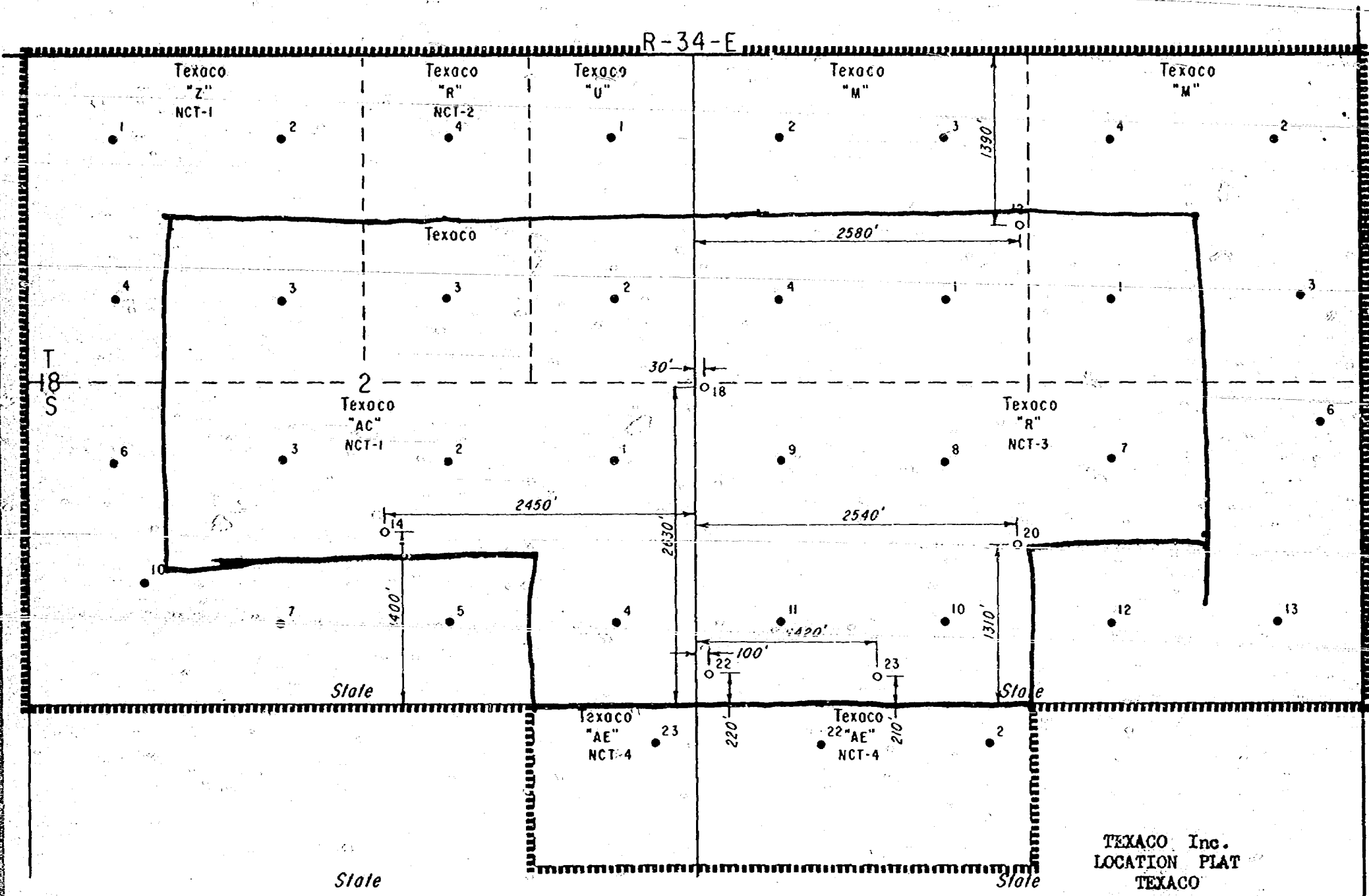
KLP-dh

MASJr.

Mr. W.B. Kelly

SUMMARY OF WELL LOCATIONS

<u>Lease Name</u>	<u>Well No.</u>	<u>Section No.</u>	<u>Approved by Order No. R-4442</u>	<u>Requested Location</u>
I New Mexico "M" State	12	1	1330' FNL & 2630' FWL	1390' FNL & 2580' FWL
I New Mexico "AC" State (NCT-1)	14	2	1400' FSL & 2550' FEL	¹⁴⁰⁰ 1440 ' FSL & 2450' FEL
I New Mexico "R" (NCT-3) State	20	1	1310' FSL & 2630' FEL	1310' FSL & 2540' FWL
I New Mexico "R" (NCT-3) State	23	1	100' FSL & 1420' FWL	210' FSL & 1420' FWL
P New Mexico "R" (NCT-3) State	18	1	2630' FSL & 10' FWL	2630' FSL & 30' FWL
P New Mexico "R" (NCT-3) State	22	1	100' FSL & 100' FWL	220' FSL & 100' FWL



..... BOUNDARY OF TEXACO'S VACUUM GRAYBURG SAN ANDRES UNIT

TEXACO Inc.
 LOCATION PLAT
 TEXACO
 VACUUM GRAYBURG SAN ANDRES
 PRESSURE MAINTENANCE PROJECT
 VACUUM GRAYBURG SAN ANDRES POOL
 LEA COUNTY, NEW MEXICO
 Scale: 1" = 1000'
 KLP/FMR 12-15-72

December 15, 1972

New Mexico Oil Conservation Commission
P.O. Box 2088
Santa Fe, New Mexico 87501

Attention: Mr. A. L. Porter, Jr.

Re: Proposed Well Locations
Texaco Vacuum Grayburg-San Andres
Pressure Maintenance Project
Lea County, New Mexico

Gentlemen:

Texaco Inc. respectfully requests administrative approval to relocate six unorthodox well locations previously approved by Commission Order No. R-4442, dated November 27, 1972, for the referenced project. Fifteen unorthodox well locations were approved in the cited order but six of them cannot be drilled on the approved locations without Texaco undergoing an exorbitant amount of expense and time to remove and relocate existing man-made structures.

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NHOCC

-2-

December 15, 1972

All of the proration units in which the proposed well locations are located are offset by only Texaco proration units, therefore, no waivers will be required in the administrative approval of this application.

Texaco has initiated drilling operations on two of the other nine wells in the project as authorized in the cited order and the subject six wells will be drilled upon approval of the requested application.

It is therefore requested that administrative approval be granted for the six wells to prevent an exorbitant amount of expense and time to remove existing obstructions, to prevent a loss in production, and a disruption in the drilling schedule of these wells.

Your early cooperation in this matter will be appreciated.

Yours very truly,

(Sgd.) J. V. GANNON

J. V. Gannon
District Superintendent

KLP-dh

HASJr.

Mr. W.B. Kelly

SUMMARY OF WELL LOCATIONS

<u>Lease Name</u>	<u>Well No.</u>	<u>Section No.</u>	<u>Approved by Order No. R-4442</u>	<u>Requested Location</u>
New Mexico "M" State	12	1	1330' FNL & 2630' FWL	1390' FNL & 2580' FWL
New Mexico "AC" State (NCT-1)	14	2	1400' FSL & 2550' FBL	1440' FSL & 2450' FBL
New Mexico "R" (NCT-3) State 20	20	1	1310' FSL & 2630' FBL	1310' FSL & 2540' FWL
New Mexico "R" (NCT-3) State	23	1	100' FSL & 1420' FWL	210' FSL & 1420' FWL
New Mexico "R" (NCT-3) State	18	1	2630' FSL & 10' FWL	2630' FSL & 30' FWL
New Mexico "R" (NCT-3) State	22	1	100' FSL & 100' FWL	220' FSL & 100' FWL

R-34-E

Texaco
"Z"
NCT-1

Texaco
"R"
NCT-2

Texaco
"U"

Texaco
"M"

Texaco
"M"

Texaco

Texaco
"AC"
NCT-1

Texaco
"R"
NCT-3

Texaco
"AE"
NCT-4

Texaco
22"AE"
NCT-4

TEXACO Inc.
LOCATION PLAT
TEXACO

VACUUM GRAYBURG SAN ANDRES
PRESSURE MAINTENANCE PROJECT
VACUUM GRAYBURG SAN ANDRES POOL
LEA COUNTY, NEW MEXICO

Scale: 1" = 1000'
KLP/FMR 12-15-72

..... BOUNDARY OF TEXACO'S VACUUM GRAYBURG SAN ANDRES UNIT

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UNIT AGREEMENT
FOR THE DEVELOPMENT AND OPERATION
OF THE
VACUUM GRAYBURG SAN ANDRES UNIT AREA
LEA COUNTY, NEW MEXICO

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OIL CONSERVATION COMMISSION	
EXHIBIT NO.	
CASE NO.	
Submitted By	
Heard Date	

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LEA COUNTY, NEW MEXICO

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UNIT AGREEMENT
FOR THE DEVELOPMENT AND OPERATION
OF THE
VACUUM GRAYBURG SAN ANDRES UNIT AREA
LEA COUNTY, NEW MEXICO
NO. _____

THIS AGREEMENT, entered into as of the 1st day of November, 1972, by and between the parties subscribing, ratifying or consenting hereto, and herein referred to as the "parties hereto,"

WITNESSETH:

WHEREAS, the parties hereto are the owners of working, royalty or other oil or gas interests in the unit area subject to this agreement; and

WHEREAS, the Commissioner of Public Lands of the State of New Mexico is authorized by an Act of the Legislature (Sec. 3, Chap. 88, Laws 1943) as amended by Sec. 1 of Chapter 162, Laws of 1951, (Chap. 7, Art. 11, Sec. 39, N.M. Statutes 1953 Annot.), to consent to and approve the development or operation of State Lands under agreements made by lessees of State land jointly or severally with other lessees where such agreements provide for the unit operation or development of part of or all of any oil or gas pool, field, or area; and

WHEREAS, the Commissioner of Public Lands of the State of New Mexico is authorized by an Act of the Legislature (Sec. 1, Chap. 162), (Laws of 1951, Chap. 7, Art. 11, Sec. 41 N. M. Statutes 1953 Annotated) to amend with the approval of lessee, evidenced by the lessee's execution of such agreement or otherwise, any oil and gas lease embracing State lands so that the length of the term of said lease may coincide with the term of such agreements for the unit operation and development of part or all of any oil or gas pool, field or area; and

WHEREAS, the Oil Conservation Commission of the State of New Mexico (Hereinafter referred to as the "Commission") is authorized by an Act of the Legislature (Chap. 72, Laws 1935; Chap. 65, Art. 3, Sec. 14 N.M. Statutes 1953 Annotated) to approve this agreement and the conservation provisions hereof; and

WHEREAS, the parties hereto hold sufficient interests in the Vacuum Grayburg San Andres Unit Area covering the land hereinafter described to give reasonably effective control of operations therein; and

WHEREAS, it is the purpose of the parties hereto to conserve natural resources, prevent waste and secure other benefits obtainable through development and operation of the area subject to this agreement under the terms, conditions and limitations herein set forth;

NOW, THEREFORE, in consideration of the premises and the promises herein contained, the parties hereto commit to this agreement their respective interests in the below defined Unit Area, and agree severally among themselves as follows:

ARTICLE 1
DEFINITIONS

As used in this agreement, the terms herein contained shall have the following meaning:

1.1 Commissioner means the Commissioner of Public Lands of the State of New Mexico.

1.2 Commission means the Oil Conservation Commission of the State of New Mexico.

1.3 Unit Area means the lands described by Tracts in Exhibit B and shown on Exhibit A as to which this agreement becomes effective or to which it may be extended as herein provided.

1.4 Unitized Formation is that zone interval including and correlative to portions of the Grayburg and San Andres Formations found between the depths of 3,902 feet (plus 105 feet sub-sea) and 4,809 feet (Minus 802 feet sub-sea) on the Wellex Acoustic Velocity Log, dated February 22, 1965, run in Texaco's New Mexico "M" State Well No. 8, located 330 feet from the north line and 1,880 feet from the west line of Section 1, T-18-S, R-34-E, Lea County, New Mexico.

1.5 Unitized Substances means all oil, gas, gaseous substances, sulphur contained in gas, condensate, distillate, and all associated and constituent liquid or liquefiable hydrocarbons within or produced from the Unitized Formation.

1.6 Working Interest means an interest in Unitized Substances by virtue of a lease, operating agreement, fee title, or otherwise, including a carried interest, which interest is chargeable with and obligated to pay or bear, either in cash or out of production or otherwise, all or a portion of the cost of drilling, developing, producing, and operating the Unitized Formation. Any interest in Unitized Substances which is a Working Interest as of the date the owner thereof executes or ratifies this Agreement shall thereafter be treated as a Working Interest for all purposes of this Agreement.

1.7 Working Interest Owner means a party hereto who owns a Working Interest. The owner of oil and gas rights that are free of lease or other instrument conveying the Working Interest to another shall be regarded as a Working Interest Owner to the extent of seven-eighths (7/8) of his interest in Unitized Substances, and as a Royalty Owner with respect to his remaining one-eighth (1/8) interest therein.

1.8 Royalty Interest means a right to or interest in any portion of the Unitized Substances or proceeds thereof other than a Working Interest.

1.9 Royalty Owner means a party hereto who owns a Royalty Interest.

1.10 Tract means each parcel of land described as such and given a Tract number in Exhibit B.

1.11 Unit Operating Agreement means the agreement entitled "Unit Operating Agreement; Vacuum Grayburg San Andres Unit, Lea County, New Mexico," that will be entered into between Working Interest Owners to be effective at the time and date that it is determined that the Working Interest is owned by more than one Working Interest Owner.

1.12 Unit Operator means the Working Interest Owner designated to develop and operate the Unitized Formation, acting as operator and not as a Working Interest Owner.

1.13 Tract Participation means the percentage shown on Exhibit B for allocating Unitized Substances to a Tract under this agreement.

1.14 Unit Participation of each Working Interest Owner means the sum of the percentages obtained by multiplying the Working Interest of such Working Interest Owner in each Tract by the Tract Participation of such Tract.

1.15 Outside Substances means all substances obtained from any source other than the Unitized Formation and which are injected into the Unitized Formation.

1.16 Oil and Gas Rights means the right to explore, develop, and operate lands within the Unit Area for the production of Unitized Substances, or to share in the production so obtained or the proceeds thereof.

1.17 Unit Operations means all operations conducted by Working Interest Owners or Unit Operator pursuant to this agreement and, if entered into, the Unit Operating Agreement, for or on account of the development and operation of the Unitized Formation for the production of Unitized Substances.

1.18 Unit Equipment means all personal property, lease and well equipment, plants, and other facilities and equipment taken over or otherwise acquired for the joint account for use in Unit Operations.

1.19 Unit Expense means all cost, expense, or indebtedness incurred by Working Interest Owners or Unit Operator pursuant to this agreement and the Unit Operating Agreement for or on account of Unit Operations.

1.20 Unless the context otherwise clearly indicates, words used in the singular include the plural, the plural include the singular, and the neuter gender include the masculine and the feminine.

ARTICLE 2 EXHIBITS

2.1 Exhibits. Attached hereto are the following exhibits which are incorporated herein by reference:

2.1.1 Exhibit A, which is a map that shows the boundary lines of the Unit Area and the Tracts therein.

2.1.2 Exhibit B, which is a schedule that describes each Tract in the Unit Area and shows its Tract Participation.

2.2 Reference to Exhibits. When reference herein is made to an exhibit, the reference is to the Exhibit as originally attached or, if revised, to the latest revision.

2.3 Exhibits Considered Correct. An exhibit shall be considered to be correct until revised as herein provided.

2.4 Correcting Errors. The shapes and descriptions of the respective Tracts have been established by using the best information available. If it subsequently appears that any Tract, because of diverse royalty or working interest ownership on the effective date hereof, should be divided into more than one Tract, or that any mechanical miscalculation has been made, Unit Operator, with the approval of Working Interest Owners, may correct the mistake by revising the exhibits to conform to the facts. The revision shall not include any re-evaluation of engineering or geological interpretations used in determining Tract Participation. Each such revision of an exhibit shall be effective at 7:00 a.m. on the first day of the calendar month next following the filing for record of the revised exhibit or on such other date as may be determined by Working Interest Owners and set forth in the revised exhibit.

2.5 Filing Revised Exhibits. If an exhibit is revised pursuant to this agreement, Unit Operator shall certify and file the revised exhibit with the Commissioner of Public Lands of the State of New Mexico for approval and for record in the County or Counties in which this agreement is filed.

ARTICLE 3 CREATION AND EFFECT OF UNIT

3.1 Oil and Gas Rights Unitized. Subject to the provisions of this agreement, all Oil and Gas Rights of Royalty Owners in and to the lands described in Exhibit B, and all Oil and Gas Rights of Working Interest Owners in and to said lands, are hereby unitized insofar as the respective Oil and Gas Rights pertain to the Unitized Formation, so that operations may be conducted as if the Unitized Formation had been included in a single lease executed by all Royalty Owners, as lessors, in favor of all Working Interest Owners, as lessees, and as if the lease had been subject to all of the provisions of this agreement.

3.2 Personal Property Excepted. All lease and well equipment, materials and other facilities heretofore or hereafter placed by any of the Working Interest Owners on the lands covered hereby shall be deemed to be and shall remain personal property belonging to and may be removed by the Working Interest Owners. The rights and interests therein as among Working Interest Owners are covered by the Unit Operating Agreement.

3.3 Amendment of Leases and Other Agreements. The provisions of the various leases, agreements, division and transfer orders, or other instruments covering the respective Tracts or the production therefrom are amended to the extent necessary to make them conform to the provisions of this agreement, but otherwise shall remain in effect.

3.4 Continuation of Leases and Term Royalties. Unit Operations conducted on any part of the Unit Area shall be considered with respect to leases and term royalties as follows:

3.4.1 Operations, including drilling operations, conducted with respect to the Unitized Formation on any part of the Unit Area, or production from any part of the Unitized Formation, except for the purpose of determining payments to Royalty Owners, shall be considered as operations upon or production from each Tract, and such operations or production shall continue in effect each lease or term royalty interest as to all lands covered thereby just as if such operations had been conducted and a well had been drilled on and was producing from each Tract.

3.4.2 Any lease embracing lands of the State of New Mexico which is made subject to this Agreement shall continue in force beyond the term provided therein as to the lands committed hereto until the termination hereof.

3.4.3 Any lease embracing lands of the State of New Mexico having only a portion of its land committed hereto, shall be segregated as to the portion committed and that portion not committed, and the terms of such lease shall apply separately as to such segregated portions commencing as of the effective date hereof. Notwithstanding any of the provisions of this agreement to the contrary, any lease embracing lands of the State of New Mexico having only a portion of its land committed hereto shall continue in full force and effect beyond the term provided therein as to all lands embraced in such lease (whether within or without the Unit Area), (i) if, and for so long as Unitized Substances are capable of being produced in paying quantities from some part of the lands embraced in such lease committed to this agreement, or (ii) if, and for so long as some part of the lands embraced in such State lease are allocated Unitized Substances; or (iii) if, at the expiration of the secondary term, the lessee or the Unit Operator is then engaged in bona fide drilling or reworking operations on some part of the lands embraced therein and for so long as such operations are being diligently prosecuted, and if they result in the production of Unitized Substances, said lease shall continue in full force and effect as to all of the lands embraced therein, as provided in (i) or (ii) above.

3.5 Titles Unaffected by Unitization. Nothing herein shall be construed to result in the transfer of title to the Oil and Gas Rights by any party hereto to any other party or to Unit Operator. The intention is to provide for the cooperative development and operation of the Tracts and for the sharing of Unitized Substances as herein provided.

3.6 Injection Rights. Royalty Owners hereby grant unto Working Interest Owners the right to inject into the Unitized Formation any substances in whatever amounts Working Interest Owners deem expedient for Unit Operations, including the right to drill and maintain injection wells on the Unit Area and to use producing or abandoned oil or gas wells for such purposes.

3.7 Development Obligation. Nothing herein shall relieve Working Interest Owners from the obligation to develop reasonably as a whole the lands and leases committed hereto.

3.8 Drainage. The Unit Operator shall take appropriate and adequate measures to prevent drainage of Unitized Substances from unitized land by wells on land not subject to this agreement.

ARTICLE 4
PLAN OF OPERATIONS

4.1 Unit Operator. Texaco Inc. is hereby designated as the initial Unit Operator and by signature hereto agrees and consents to accept the duties and obligations of Unit Operator for the operation, development, and production of Unitized Substances as herein provided. Whenever reference is made herein to the Unit Operator, such reference means the Unit Operator acting in that capacity and not as an owner of interests in Unitized Substances, and the term "Working Interest Owner" when used herein shall include or refer to Unit Operator as the owner of a Working Interest when such an interest is owned by it.

4.2 Resignation or Removal of Unit Operator. Unit Operator shall have the right to resign at any time, but such resignation shall not become effective so as to release Unit Operator from the duties and obligations of Unit Operator and terminate Unit Operator's rights as such unless a successor Unit Operator has been selected and approved in the manner provided for in Section 4.3 of this agreement. The resignation of the Unit Operator shall not release the Unit Operator from any liability or any default by it hereunder occurring prior to the effective date of its resignation.

The Unit Operator shall, upon default or failure in the performance of its duties or obligations hereunder, or for any other cause, be subject to removal by Working Interest Owners having in the aggregate seventy-five percent (75%) or more of the Unit Participation remaining after excluding the Unit Participation of the Unit Operator. Such removal shall be effective upon notice thereof to the Commissioner.

The resignation or removal of Unit Operator under this agreement shall not terminate its rights, title or interest as the owner of a Working Interest or other interest in Unitized Substances, but upon the resignation or removal of Unit Operator becoming effective, such Unit Operator shall deliver possession of all equipment, books, and records, materials, appurtenances and any other assets, used in connection with the unit operations and owned by the Working Interest Owners to the new duly qualified successor Unit Operator or to the owners thereof if no such new Unit Operator is elected, to be used for the purpose of conducting unit operations hereunder. Nothing herein shall be construed as authorizing the removal of any material, equipment and appurtenances needed for the preservation of any wells.

4.3 Successor Unit Operator. Whenever the Unit Operator shall tender its resignation as Unit Operator or shall be removed as hereinbefore provided, the Working Interest Owners shall select a successor Unit Operator as herein provided. Such selection shall not become effective until (a) a Unit Operator so selected shall accept in writing the duties and responsibilities of Unit Operator, and (b) the selection shall have been filed with and approved by the Commissioner. If no successor Unit Operator is selected and qualified as herein provided, the Commissioner, at his election, may declare this agreement terminated.

In selecting a successor Unit Operator the affirmative vote of two or more Working Interest Owners owning a total of sixty-five percent (65%) or more of the Unit Participation shall prevail, provided that if any one Working Interest Owner has a Unit Participation of more than thirty-five percent (35%), its negative vote or failure to vote shall not be regarded as sufficient unless supported by the vote of one (1) or more Working Interest Owners having a combined Unit Participation of at least five percent (5%). If the Unit Operator who is removed votes only to succeed itself or fails to vote, the successor Unit Operator may be selected by the affirmative vote of Working Interest Owners owning a total of at least fifty-one percent (51%) of the Unit Participation remaining after excluding the Unit Participation of Unit Operator so removed.

4.4 Plan of Operations. It is recognized and agreed by the parties hereto that all of the land subject to this Agreement is reasonably proved to be productive of Unitized Substances in paying quantities and that the object and purpose of this Agreement is to formulate and to put into effect a secondary recovery project in order to effect additional recovery of Unitized Substances, prevent waste and conserve natural resources. The parties hereto agree that the Unit Operator may, subject to the consent and approval of a plan of operation by

the Working Interest Owners, Commissioner and the Commission, inject into the Unitized Formation, through any well or wells completed therein, brine, water, air, gas, oil and any one or more other substances or combination of substances, whether produced from the Unitized Formation or not, and that the location of input wells and the rates of injection therein and the rate of production shall be governed by standards of good geologic and petroleum engineering practices and conservation methods. After commencement of secondary operations, Unit Operator shall furnish the Commissioner with monthly injection and production reports for each well in the Unit. The Working Interest Owners and the Commissioner shall be furnished periodic reports on the progress of the plan of operation and any revisions or changes thereto necessary to meet changed conditions or to protect the interests of all parties to this Agreement, which revisions and changes shall be subject to approval by the Commission and the Commissioner. Subject to like approval the Plan of Operation may be revised as conditions may warrant.

The initial plan of operation shall be filed for approval with the Commissioner and the Commission concurrently with the filing of this Unit Agreement for final approval. Said initial plan of operation and all revisions thereof shall be as complete and adequate as the Commissioner and the Commission may determine to be necessary for timely operation consistent herewith. Reasonable diligence shall be exercised in complying with the obligations of the approved plan of operation. Thereafter, from time to time before the expiration of any existing plan, the Unit Operator shall submit for like approval a plan for an additional specified period of operation.

4.5 Accounting Provisions and Unit Operating Agreement. Costs and expenses incurred by Unit Operator in conducting Unit Operations hereunder shall be paid, apportioned among and borne by the Working Interest Owners in accordance with the Unit Operating Agreement. Such Unit Operating Agreement shall also provide the manner in which the Working Interest Owners shall be entitled to receive their respective proportionate and allocated share of the benefits accruing hereto in conformity with their underlying operating agreements, leases or other independent contracts and such other rights and obligations as between Unit Operator and the Working Interest Owners as may be agreed upon by the Unit Operator and the Working Interest Owners; however, no such Unit Operating Agreement shall be deemed either to modify any of the terms and conditions of this Unit Agreement or to relieve the Unit Operator of any right or obligation established under this Agreement, and in case of any inconsistency or conflict between this Agreement and the Unit Operating Agreement, this Unit Agreement shall prevail. Two true copies of any Unit Operating Agreement executed pursuant to this Section shall be filed with the Commissioner.

4.6 Rights and Obligations of Unit Operator. Except as otherwise specifically provided herein, the exclusive right, privilege and duty of exercising any and all rights of the parties hereto which are necessary or convenient for prospecting for, producing, storing, allocating and distributing the Unitized Substances are hereby delegated to and shall be exercised by the Unit Operator as herein provided. Upon request acceptable evidence of title to said rights shall be deposited with said Unit Operator, and together with this Agreement, shall constitute and define the rights, privileges and obligations of Unit Operator. Nothing herein, however, shall be construed to transfer title to any land or to any lease or Operating Agreement, it being understood that under this Agreement the Unit Operator, in its capacity as Unit Operator, shall exercise the rights of possession and use vested in the parties hereto only for the purposes herein specified.

ARTICLE 5 EASEMENTS OR USE OF SURFACE

5.1 Grant of Easements. The parties hereto, to the extent of their rights and interest, hereby grant to Working Interest Owners the right to use as much of the surface of the land within the Unit Area as may reasonably be necessary for unit operations, including the free use of water from the Unit Area for unit operations, insofar as such rights are granted by the oil and gas leases.

ARTICLE 6
TRACT PARTICIPATION

6.1 Tract Participation. The Tract Participations of each Tract are shown in Exhibit "B", and have been computed in accordance with the following:

Tract Participation Percentage,
equals
percentage of acre feet of Grayburg
San Andres productive oil bearing
formation underlying each tract within
the Unit Area, as shown in Exhibit "A".

6.2 Adjustment for Committed Tracts. If less than all Tracts within the Unit Area are committed as of the Effective Date of this agreement, Unit Operator, as soon as practicable thereafter, shall file with the Commissioner schedules of committed Tracts as of said Effective Date, which said schedules shall be designated "Revised Exhibit A", and "Revised Exhibit B", and shall be considered for all purposes as a part of this agreement. Such Revised Exhibit "B" shall set forth opposite each such committed Tract the revised Tract Participation therefor which shall be calculated by using the same Tract factors and formulas that were used to arrive at the Tract Participations of each Tract as set out in Original Exhibit "B" attached hereto, by applying the same only to the committed Tracts. Such revised Exhibits shall supersede, effective as of the effective date hereof, the Tract Participations set forth in Exhibit "B" attached hereto until a further revision or revisions thereof is approved by the Commissioner. The Tract Participations shown on Exhibit "B" attached hereto, or as may be shown on revised Exhibit "B" as above provided, shall govern the allocation of Unitized Substances on and after the effective date of this Unit Agreement, as set forth in Section 17 hereof, and until the allocation schedule is revised pursuant to this agreement.

6.3 Relative Tract Participations. If the Unit Area is enlarged or reduced, the revised Tract Participations of the Tracts remaining in the Unit Area and which were within the Unit Area prior to the enlargement or reduction shall remain in the same ratio one to another.

ARTICLE 7
ALLOCATION OF UNITIZED SUBSTANCES

7.1 Allocation to Tracts. All Unitized Substances produced and saved (less and except any part of such Unitized Substances used in conformity with good operating practices as concerns the Unitized Formation on Unitized land for drilling, operating, camp, and other production or development purposes and for pressure maintenance or unavoidable loss) shall be allocated to the several Tracts in accordance with the respective Tract Participations. The amount of Unitized Substances allocated to each Tract, regardless of whether it is more or less than the actual production of Unitized Substances from the well or wells, if any, on such Tract, shall be deemed for all purposes to have been produced from such Tract.

7.2 Distribution Within Tracts. The Unitized Substances allocated to each Tract shall be distributed among, or accounted for to, the parties entitled to share in the production from such Tract in the same manner, in the same proportions, and upon the same conditions as they would have participated and shared in the production from such Tract, or in the proceeds thereof, had this agreement not been entered into, and with the same legal effect. If any Oil and Gas Rights in a Tract hereafter become divided and owned in severalty as to different parts of the Tract, the owners of the divided interests, in the absence of an agreement providing for a different division, shall share in the Unitized Substances allocated to the Tract, or in the proceeds thereof, in proportion to the surface acreage of their respective parts of the Tract.

No Tract committed to this Agreement and qualified for participation shall be subsequently excluded from participation hereunder because of depletion of Unitized Substances, and nothing herein shall be construed as requiring any retroactive adjustment for production obtained prior to the effective date of the joinder of any Tract.

7.3 Taking Unitized Substances in Kind. The Unitized Substances allocated to each Tract shall be delivered in kind to the respective parties entitled thereto by virtue of the ownership of Oil and Gas Rights therein or by purchase from such owners. Such parties shall have the right to construct, maintain, and operate within the Unit Area all necessary facilities for that purpose, provided that they are so constructed, maintained, and operated as not to interfere with Unit Operations. Any extra expenditures incurred by Unit Operator by reason of the delivery in kind of any portion of the Unitized Substances shall be borne by the receiving party. If a Royalty Owner has the right to take in kind a share of Unitized Substances and fails to do so, the Working Interest Owner whose Working Interest is subject to such Royalty Interest shall be entitled to take in kind such share of the Unitized Substances.

7.4 Failure to Take in Kind. In the event any Working Interest Owner shall fail to take or otherwise adequately dispose of its proportionate share of the production from the Unitized Formation currently as and when produced, then so long as such condition continues, Unit Operator, for the account and at the expense of the Working Interest Owner of the Tract or Tracts concerned, and in order to avoid curtailing the operation of the Unit Area, may sell or otherwise dispose of such production to itself or to others on a day-to-day basis at not less than the prevailing market price in the area for like production, and the account of such Working Interest Owner shall be charged therewith as having received such production. The net proceeds, if any, of the Unitized Substances so disposed of by Unit Operator shall be paid to the Working Interest Owner of the Tract or Tracts concerned. Notwithstanding the foregoing, Unit Operator shall not make a sale into interstate commerce of any Working Interest Owner's share of gas production without first giving such Working Interest Owner sixty (60) days' notice of such intended sale.

Any party receiving in kind or separately disposing of all or any part of the Unitized Substances allocated to any Tract, or receiving the proceeds therefrom if the same is sold or purchased by Unit Operator, shall be responsible for the payment of all Royalty due under the lease or leases covering the Tracts contributed by it and received into the Unit, and each such party shall hold each other party hereto harmless against all claims, demands and causes of action for such Royalty on the lease or leases and Tracts contributed by it to the Unit Area.

7.5 Royalty Settlement. The State of New Mexico and all Royalty Owners who, under an existing contract, are entitled to take in kind a share of the substances produced from any tract unitized hereunder, shall continue to be entitled to such right to take in kind their share of the Unitized Substances allocated to such tract, and Unit Operator shall make deliveries of such Royalty share taken in kind in conformity with the applicable contracts, laws and regulations. Settlement for Royalty Interest not taken in kind shall be made by Working Interest Owners responsible therefor under existing contracts, laws and regulations, on or before the last day of each month for Unitized Substances produced during the preceding calendar month; provided, however, that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any Royalty due under their leases, except that such Royalty shall be computed in accordance with the terms of this Unit Agreement.

If the amount of production or the proceeds thereof accruing to any Royalty Owner in a tract depends upon the average production per well or the average pipeline run per well from such tract during any period of time, then such production shall be determined from and after the effective date hereof by dividing the quantity of Unitized Substances allocated hereunder to such tract during such period of time by the number of wells located thereon capable of producing Unitized Substances as of the effective date hereof.

All Royalty due the State of New Mexico and the other Royalty Owners hereunder shall be computed and paid on the basis of all Unitized Substances allocated to the respective tract or tracts committed hereto, in lieu of actual production from such tract or tracts.

7.6 Responsibility for Royalty Settlements. Any party receiving in kind or separately disposing of all or part of the Unitized Substances allocated to any Tract or receiving the proceeds therefrom shall be responsible for the payment thereof to the persons entitled thereto, and shall indemnify all parties hereto, including Unit Operator, against any liability for all royalties, overriding royalties, production payments, and all other payments chargeable against or payable out of such Unitized Substances or the proceeds therefrom.

7.7 Royalty On Outside Substances. If any Outside Substances, consisting of natural gases, are injected into the Unitized Formation, fifty percent (50%) of any like substances contained in Unitized Substances subsequently produced and sold, or used for other than operations hereunder, shall be deemed to be Outside Substances until the aggregate of said fifty percent (50%) equals the accumulated volume of such natural gases injected into the Unitized Formation. If the Outside Substances injected be liquefied petroleum gases, or other hydrocarbons, as distinguished from natural gases then, beginning one (1) year after injection of such liquefied petroleum gases or other liquid hydrocarbons is commenced, ten percent (10%) of all Unitized Substances produced and sold from the Unitized Formation shall be deemed to be Outside Substances until the aggregate value of said ten percent (10%) equals the entire accumulated cost to the Working Interest Owners of such liquefied petroleum gases or other liquid hydrocarbons injected. No payments shall be due or payable to Royalty Owners on any substance which is classified hereby as an Outside Substance.

7.8 Rental Settlement. Rentals or minimum royalties due on leases committed hereto shall be paid by Working Interest Owners responsible therefor under existing contracts, laws and regulations, provided that nothing herein contained shall operate to relieve the lessees of any land from their respective lease obligations for the payment of any rental or minimum royalty in lieu thereof, due under their leases. Rental for lands of the State of New Mexico subject to this Agreement shall be paid at the rate specified in the respective leases from the State of New Mexico.

ARTICLE 8 PRODUCTION AS OF THE EFFECTIVE DATE

8.1 Oil in Lease Tanks. Unit Operator shall gauge all lease and other tanks within the Unit Area to ascertain the amount of merchantable oil produced from the Unitized Formation in such tanks, above the pipe line connections, as of 7:00 a.m. on the effective date hereof. The oil that is a part of the prior allowable of the wells from which it was produced shall remain the property of the parties entitled thereto the same as if the Unit had not been formed. Any such oil not promptly removed may be sold by the Unit Operator for the account of the parties entitled thereto, subject to the payment of all royalties, overriding royalties, production payments, and all other payments under the provisions of the applicable lease or other contracts. The oil that is in excess of the prior allowable of the wells from which it was produced shall be regarded as Unitized Substances produced after the effective date hereof.

8.2 Overproduction. If, as of the effective date hereof, any Tract is overproduced with respect to the allowable of the wells on that Tract and the amount of overproduction has been sold or otherwise disposed of, such overproduction shall be regarded as a part of the Unitized Substances produced after the effective date hereof and shall be charged to such Tract as having been delivered to the parties entitled to Unitized Substances allocated to such Tract.

ARTICLE 9 USE OR LOSS OF UNITIZED SUBSTANCES

9.1 Use of Unitized Substances. Working Interest Owners may use as much of the Unitized Substances as they deem necessary for Unit Operations, including but not limited to the injection thereof into the Unitized Formation.

9.2 Royalty Payments. No royalty, overriding royalty, production or other payments shall be payable upon, or with respect to, Unitized Substances used or consumed in Unit Operations, or which otherwise may be lost or consumed in the production, handling, treating, transportation, or storing of Unitized Substances.

ARTICLE 10
TRACTS TO BE INCLUDED IN UNIT

10.1 Qualification of Tracts. On and after the effective date hereof and until the enlargement or reduction thereof, the Tracts within the Unit Area which shall be entitled to participate in the production of Unitized Substances therefrom shall be those Tracts listed in Exhibit "R" that corner or have a common boundary (Tracts separated only by a public highway or a railroad right of way shall be considered to have a common boundary), and that otherwise qualify as follows:

10.1.1 Each Tract as to which Working Interest Owners owning one hundred percent (100%) of the Working Interest have become parties to this agreement and as to which Royalty Owners owning seventy five percent (75%) or more of the Royalty Interest have become parties to this agreement.

10.1.2 Each Tract as to which Working Interest Owners owning one hundred percent (100%) of the Working Interest have become parties to this agreement, and as to which Royalty Owners owning less than seventy five percent (75%) of the Royalty Interest have become parties to this agreement, and as to which (a) all Working Interest Owners in such Tract have joined in a request for the inclusion of such Tract in the Unit Area, and as to which (b) eighty five percent (85%) of the combined voting interests of Working Interest Owners in all Tracts that meet the requirements of Section 10.1.1 have voted in favor of the inclusion of such Tract. For the purpose of this Section 10.1.2, the voting interest of a Working Interest Owner shall be equal to the ratio that its Unit Participation attributable to Tracts that qualify under Section 10.1.1 bears to the total Unit Participation of all Working Interest Owners attributable to all Tracts that qualify under Section 10.1.1.

10.1.3 Each Tract as to which Working Interest Owners owning less than one hundred percent (100%) of the Working Interest have become parties to this agreement, regardless of the percentage of Royalty Interest therein that is committed hereto; and as to which (a) the Working Interest Owner who operates the Tract and all of the other Working Interest Owners in such Tract who have become parties to this agreement have joined in a request for inclusion of such Tract in the Unit Area, and have executed and delivered an indemnity agreement agreeing to indemnify and hold harmless the other Working Interest Owners in the Unit Area, their successors and assigns, against all claims and demands that may be made by the owners of Working Interests in such Tract who are not parties to this agreement, and which arise out of the inclusion of the Tract in the Unit Area; and as to which (b) eighty five percent (85%) of the combined voting interest of Working Interest Owners in all Tracts that meet the requirements of Section 10.1.1 and 10.1.2 have voted in favor of the inclusion of such Tract and to accept the indemnity agreement. For the purpose of this Section 10.1.3, the voting interest of each Working Interest Owner shall be equal to the ratio that its Unit Participation attributable to Tracts that qualify under Sections 10.1.1 and 10.1.2 bears to the total Unit Participation of all Working Interest Owners attributable to all Tracts that qualify under Sections 10.1.1 and 10.1.2. Upon the inclusion of such a Tract in the Unit Area, the Unit Participation that would have been attributed to the nonsubscribing owners of the Working Interest in such Tract, had they become parties to this agreement and the Unit Operating Agreement, shall be attributed to the Working Interest Owners in such Tract who have become parties to such agreements, in proportion to their respective Working Interest in the Tract.

10.2 No Joinder Unless Tract Qualified. As the objective of this Unit Agreement is to have lands in the Unit Area operated and entitled to participation under the terms hereof, it is agreed that, notwithstanding anything else herein, no joinder shall be considered a commitment to this Unit Agreement unless the tract involved is qualified under Article 10 hereof.

ARTICLE 11
TITLES

11.1 Removal of Tract from Unit Area. If a Tract ceases to have sufficient Working Interest Owners or Royalty Owners committed to this agreement to meet the conditions of Article 10 because of failure of title of any party hereto, such Tract shall be removed from the Unit Area effective as of the first day of the calendar month in which the failure of title is finally determined; however, the Tract shall not be removed from the Unit Area if, within ninety (90) days of the date of final determination of the failure of title, the Tract requalifies under a Section of Article 10.

11.2 Revision of Exhibits. If a Tract is removed from the Unit Area because of the failure of title, Unit Operator, subject to Section 6.3, shall recompute the Tract Participation of each of the Tracts remaining in the Unit Area and shall revise Exhibits "A" and "B" accordingly. The revised exhibits shall be effective as of the first day of the calendar month in which such failure of title is finally determined.

11.3 Working Interest Titles. If title to a Working Interest fails, the rights and obligations of Working Interest Owners by reason of the failure of title shall be governed by the Unit Operating Agreement.

11.4 Royalty Owner Titles. If title to a Royalty Interest fails, but the Tract to which it relates is not removed from the Unit Area, the party whose title failed shall not be entitled to share hereunder with respect to such interest.

11.5 Production Where Title is in Dispute. In the event of a dispute as to title as to any royalty, working interest or other interest subject hereto, payment or delivery on account thereof may be withheld without liability or interest until the dispute is finally settled; provided, that as to State leases, no payments of funds due the State of New Mexico shall be withheld, but such funds shall be deposited as directed by the Commissioner, to be held as unearned money pending final settlement of the title dispute, and then applied as earned or returned in accordance with such final settlement.

Unit Operator as such is relieved from any responsibility for any defect or failure of any title hereunder.

11.6 Conflict of Supervision. Neither the Unit Operator nor the Working Interest Owners, nor any of them, shall be subject to any forfeiture, termination or expiration of any rights hereunder or under any leases or contracts subject hereto, or to any penalty or liability on account of delay or failure in whole or in part to comply with any applicable provisions thereof to the extent that the said Unit Operator or the Working Interest Owners, or any of them, are hindered, delayed or prevented from complying therewith by reason of failure of the Unit Operator to obtain, in the exercise of due diligence, the concurrence of proper representatives of the United States and proper representatives of the State of New Mexico in and about any matters or things concerning which it is required herein that such concurrence be obtained. The parties hereto and the Commission agree that all powers and authority vested in the Commission in and by any provisions of this agreement are vested in the Commission and shall be exercised by it pursuant to the provisions of the laws of the State of New Mexico and subject in any case to appeal or judicial review as may now or hereafter be provided by the laws of the State of New Mexico.

ARTICLE 12
ENLARGEMENTS OF UNIT AREA

12.1 Enlargements of Unit Area. The Unit Area may when practicable be enlarged to include therein any additional tract or tracts regarded as reasonably necessary or advisable for the purposes of this Agreement. Such enlargement shall be effected in the following manner:

(a) The Working Interest Owners of a tract or tracts desiring to bring such tract or tracts into this Unit, shall file an application therefor with Unit Operator requesting such admission.

(b) Unit Operator shall circulate a notice to each Working Interest Owner of the proposed enlargement, setting out the basis for admission, the Tract participation to be assigned to such Tract or Tracts, and other pertinent data. After negotiation (at Working Interest Owners' meeting or otherwise), if Working Interest Owners having in the aggregate at least eighty-five percent (85%) Unit Participation have agreed to such Tract or Tracts being brought into the Unit, then Unit Operator shall:

(1) After preliminary concurrence by the Commissioner prepare a notice of proposed enlargement describing the contemplated changes in the boundaries of the Unit Area, the reason therefor, the basis for admission of the additional tract or tracts, the Participations to be assigned thereto and the proposed effective date thereof; and

(2) Deliver copies of said notice to the Commissioner, each Working Interest Owner and to the lessee and lessor whose interests are affected, advising such parties that thirty (30) days will be allowed for submission to the Unit Operator of any objection to such proposed expansion; and

(3) File, upon the expiration of said thirty (30) day period as set out in (2) immediately above, with the Commissioner, the following: (a) Evidence of mailing or delivering copies of said notice of enlargement; (b) An application for such enlargement; (c) An instrument containing the appropriate joinders reflecting the qualifications of the new tract in the same manner required for the qualification of tracts under Section 10 hereof; and (d) Copies of any objections received.

The enlargement shall, after due consideration of all pertinent information and approval by the Commissioner and the Commission become effective as of the date prescribed in the notice thereof, preferably the first day of a month subsequent to the date of notice or on such other date as set by the Commissioner and the Commission in the order or instrument approving such enlargement. In any approved enlargement of the Unit Area, the revised Tract Participations of those Tracts which were committed prior to each such enlargement shall remain in the same ratio one to another.

ARTICLE 13 CHANGE OF TITLE

13.1 Covenant Running With the Land. This agreement shall extend to, be binding upon, and inure to the benefit of, the respective heirs, devisees, legal representatives, successors, and assigns of the parties hereto, and shall constitute a covenant running with the lands, leases, and interests covered hereby.

13.2 Notice of Transfer. Any conveyance of all or any part of any interest owned by any party hereto with respect to any Tract shall be made expressly subject to this agreement. No change of title shall be binding on the Unit Operator, or upon any party hereto other than the party so transferring, until the first day of the calendar month next succeeding the date of receipt by Unit Operator of a photocopy or a certified copy of the recorded instrument evidencing such change in ownership.

13.3 Waiver of Rights to Partition. Each party hereto covenants that during the existence of this agreement, it will not resort to any action to partition the Unit Area or the Unit Equipment, and to that extent waives the benefits of all laws authorizing such partition.

ARTICLE 14 RELATIONSHIP OF PARTIES

14.1 No Partnership. The duties, obligations, and liabilities of the parties hereto are intended to be several and not joint or collective. This agreement is not intended to create, and shall not be construed to create, an

association or trust, or to impose a partnership duty, obligation, or liability with regard to any one or more of the parties hereto. Each party hereto shall be individually responsible for its own obligations as herein provided.

14.2 No Sharing of Market. This agreement is not intended to provide, and shall not be construed to provide, directly or indirectly, for any cooperative refining, joint sale, or marketing of Unitized Substances.

14.3 Royalty Owners Free of Costs. This agreement is not intended to impose, and shall not be construed to impose, upon any Royalty Owner any obligation to pay for Unit Expense unless such Royalty Owner is otherwise so obligated.

14.4 Information to Royalty Owners. Each Royalty Owner upon written request therefor shall be entitled to all information in possession of Unit Operator to which such Royalty Owner is entitled by an existing agreement with any Working Interest Owner.

14.5 Appearances. Unit Operator shall, after notice to the other parties affected, have the right to appear for or on behalf of any and all interests affected hereby before the Commissioner and the Commission, and to appeal from any order issued under the rules and regulations of the Commissioner or the Commission, or to apply for relief from any of said rules and regulations or in any proceedings relative to operations before the Commissioner or the Commission or any other legally constituted authority; provided, however, that any other interested party shall also have the right at his or its own expense to be heard in any such proceeding.

14.6 Notices. All notices, demands, objections or statements required hereunder to be given or rendered to the parties hereto shall be deemed fully given if made in writing and personally delivered to the party or parties or sent by postpaid certified mail, addressed to such party or parties at their respective addresses set forth in connection with the signatures hereto or to the ratification or consent hereof or to such other address as any such party or parties may have furnished in writing to the party sending the notice, demand or statement.

14.7 No Waiver of Certain Rights. Nothing in this agreement contained shall be construed as a waiver by any party hereto of the right to assert any legal or constitutional right or defense as to the validity or invalidity of any law of the United States or of the State of New Mexico or rules or regulations issued thereunder in any way affecting such party, or as a waiver by any such party of any right beyond his or its authority to waive.

ARTICLE 15 LAWS AND REGULATIONS

15.1 Laws and Regulations. This agreement shall be subject to the conservation laws of the State of New Mexico; to the valid rules, regulations, and orders of the Oil Conservation Commission of New Mexico; and to all other applicable federal, state, and municipal laws, rules, regulations, and orders.

ARTICLE 16 FORCE MAJEURE

16.1 Force Majeure. All obligations imposed by this agreement on each party, except for the payment of money, shall be suspended while compliance is prevented, in whole or in part, by a strike, fire, war, civil disturbance, act of God; by federal, state, or municipal laws; by any rule, regulation, or other cause or causes beyond reasonable control of the party. No party shall be required against its will to adjust or settle any labor dispute. Neither this agreement nor any lease or other instrument subject hereto shall be terminated by reason of suspension of Unit Operations due to any one or more of the causes set forth in this Article.

ARTICLE 17 EFFECTIVE DATE

17.1 Effective Date. This Agreement shall become binding upon each party who executes or ratifies it as of the date of execution or ratification.

by such party and, unless sooner terminated as herein provided, shall become effective as of 7:00 o'clock a.m. of the first day of the calendar month next following:

17.1.1 The execution or ratification of this Agreement by Working Interest Owners owning a combined Unit Participation of at least eighty-five percent (85%), and the execution or ratification of the Agreement by Royalty Owners owning a combined interest of at least sixty-five percent (65%) of the Royalty Interest, in said Unit Area; and

17.1.2 The approval of this Agreement by the Commissioner and the Commission; and

17.1.3 The filing of at least one counterpart of this Agreement for record in the office of the County Clerk of Lea County, New Mexico, by the Unit Operator; and provided, further, that if the requirements of Section 17.1 are not accomplished on or before June 1, 1973, this Agreement shall ipso facto expire on said date (hereinafter called "expiration date") and thereafter be of no further force or effect, unless prior thereto this Agreement has been executed or ratified by Working Interest Owners owning a combined Unit Participation of at least seventy-five (75%), and the Working Interest Owners owning a combined Unit Participation of at least sixty-five percent (65%) committed to this Agreement have decided to extend said expiration date for a period not to exceed twelve (12) months (hereinafter called "extended expiration date"). If said expiration date is so extended and the requirements of Section 17.1 are not accomplished on or before said extended expiration date, this Agreement shall ipso facto expire on said extended expiration date and thereafter be of no further force and effect.

17.2 Certificate of Effectiveness. Unit Operator shall, within thirty (30) days after the effective date of this Agreement, file for record in the office where a counterpart of this Agreement is recorded, a certificate to the effect that this Agreement has become effective according to its terms and stating further the effective date.

ARTICLE 18 TERM

18.1 Term. The term of this agreement shall be for the time that Unitized Substances are produced in paying quantities and as long thereafter as Unit Operations are conducted without a cessation of more than one hundred eighty (180) consecutive days, unless sooner terminated by Working Interest Owners in the manner herein provided.

18.2 Termination by Working Interest Owners. This agreement may be terminated by Working Interest Owners having a combined Unit Participation of at least eighty five percent (85%) whenever such Working Interest Owners determine that Unit Operations are no longer profitable or feasible.

18.3 Effect of Termination. Upon termination of this agreement, the further development and operation of the Unitized Formation as a unit shall be abandoned, Unit Operations shall cease, and thereafter the parties shall be governed by the provisions of the leases and other instruments affecting the separate Tracts.

18.4 Salvaging Equipment Upon Termination. If not otherwise granted by the leases or other instruments affecting each Tract unitized under this agreement, Royalty Owners hereby grant Working Interest Owners a period of six (6) months after the date of termination of this agreement within which to salvage and remove Unit Equipment.

ARTICLE 19
EXECUTION

19.1 Original, Counterpart, or Other Instrument. A person may become a party to this agreement by signing the original of this instrument, a counterpart thereof, or other instrument agreeing to be bound by the provisions hereof. The signing of any such instrument shall have the same effect as if all the parties had signed the same instrument.

19.2 Joinder in Dual Capacity. Execution as herein provided by any party as either a Working Interest Owner or a Royalty Owner shall commit all interests that may be owned or controlled by such party.

ARTICLE 20
GENERAL

20.1 Amendments Affecting Working Interest Owners. Amendments hereto relating wholly to Working Interest Owners may be made if signed by all Working Interest Owners.

20.2 Border Agreements. Subject to the approval of the Commissioner and Working Interest Owners, the Unit Operator may enter into a border protection agreement or agreements with the Operators of adjacent lands along the boundaries of the Unit Area with respect to the operations in the border area for the maximum ultimate recovery, conservation purposes and proper protection of the parties and interests.

20.3 Action by Working Interest Owners. Any action or approval required by Working Interest Owners hereunder shall be in accordance with the provisions of the Unit Operating Agreement.

20.4 Lien of Unit Operator. Unit Operator shall have a lien upon the interests of Working Interest Owners in the Unit Area to the extent provided in the Unit Operating Agreement.

20.5 Creation of New Interest. If any Working Interest Owner shall, after executing this agreement, create any overriding royalty, production payment, or net profits or carried interest, or other similar interest, hereafter referred to as "New Interest", out of its interest subject to this agreement, such New Interest shall be subject to all the terms and provisions of this agreement and to the Lien of Unit Operator as provided in the Unit Operating Agreement.

IN WITNESS WHEREOF, The parties hereto have executed this agreement on the dates opposite their respective signatures.

APPROVED AS TO
Terms MS
Form RMS

TEXACO INC.

DATE: October 26, 1982

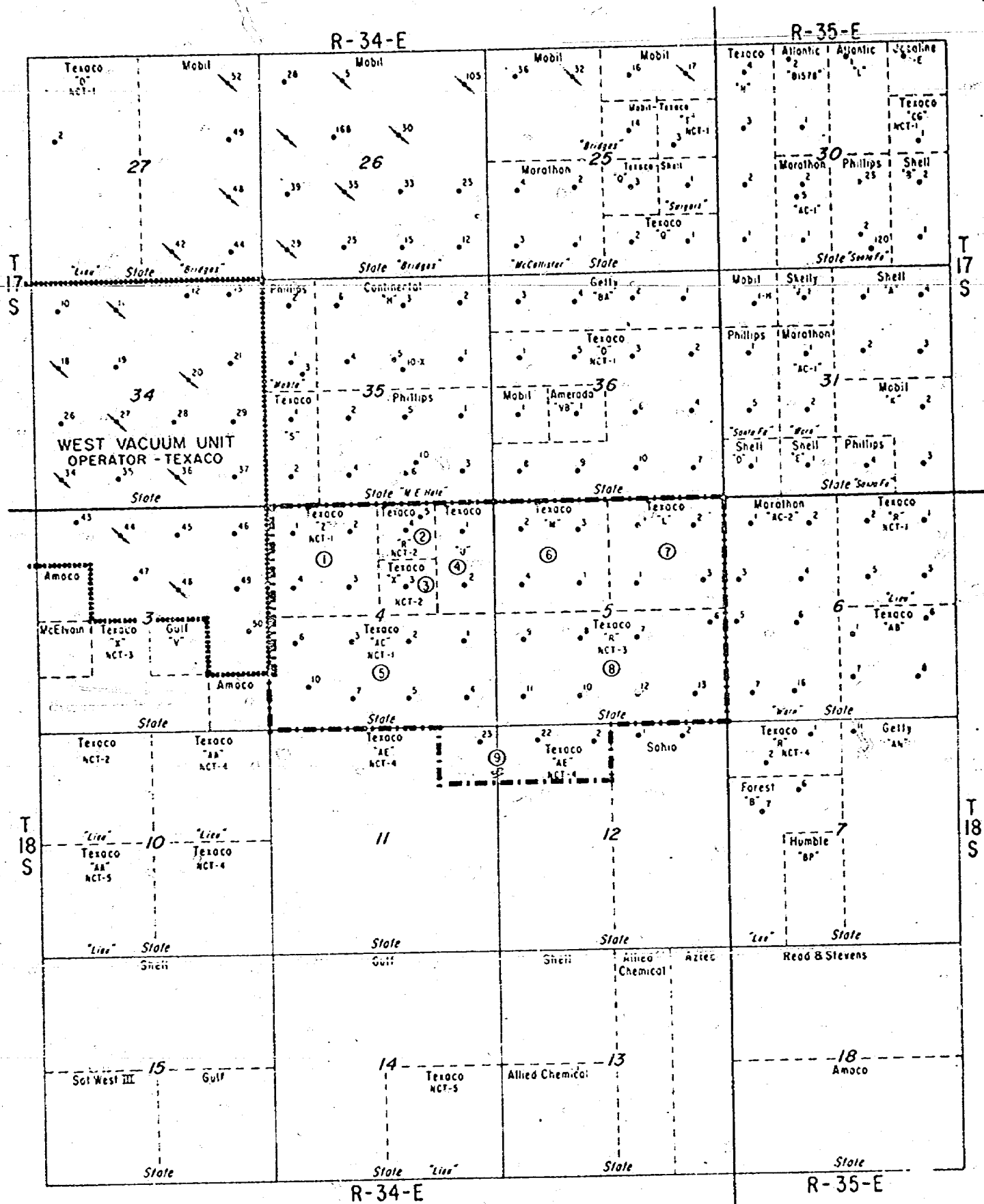
By: [Signature]
Attorney-in-Fact

STATE OF Texas

COUNTY OF Willard

The foregoing instrument was acknowledged before me this 26 day of October, 1982, by [Signature], Attorney-in-Fact of TEXACO Inc., a Delaware corporation, on behalf of said corporation.

[Signature]
Notary Public in and for Willard County, Texas



LEGEND

- UNIT OUTLINE
- TRACT NUMBER

EXHIBIT "A"

VACUUM GRAYBURG SAN ANDRES UNIT
LEA COUNTY, NEW MEXICO

SCALE: 0' 2000' 4000'

KLP/FMR

10-3-72
REV. 10-5-72 RWT

EXHIBIT "B"
SCHEDULE SHOWING TRACT PARTICIPATIONS AND PERCENTAGE AND KIND OF OWNERSHIP
OF ALL LANDS WITHIN THE VACUUM GRAYBURG SAN ANDRES UNIT
TOWNSHIP 18 SOUTH, RANGE 34 EAST, LEA COUNTY, NEW MEXICO

TRACT NO.	DESCRIPTION	NO. OF ACRES	SERIAL NO. & DATE OF LEASE OR APPLICATION	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY & PERCENTAGE	WORKING INTEREST & PERCENTAGE	PERCENTAGE OF TRACT PARTICIPATION
1	T18S-R34E Section 2; lots 3 & 4, SW/4 NW/4, SE/4 NW/4	161.41	B-3011-1 6-11-34 H.B.P.	State of New Mexico 12.50 (Common School)	Texaco Inc.	None	Texaco Inc. 100%	10.42594
2	T18S-R34E Section 2; lot 2	40.83	B-1306-1 11-10-32 H.B.P.	State of New Mexico 12.50 (Common School)	Texaco Inc.	None	Texaco Inc. 100%	3.39055
3	T18S-R34E Section 2; SW/4 NE/4	40.00	B-1446-1 12-10-32 H.B.P.	State of New Mexico 12.50 (Lieu)	Texaco Inc.	None	Texaco Inc. 100%	3.17854
4	T18S-R34E Section 2; lot 1, SE/4 NE/4	80.92	B-867-1 5-6-32 H.B.P.	State of New Mexico 12.50 (Common Sch.)	Texaco Inc.	None	Texaco Inc. 100%	6.44204
5	T18S-R34E Section 2; NE/4 SE/4, NW/4 SW/4, SW/4 SW/4, SE/4 SW/4, NE/4 SE/4, NW/4 SE/4, SW/4 SE/4, SE/4 SE/4	320.00 AC	B-1189-1 9-10-32 H.B.P.	State of New Mexico 12.50 (Common School)	Texaco Inc.	None	Texaco Inc. 100%	11.86692

TRACT NO.	DESCRIPTION	NO. OF ACRES	SERIAL NO. & DATE OF LEASE OR APPLICATION	BASIC ROYALTY & PERCENTAGE	LESSEE OF RECORD	OVERRIDING ROYALTY & PERCENTAGE	WORKING INTEREST & PERCENTAGE	PERCENTAGE OF TRACT PARTICIPATION
6	<u>T18S-R34E</u> Section 1; lots 3 & 4, "N1" SW/4, NW/4, SE/4, NW/4	161.58	B-1080-1 7-30-32 H.B.P.	State of New Mexico 12.50 Texaco Inc. (Lieu)	None	Texaco Inc. 100%	17.37656	
7	<u>T18S-R34E</u> Section 1; lots 1 & 2, "L" SW/4, NE/4, SE/4, NE/4	160.90	B-1733-1 2-17-33 H.B.P.	State of New Mexico 12.50 Texaco Inc. (Lieu)	None	Texaco Inc. 100%	19.91948	
8	<u>T18S-R34E</u> Section 1; NE/4 SW/4, NW/4 SW/4, SW/4 SW/4, SE/SW/4, "R" NE/4 SE/4, NW/4 SE/4, SW/4 SE/4, SE/4 SE/4	320.00	B-1306-1 11-10-32	State of New Mexico 12.50 Texaco Inc. (M. Inst.)	None	Texaco Inc. 100%	26.17080	
9	<u>T18S-R34E</u> Section 11; NE/4 NE/4, and Section 12; "AE" NE/4 NW/4, NW/4 NW/4	120.00	B-1258-1 10-10-32 H.B.P.	State of New Mexico 12.50 Texaco Inc. (Lieu)	None	Texaco Inc. 100%	1.22907	

Nine (9) State Tracts containing 1,405.64 Acres and 100.00% of Unit Area

100.00000%



PHILLIPS PETROLEUM COMPANY

OOESSA, TEXAS 75760
PHILLIPS BUILDING, FOURTH & WASHINGTON

EXPLORATION & PRODUCTION DEPARTMENT

October 17, 1972

In re: Cases Nos. 4851 and 4852--
Application of Texaco Inc.
for Unitization and Pressure
Maintenance Project--Vacuum
Grayburg/San Andres Pool,
Lea County, New Mexico

File: W2-Ed-632-72

New Mexico Oil Conservation Commission - 3

P. O. Box 2088

Santa Fe, New Mexico 88750

Attention: Mr. A. L. Porter
Secretary-Director

Gentlemen:

Phillips Petroleum Company, as an Offset Operator, has been duly notified by Texaco Inc. of their application before the Commission for the approval of a unitization and pressure maintenance project in the Vacuum Grayburg/San Andres Field, Lea County. Said application is docketed as Cases Nos. 4851 and 4852 to be heard on November 1, 1972, and covers leases comprising Sections 1 and 2, NE/4 NE/4 Section 11, and N/2 NW/4 Section 12, all in T-17-S, R-35-E.

Phillips Petroleum Company hereby waives any and all objections to the approval of the proposed unit and project, subject to the following conditions:

"That any producing well in the unit area which directly or diagonally offsets a well outside the unit area producing from the same common source of supply shall not be granted any bonus allowable nor be permitted to produce in excess of top unit allowable for the pool without having same authorized only after notice and hearing, showing that substantial response to injection has occurred".

Yours very truly,

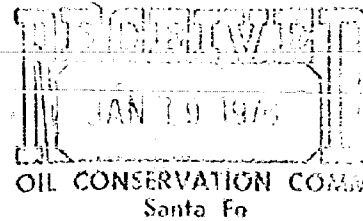
PHILLIPS PETROLEUM COMPANY

G. W. Edwards, Supervisor
Reservoir Engineering

HM:rm

cc: New Mexico Oil Conservation Commission, Box 1980, Hobbs, New Mexico 88240
Texaco Inc., Attention Mr. R. G. Brown, Assistant Division Manager,
P. O. Box 3109, Midland, Texas 79701

*File
Case 4852*



January 15, 1973

New Mexico Oil Conservation Commission
P. O. Box 1980
Hobbs, New Mexico 88240

Re: Project Allowable, TEXACO Inc.
Vacuum Grayburg-San Andres
Pressure Maintenance Project

Attention: Mr. J. D. Ramey

Gentlemen:

Water injection operations commenced in four injection wells in the referenced project on January 14, 1973 and a project allowable is hereby requested as authorized by Commission Order No. R-4442, Rule 8 (4), dated November 27, 1972.

Injection wells No. 15, 17, 29, and 31 as shown on the attached plat, are currently injecting 500 barrels of water per day per well at zero pressure.

Attached as requested, is a tabulation of the capacity producing rates and the corresponding allowables requested for the wells located in the referenced project. Allowables for additional wells completed prior to February 15, 1973 will be made on an individual well basis. Beginning on February 15, a report will be submitted to your office monthly with the nomination of the proposed daily allowable for the following month for each well as required by Rule 5 of Order No. R-4442.

Your cooperation in this matter will be appreciated.

Yours very truly,

J. V. Gannon
District Superintendent

KLP:ar

MAS, Jr.
N.M.O.C.C. Santa Fe

Attachments

TABULATION OF CAPACITY WELL TESTS
VACUUM GRAYBURG - SAN ANDRES UNIT

Well No.	Capacity Test		Requested Allowable
	BOPD	BWPD	BOPD
# 1	20	0	20
2	2	3	2
3	10	0	10
4	To Be Drilled		
5	To Be Drilled		
6	48	0	48
7	55	24	55
8	23	102	23
9	120	0	100
10	110	0	100
11	120	105	80
12	104	0	80
13	109	0	80
15	Injector		80
16	Drilling		
17	Injector		80
18	To Be Drilled		
19	To Be Drilled		
21	31	90	31
22	93	3	93
23	122	30	96
24	110	30	100
25	125	0	100
26	120	57	100
27	105	10	103
28	105	0	80
29	Injector		80
30	Drilling		
31	Injector		80
32	To Be Drilled		
33	Drilling		
34	211	34	211
36	82	8	80
37	130	0	110
38	95	7	95
39	120	8	110
40	81	8	81
41	92	7	86
42	92	8	86
43	120	10	80

TABULATION OF CAPACITY WELL TESTS
VACUUM GRAYBURG-SAN ANDRES UNIT

Page 2

Well No.	Capacity Test		Requested Allowable	
	BOPD	BWPD	BOPD	
#48	To Be Drilled			
49	To Be Drilled		80	
51	97	8	80	
52	95	8	80	
53	95	7	80	
54	132	8	80	
55	110	10	80	
56	93	8	80	
57	91	8	80	
58	120	10	80	

State of New Mexico

505-227-2748



Commissioner of Public Lands

October 18, 1972

ALEX J. ARNISO
COMMISSIONER

P. O. Box 1148
SANTA FE, NEW MEXICO

Texaco Inc.
P. O. Box 3109
Midland, Texas 79701

Re: Proposed Vacuum Grayburg San
Andres Unit
Lea County, New Mexico

OCT 23 1972

LAND DEPT.

ATTENTION: Mr. F. M. Mason

Gentlemen:

We have reviewed your proposed Vacuum Grayburg San Andres Unit Agreement as well as the Exhibits submitted to this office. This form meets with the requirements of the Commissioner of Public Lands, therefore, the Commissioner approves the proposed agreement as to Form and Content.

Upon submitting this unit for final approval the following are required by this office:

1. Application for final approval stating Tracts qualified and verification that the working interest in the qualified tracts have been contacted and requested to join. State all tracts committed and tracts not committed.
2. Two executed copies of Unit Agreement-one must be an original
3. Two sets of all Ratifications from Lessees of Record and Working Interest Owners-one copy must be an original
4. Filing Fee in the amount of Forty (\$40.00) Dollars
5. Order of the Oil Conservation Commission
6. Initial Plan of Operation
7. Re-designation of wells

If we may be of further service please do not hesitate to call on us.

Very truly yours,

Ray D. Graham
RAY D. GRAHAM, Director
Oil and Gas Department

BEFORE EXAMINER UTZ
AJA/RDG/OIL CONSERVATION COMMISSION

EXHIBIT NO. _____

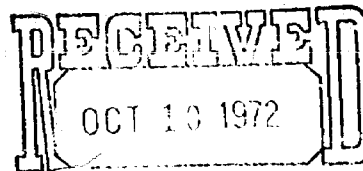
MEMO. _____



PETROLEUM PRODUCTS

PRODUCING DEPARTMENT-
UNITED STATES
MIDLAND DIVISION

October 9, 1972



OIL CONSERVATION COMM
Santa Fe

TEXACO INC.
P. O. BOX 3109
MIDLAND, TEXAS 79701

REQUEST FOR HEARING
UNITIZATION AND PRESSURE MAINTENANCE
VACUUM GRAYBURG-SAN ANDRES POOL
LEA COUNTY, NEW MEXICO

New Mexico Oil Conservation Commission
P. O. Box 2088
Santa Fe, New Mexico 88750

Attention: Mr. A. L. Porter, Secretary Director

Gentlemen:

Texaco Inc. respectfully requests that evidence be considered at the November 1, 1972 Examiner Hearing in Santa Fe, New Mexico, for an application to:

1. Unitize 1400 acres in the Vacuum Grayburg-San Andres Pool.
2. Drill eight (8) injectors and seven (7) producers at unorthodox locations.
3. Initiate pressure maintenance operations.
4. Assign a bonus allowable to the project area.

The proposed unit area is comprised of nine state leases, all of which are 100% owned and operated by Texaco, but with three separate royalty beneficiaries. The Unit Agreement has been prepared and will be forwarded to the State Land Office for approval.

It is planned to develop an 80-acre inverted nine-spot flood pattern by drilling eight (8) injection wells and seven (7) producing wells. Injection will be into the Grayburg-San Andres formation at an average depth of 4000 to 4800 feet. Initial injection rates are anticipated to be 1500 barrels of water per day per well. Fresh water will be used for injection fluid and is available from four water supply wells located in Sections 1 and 2 of T-18-S, R-34-E and Section 30 of T-17-S, R-35-E. These wells were permitted by the State Engineer in the Lea County Shallow Underground Basin under Permits L-2722, L-2723, and L-4247 through L-4247-X-3 with a combined appropriation of 2100 acre-feet (44,000 BPD) per year.

Case 4852

New Mexico Oil
Conservation Commission

-2-

October 9, 1972

Attached is a plat of the proposed project area, a diagrammatic sketch of a typical injection well, a list of leases and corresponding royalty beneficiaries, and a list of offset operators. Detailed information supporting this application will be presented at the hearing.

A copy of this letter is being forwarded to the Commissioner of Public Lands in Santa Fe, New Mexico. A copy of the letter together with attachments is being mailed to each offset operator.

Yours very truly,

Darrell Smith
Division Manager

By R. G. Brown
R. G. Brown
Assistant to Division Manager

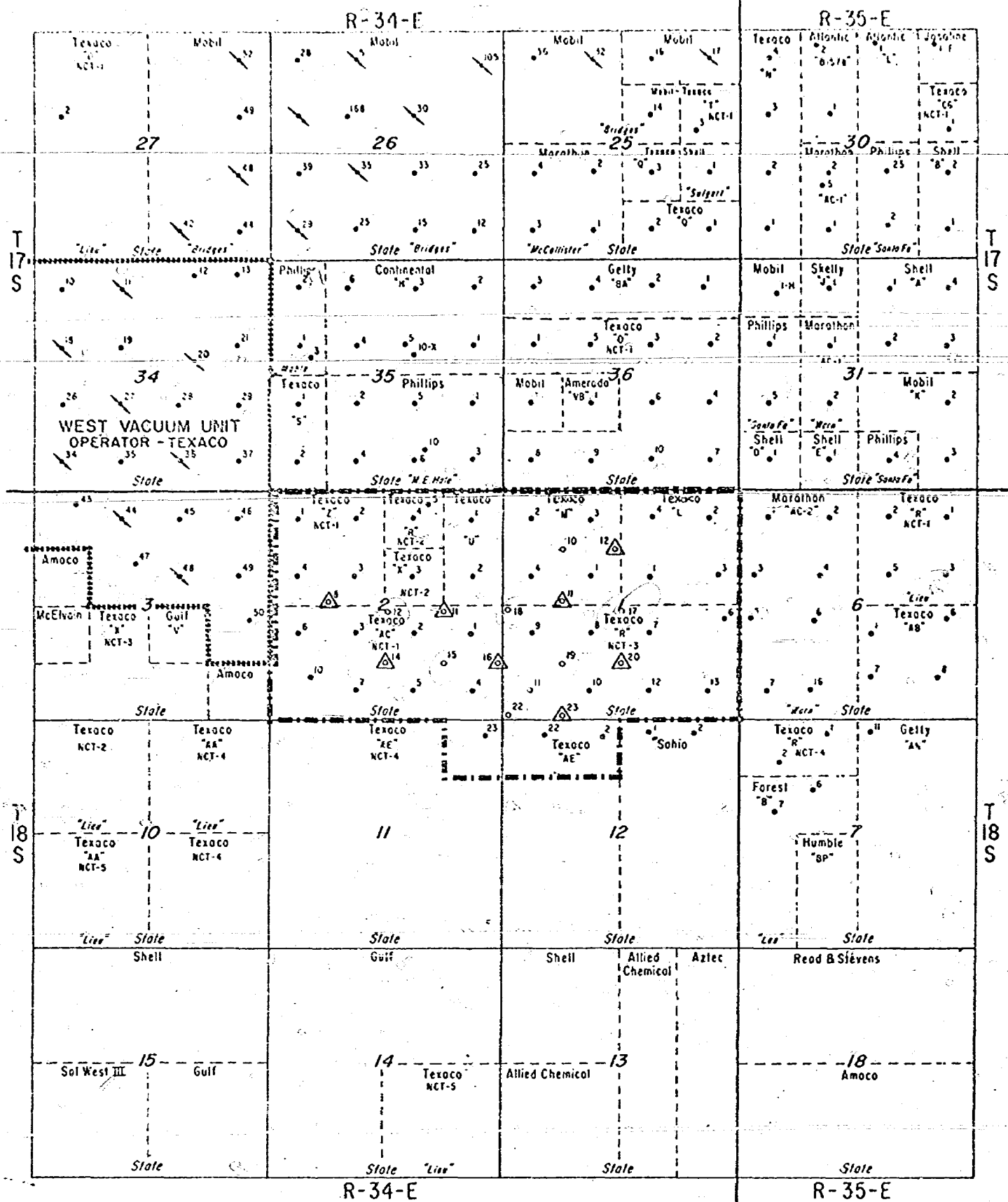
KWH/sl

Attachments

cc: Commissioner of Public Lands

All Offset Operators (List Attached)

bcc: JVG

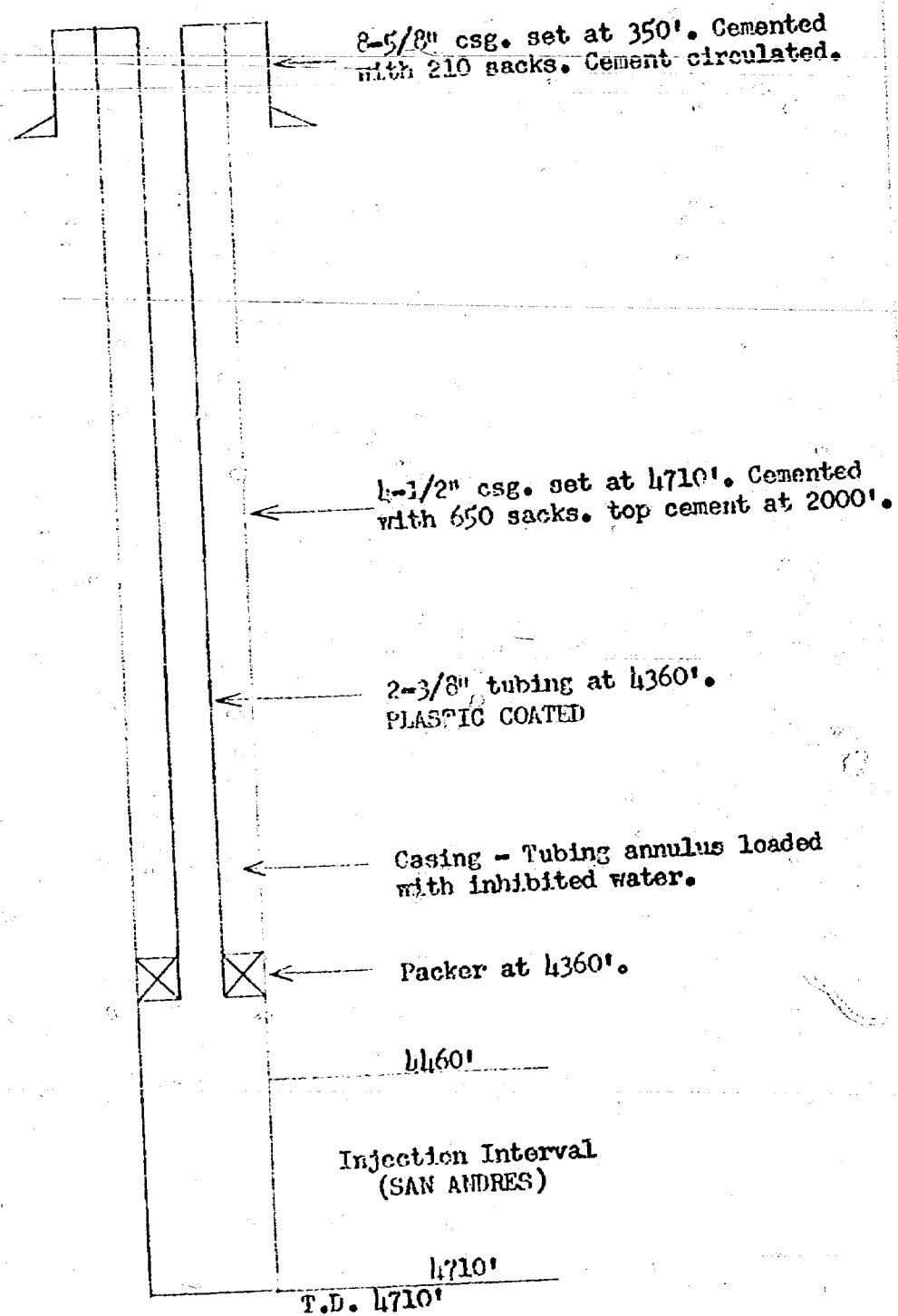


--- OUTLINE OF VACUUM GRAYBURG SAN ANDRES UNIT PROPOSED

- PRODUCERS TO BE DRILLED
- △ INJECTORS TO BE DRILLED

FIGURE NO. 6
 TEXACO Inc.
 A PORTION OF
 VACUUM GRAYBURG SAN ANDRES POOL
 LEA COUNTY, NEW MEXICO

SCALE: 0' 2000' 4000'
 FMR 7-11-72



Diagrammatic sketch of typical injection well

TEXACO INC.
NEW MEXICO "R" STATE (NCT-3) NO. 20
VACUUM GRAYBURG-SAN ANDRES POOL
LEA COUNTY, NEW MEXICO

LIST OF BENEFICIARIES

<u>LEASE</u>	<u>BENEFICIARY</u>
New Mexico "L" State	Lieu
New Mexico "M" State	Lieu
New Mexico "R" State (NCT-2)	Common School Land
New Mexico "R" State (NCT-3)	Military Institute
New Mexico "U" State	Common School Land
New Mexico "X" State (NCT-2)	Lieu
New Mexico "Z" State (NCT-1)	Common School Land
New Mexico "AC" State (NCT-1)	Common School Land
New Mexico "AE" State	Lieu

LIST OF OFFSET OPERATORS

Amoco Production Company
Box 3092
Houston, Texas 77001

Humble Oil & Refining Company
Box 1600
Midland, Texas 79701

Marathon Oil Company
P. O. Box 552
Midland, Texas 79701

Phillips Petroleum Company
Phillips Building
Odessa, Texas 79760

Shell Oil Company
Box 1509
Midland, Texas 79701

Sohio Petroleum Company
Box 3167
Midland, Texas 79701

DRAFT

DSN/dr

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. 4852

Order No. R-4442

APPLICATION OF TEXACO INC FOR A
PRESSURE MAINTENANCE PROJECT AND
SPECIAL RULES THEREFOR, LEA
COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on November 1, 1972,
at Santa Fe, New Mexico, before Examiner ELVIS A. UTZ.

NOW, on this day of November, 1972, 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, Texaco Inc., seeks authority to
institute a pressure maintenance project in its Vacuum Grayburg
San Andres Unit Area, Vacuum Grayburg-San Andres Pool, Lea County,
New Mexico, by the injection of approximately 1,500 barrels of
water per day into the Grayburg and San Andres formations through
each of eight injection wells proposed to be drilled at unorthodox
locations in Sections 1 and 2, Township 18 South, Range 34 East, NMPM.

(3) That the applicant also seeks authority to drill seven additional producing wells at unorthodox locations in said Sections 1 and 2.

(4) That the applicant further seeks the designation of a project area and the promulgation of rules for the project area, including provision for the assignment of top unit allowable to all wells in the project area, top unit allowable to each of the 15 additional injection and producing wells to be drilled in the project area, and an additional 75 percent of top unit allowable to be assigned to ~~all~~ ^{each} wells in the project area as a bonus allowable for the injection of water.

(5) That a pressure maintenance project area comprising all of the Vacuum Grayburg San Andres Unit Area, being all of Sections 1 and 2, the NE/4 NE/4 of Section 11, and the N/2 NW/4 of Section 12, all in Township 18 South, Range 34 East, is in the interest of conservation and should result in greater ultimate recovery of oil, thereby preventing waste.

(6) That top unit allowable for the Vacuum Grayburg-San Andres Pool should be assigned to all wells in the project area upon initiation of ^{substantial} water injection, and each of the proposed 15 additional wells should also receive top unit allowable upon completion. That the project allowable should be the sum of the allowables assigned to the wells in the project area and should be permitted to be produced from any well in the project area, provided however, that any producing well in the project area which directly or diagonally offsets a well outside the project area producing from the same common source of supply should not be permitted to produce in excess of top unit allowable for the pool without a showing at public hearing that substantial response to water injection has occurred in said well.

Case No. 4852
Order No. R-

(7) That approval of the proposed eight injection wells and seven producing wells, all at unorthodox locations, and the proposed pressure maintenance project, subject to the provisions of Finding No. (6) above, will not cause but will prevent waste and will protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Texaco Inc, is hereby authorized to operate a pressure maintenance project in its Vacuum Grayburg San Andres Unit Area, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico, to be designated the Texaco Vacuum Grayburg-San Andres Pressure Maintenance Project, by the injection of water into the Grayburg and San Andres formations through eight injection wells to be drilled at the following unorthodox locations in Township 18 South, Range 34 East, NMPM:

<u>LEASE NAME</u>	<u>WELL NO</u>	<u>LOCATION</u>	<u>SECTION</u>
New Mexico "M" State	11	2630' FNL & 1310' FWL	1
New Mexico "M" State	12	1330' FNL & 2630' FWL	1
New Mexico "AC" NCT-1 State	11	2630' FSL & 1330' FEL	2
New Mexico "AC" NCT-1 State	14	1400' FSL & 2550' FEL	2
New Mexico "AC" NCT-1 State	16	1400' FSL & 10' FEL	2
New Mexico "R" NCT-3 State	20	1310' FSL & 2630' FEL	1
New Mexico "R" NCT-3 State	23	100' FSL & 1420' FWL	1
New Mexico "Z" NCT-1 State	8	2630' FNL & 1310' FWL	2

(2) That the applicant is hereby authorized to drill seven additional producing wells in its Vacuum Grayburg San Andres Pressure Maintenance Project at the following unorthodox locations in Township 18 South, Range 34 East, NMPM:

<u>LEASE NAME</u>	<u>WELL NO</u>	<u>LOCATION</u>	<u>SECTION</u>
New Mexico "M" State	10	1330' FNL & 1330' FWL	1
New Mexico "AC" NCT-1 State	12	2630' FSL & 2630' FWL	2
New Mexico "AC" NCT-1 State	15	1400' FSL & 1300' FEL	2
New Mexico "R" NCT-3 State	17	2630' FSL & 2630' FEL	1
New Mexico "R" NCT-3 State	18	2630' FSL & 10' FWL	1
New Mexico "R" NCT-3 State	19	1330' FSL & 1330' FWL	1
New Mexico "R" NCT-3 State	22	100' FSL & 100' FWL	1

(3) That Special Rules and Regulations governing the operation of the Texaco Vacuum Grayburg-San Andres Pressure Maintenance Project are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
TEXACO INC. VACUUM GRAYBURG-SAN ANDRES
PRESSURE MAINTENANCE PROJECT

RULE 1. The project area of the Texaco Inc. Vacuum Grayburg-San Andres Pressure Maintenance Project, hereinafter referred to as the Project, shall comprise the area described as follows:

LEA COUNTY, NEW MEXICO
TOWNSHIP 18 SOUTH, RANGE 35 EAST, NMPM
Sections 1 and 2: All
Section 11: NE/4 NE/4
Section 12: N/2 NW/4

RULE 2. The allowable for the project area shall be known as the project allowable and shall be equal to top unit allowable for the Vacuum Grayburg-San Andres Pool times the number of wells in the project area completed in the Grayburg and/or San Andres formations for production from, or injection into, said formations.

RULE 3. The project allowable may be produced from any well or wells completed in the Vacuum Grayburg-San Andres Pool in the project area, provided however, that any well in the project area which directly or diagonally offsets a well outside the project area producing from the same common source of supply shall not be permitted to produce in excess of top unit allowable for the Vacuum Grayburg-San Andres Pool until it has been established after notice and hearing that such well has experienced a substantial response to water injection.

RULE 4. Each producing well in the project area shall be subject to the limiting gas-oil ratio (2500 to one) for the Vacuum Grayburg-San Andres Pool.

RULE 5. Each month the project operator shall, by the ¹⁵~~30~~th day of the month, submit to the Hobbs district office of the Commission a report ^{for the previous month} showing average daily water injection into each injection well, total water injected into each well, and total cumulative water injected into each well. The report shall also list each producing well, and average daily and total monthly production from same, together with a nomination of proposed daily allowable ^{for} ~~from~~ each of said wells for the following month. The aforesaid report shall be filed in lieu of Form C-120 for the project.

RULE 6. The Commission shall, upon review of the report and after any adjustments deemed necessary in accordance with Rules 3 and 4 of these rules, assign an allowable to each of the various producing wells in the project area for the next succeeding month.

RULE 7. The conversion of producing wells to injection, or the drilling of additional wells for injection purposes shall be accomplished only after approval of the same by the Secretary-Director of the Commission. To obtain such approval, the Project operator shall file application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional injection wells shall include the following:

(1) A plat showing the location of proposed injection well, all wells within the project area, and offset operators, locating wells which offset the project area.

(2) A schematic drawing of the proposed injection well which fully describes the casing, tubing, perforated interval, and depth showing that the injection of water will be confined to the Grayburg and San Andres formations.

(3) A letter stating that all offset operators within one-half mile of the proposed injection well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed injection well, if within 20 days after receiving the application, no objection to the proposal is received. The Secretary-Director may grant immediate approval, provided waivers of objection are received from all offset operators.

Expansion of the project area may be approved by the Secretary-Director of the Commission administratively when good cause is shown therefor.

RULE 8. Additional producing wells may also be drilled *at unorthodox locations anywhere* within the project area not closer than 1320 feet of the outer boundaries of the project area. The Secretary-Director of the Commission shall have authority to grant permission to drill any well within the provisions of this rule without notice and hearing.

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Case No. 4852

Order No. R-

(4) That the effective date of the allowable provisions of this order shall be the date that actual water injection operations commence in a minimum of four of the eight authorized injection wells.

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

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

(2)

section is being started early
which is claimed to increase
recovery approx. 2.4 M² bbl. +
the drilling of 15 MSL wells
which it is claimed will increase
recovery another 2.4 M² bbl. It
is also claimed that not
granting some bonus allowable
would decrease the recovery
1.0 M² bbl. They requested
5460 bbl. allowable I can recom-
mend 4000.

Usual Sec. Rec. order other-
wise.

Tha B. W.

Limit the wells adjacent to
the unit boundary to 1 - 80 Bbl.
allowable.

Tha B. W.

CASE 4853: Appli. of EL PASO
NATURAL GAS CO. FOR AMENDMENT
OF GAS WELL TESTING PROCEDURES.