

CASE 5564: LLANO, INC., FOR A
PRESSURE MAINTENANCE PROJECT, LEA
& EDDY COUNTIES, NEW MEXICO

CASE NO.

5564

APPLICATION,
TRANSCRIPTS,
SMALL EXHIBITS,

ETC.



OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

P. O. BOX 2088 - SANTA FE

87501

DIRECTOR
JOE D. RAMEY

LAND COMMISSIONER

PHIL R. LUCERO

November 18, 1975



STATE GEOLOGIST
EMERY C. ARNOLD

Re: CASE NO. 5564

ORDER NO. R-5123

Clarence Hinkle
Hinkle, Bondurant, Cox & Eaton
Attorneys at Law
Post Office Box 10
Roswell, New Mexico 88201

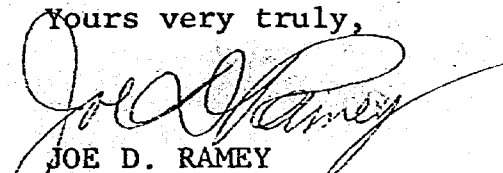
Applicant:

Llano, Inc.

Dear Sir:

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

Yours very truly,


JOE D. RAMEY
Director

JDR/fd

Copy of order also sent to:

Hobbs OCC X
Artesia OCC X
Aztec OCC

Other Don Maddux

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. 5564
Order No. R-5123

APPLICATION OF LLANO, INC. FOR A
PRESSURE MAINTENANCE PROJECT, LEA
AND EDDY COUNTIES, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on October 8, 1975,
at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this 17th day of November, 1975, 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 sub-
ject matter thereof.

(2) That the applicant, Llano, Inc., seeks authority to in-
stitute a pilot pressure maintenance project in the Lusk Strawn
Pool, Lea and Eddy Counties, New Mexico, by the injection of
extraneous gas into the Strawn formation through two wells in its
Lusk Strawn Deep Unit Area, and by the cycling and reinjection of
produced gas from said unit and pool.

(3) Applicant further seeks rules governing said project,
including but not limited to provision for expansion of the pro-
ject area, placing additional wells on injection, changes in in-
jection pattern for sweep efficiency and determination of project
allowable.

(4) That the initial project area should consist of the
following described acreage in Lea and Eddy Counties, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM
Section 31: SE/4
Section 32: SW/4

TOWNSHIP 19 SOUTH, RANGE 31 EAST, NMPM
Section 12: NE/4

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Case No. 5564
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TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM

Section 5: W/2

Section 6: E/2

Section 7: N/2

Section 8: W/2

(5) That the project area should be expanded upon completion of additional injection wells or upon a proper showing by the project operator.

(6) That the project allowable should be equal to the top unit allowable for the Lusk-Strawn Pool times the number of proration units within the project area.

(7) That transfer of allowable within the project area should be permitted.

(8) That upon reinjection of available residue gas, wells within the project area should not be subject to the limiting gas-oil ratio for the Lusk-Strawn Pool.

(9) That initial gas injection is proposed through the former Tenneco Oil Company Continental A Federal Well No. 1 and Continental Federal Com Well No. 1 located in Units G and O, respectively, of Section 6, Township 19 South, Range 32 East, NMPM, Lea County, New Mexico.

(10) That the operator should take all measures necessary including injection through tubing under a packer, loading and monitoring of the casing-tubing annulus, and periodic inspection of injection and producing wells to ensure that all gas shall be injected into and be confined within the Strawn formation.

(11) That approval of the subject application will protect correlative rights and prevent waste.

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

IT IS THEREFORE ORDERED:

(1) That the applicant, Llano, Inc., is hereby authorized to institute a pressure maintenance project on its Lusk-Strawn Deep Unit, Lusk-Strawn Pool, by the injection of gas into the Strawn formation through the following-described wells in Section 6, Township 19 South, Range 32 East, NMPM, Lea County, New Mexico:

<u>FORMER OPERATOR</u>	<u>LEASE NAME</u>	<u>No.</u>	<u>UNIT</u>
Tenneco Oil Co.	Continental A Federal	1	G
Tenneco Oil Co.	Continental Federal	Com 1	O

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

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

(4) That the subject pressure maintenance project is hereby designated the Lusk Strawn Deep Unit Pressure Maintenance Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

(5) That Special Rules and Regulations governing the operation of the Lusk Strawn Deep Unit Pressure Maintenance Project are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
LUSK STRAWN DEEP UNIT PRESSURE MAINTENANCE PROJECT

Rule 1. That the initial project area in the Unit shall comprise the following described area in Lea and Eddy Counties, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 31: SE/4

Section 32: SW/4

TOWNSHIP 19 SOUTH, RANGE 31 EAST, NMPM

Section 12: NE/4

TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM

Section 5: W/2

Section 6: E/2

Section 7: N/2

Section 8: W/2

Rule 2. That the project area shall be expanded automatically to include all proration units in the Lusk Strawn Deep Unit on which gas injection wells are located and all direct and diagonal offsetting proration units.

Rule 3. That the project area may be otherwise expanded administratively by the Secretary-Director of the Commission upon a proper showing by the operator.

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Order No. R-5123

Rule 4. The allowable for the project area shall be any amount up to and including a volume equal to the top unit allowable for the Lusk-Strawn Pool times the number of proration units in the project area.

Rule 5. The allowable to the project area may be produced from any well or wells within the project area in any proportion, provided that no producing well in the project area which directly or diagonally offsets a well not committed to the unit and producing from the same common source of supply shall produce in excess of the top allowable for the Lusk-Strawn Pool.

Rule 6. That provided that all available residue gas is reinjected, wells in the project area shall not be subject to the limiting gas-oil ratio for the Lusk-Strawn Pool. For the purpose of these rules, "Available Residue Gas" shall be defined as being all gas produced from the unitized formation less plant shrinkage, plant fuel, and lease fuel required for operation of the lease.

Rule 7. The Secretary-Director of the Commission is hereby authorized to approve such additional producing wells and injection wells at orthodox and unorthodox locations within the boundaries of the Lusk Strawn Deep Unit Area as may be necessary to complete an efficient production and injection pattern, provided said producing wells are drilled no closer than 660 feet to the outer boundary of said unit nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary. To obtain such approval, the project operator shall file proper application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional production or injection wells shall include the following:

(a) A plat identifying the lands committed to the unit agreement and those lands not committed to said agreement, and showing the location of the proposed well, all wells within the unit area, and offset operators.

(b) A schematic drawing of any proposed injection well which fully describes the casing, tubing, packer, monitoring equipment, perforated interval, and depth.

(c) A letter stating that all offset operators to the proposed well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed 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.

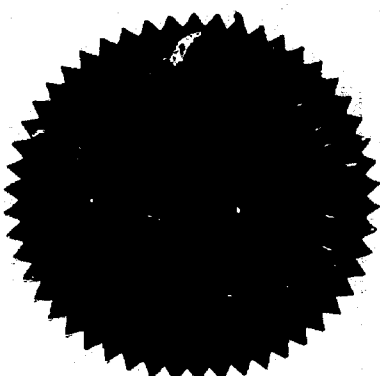
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(6) That monthly progress reports of the project herein authorized shall be submitted to the Commission in accordance with Rule 704 of the Commission Rules and Regulations on forms approved by the Commission.

(7) 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.



S E A L

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

Phil R. Lucero

PHIL R. LUCERO, Chairman

Emery C. Arnold
EMERY C. ARNOLD, Member

Joe D. Ramey
JOE D. RAMEY, Member & Secretary

jr/

BEFORE THE
NEW MEXICO OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
October 8, 1975

EXAMINER HEARING

IN THE MATTER OF:

Application of Llano, Inc. for a unit
agreement, Lea and Eddy Counties,
New Mexico.

CASE
5563

Application of Llano, Inc. for a
pressure maintenance project, Lea and
Eddy Counties, New Mexico.

CASE
5564

BEFORE: Richard L. Stamets, Examiner.

TRANSCRIPT OF HEARING

A P P E A R A N C E S

For the New Mexico Oil
Conservation Commission:

William F. Carr, Esq.
Legal Counsel for the Commission
State Land Office Building
Santa Fe, New Mexico

For the Applicant:

Clarence Hinkle, Esq.
HINKLE, BONDURANT, COX & EATON
Attorneys at Law
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Roswell, New Mexico

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I N D E XG. W. EDWARDS

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1 MR. STAMETS: We will call the next Case, 5563.

2 MR. CARR: Case 5563, application of Llano, Inc.
3 for a unit agreement, Lea and Eddy Counties, New Mexico.

4 MR. HINKLE: Clarence Hinkle, Hinkle, Bondurant,
5 Cox and Eaton appearing on behalf of Llano, Inc. We also
6 have associated with us Don Maddox of Hobbs who is supposed
7 to be here. He just stepped out and he will probably be
8 here shortly. We have one witness and I believe sixteen
9 exhibits.

10 MR. STAMETS: Any other appearances in this Case?

11 (THEREUPON, the witness was duly sworn.)

12 MR. HINKLE: Mr. Examiner, Jerry Losee who was
13 here earlier asked me whether or not Case 5563 was a forced
14 pooling for unitization, a forced unitization, and I told
15 him it wasn't and I would like to let the record show that
16 there is no intention from this application for forced
17 unitization.

18 We would like to call the next Case too because
19 our exhibits overlap, and we would like to have these cases
20 consolidated for purposes of testimony.

21 MR. STAMETS: Is there any objection to the
22 consolidation of these two Cases?

23 Will you call Case 5564, please?

24 MR. CARR: Case 5564, application of Llano, Inc.
25 for a pressure maintenance project, Lea and Eddy Counties,

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1 New Mexico.

2 MR. STAMETS: These two Cases will be consolidated
3 for purpose of testimony.

4 G. W. EDWARDS

5 called as a witness, having been first duly sworn, was
6 examined and testified as follows:

7 DIRECT EXAMINATION

8 BY MR. HINKLE:

9 Q State your name, your address and by whom you are
10 employed.

11 A My name is G. W. Edwards; I live in Hobbs, New
12 Mexico; and I'm employed by Llano, Incorporated in Hobbs.

13 Q What is your position with Llano?

14 A Executive Vice President.

15 Q Have you ever testified before the Oil Conservation
16 Commission?

17 A No, sir.

18 Q Are you a geologist and a petroleum engineer?

19 A A geological engineer and a registered professional
20 engineer.

21 Q State briefly your educational background and your
22 qualifications and experiences as a geologist and a
23 petroleum engineer, or an engineer?

24 A In 1950 I graduated from the St. Louis University
25 with a degree in geological engineering. Shortly thereafter

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1 I took a position with the Bureau of Mines as a mineral
2 specialist. In 1951 I went to the Federal Power Commission
3 in Washington, D.C. as a reservoir engineer and gas geologist
4 in the Division of Gas Certificates. In 1953 I was employed
5 by Phillips Petroleum Company as a reservoir engineer. Sub-
6 sequent to that time I became a reservoir engineer in the
7 Economics Department. In 1963 I was assistant manager of
8 the Reservoir Engineering Division and Economics Department.
9 As a result of departmental consolidations, in 1968 I became
10 director of the Reservoir Engineering Division for the
11 Western Region in the Exploration and Production Department.
12 In 1971 I became director of the Reservoir Engineering
13 Division in the Southwestern Region of the Natural Gas
14 Resources. In 1975, June the second, I became employed with
15 Llano, Incorporated in Hobbs as Executive Vice President.

16 I have testified in Texas before the Federal Power
17 Commission and the Security Exchange Commission.

18 Q Have you made a study of the Lusk Strawn Pool area?

19 A Yes, sir, I have.

20 MR. HINKLE: Are the qualifications of the witness
21 acceptable?

22 MR. STAMETS: They are.

23 Q (Mr. Hinkle continuing.) Are you familiar with
24 the applications of Llano in these Cases?

25 A Yes, sir.

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1 Q What is Llano seeking to accomplish?

2 A In the Case of 5563, Llano is seeking approval for
3 the unit agreement covering the Lusk Strawn Pool comprising
4 twenty thousand, eight hundred and sixty-three point eighty-
5 eight acres of Federal and State lands located in Lea and
6 Eddy Counties, New Mexico.

7 Q What about Case 5564?

8 A In Case 5564 Llano is requesting approval of a
9 pressure maintenance project which will be coextensive with
10 the proposed unit area, an authority to institute a pressure
11 maintenance project by injection of gas, initially into
12 two wells. The applicant has further requested rules
13 covering the project and administrative approval for
14 expansion of the project, including conversion of additional
15 wells for the injection of gas.

16 Q Have you prepared or has there been prepared
17 under your direction, certain exhibits for introduction in
18 this Case?

19 A Yes, sir.

20 Q Are those the ones that have been marked one
21 through sixteen?

22 A Yes, sir.

23 Q Refer to Exhibit One and explain what this is
24 and what it shows?

25 A Exhibit One is a land plat and a tract plat,

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1 outlining the proposed unit area, which consists of the
2 twenty thousand, eight hundred and sixty-three point eighty-
3 eight acres.

4 It further defines those lands which are Federal
5 lands and State lands. The Federal lands being eighteen
6 thousand, five hundred and sixty-one point six acres, or
7 eighty-nine point oh six one percent of the total unit area.

8 The State lands, which are the blue-shaded area,
9 accumulate to two thousand, two hundred and eighty-two point
10 twenty-eight acres or ten point nine three nine percent of
11 the proposed unitized land.

12 The blue line on the extreme periphery of it is
13 the proposed unit area.

14 This map also shows the interior units which are
15 the Plains Unit the Lusk Deep Unit and a portion of the Big
16 Eddy Unit in the southwest.

17 It shows the tract designations.

18 Q The tract designations are the ones referred to
19 in the unit agreement?

20 A Yes, sir.

21 It further indicates the leasehold of record and
22 it shows those tracts in which Llano has operational rights
23 in the Strawn.

24 Q Now refer to Exhibit Two and explain what this
25 shows?

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1 A Exhibit Two is termed a general well plat which
2 again shows the confines of the proposed unit area. The
3 shaded area to the southwest is the Big Eddy Unit. The
4 wells that are indicated on there, some three hundred in
5 number, are in compliance with the Commission Rule 701 to
6 show wells in the area and it shows all wells, irrespective
7 of formation and completion. It is color coded in such a
8 way that the producing formations from the Yates on through
9 the Morrow gas zone are identified. The legend also shows
10 the well status symbol with respect to producing wells,
11 shut in, plugged, dry, junked or abandoned, et cetera.

12 Q Are there any further comments with respect to
13 this exhibit?

14 A No, sir.

15 Q Refer to Exhibit Three and explain what that is?

16 A Exhibit Three is a plat, again showing the unit
17 outline as proposed. The Big Eddy Unit is in the cross hatched
18 area. This map is made to show several things, one being
19 that the preceding exhibit showed all of the wells irrespec-
20 tive of completion depth, depth drilled, productive status
21 and so on, and this map is intended to screen out all wells,
22 except those which penetrate into the Strawn. In general
23 it shows Strawn completions and Morrow completions and
24 dry holes which were of sufficient depth to have drilled
25 to the base of the Strawn.

1 On the interior of the unit boundary it shows the
2 zero line of the productive limits, estimated productive
3 limits of the Strawn Reef reservoir.

4 It shows in the northern portion in the east half
5 of Section 6, of Township 18, Range 32 East, the two proposed
6 injection wells, and in the orange arrow they are identified.
7 The orange button shows possible future injection wells which
8 we are not proposing for conversion at this time.

9 In addition to these factors, the heavy dark line
10 which traverses the map from the southwest to the northeast
11 is Llano's twelve-inch pipe line.

12 The square rectangle shaded in dark in Section 20
13 is the proposed Llano compression installation.

14 The round button shaded dark is the remote absorber
15 which will process the gas and this remote absorber will be
16 operated by Phillips Petroleum Company under a processing
17 agreement which is being established.

18 From the Llano compression station going north,
19 the dark dashed line is the line which will carry the
20 injection volume from the compression plant to the two
21 proposed wells.

22 We proposed to inject crestal positions which are
23 high on the structure and produce the oil volumes from the
24 lower structure wells until such time as we experience high
25 gas-oil ratios or break through then the wells will be, of

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1 course, shut in or converted to injection wells.

2 In cases where we do not have additional wells
3 or the pattern is not as we would like to have it for maximum
4 efficiency, we will inject into a given well and withdraw
5 from the same well and process the gas through the remote
6 absorber of Phillips Petroleum Company.

7 Our plan of operation will ultimately go to sixty
8 million a day and in these two wells the injectors that are
9 proposed here and designated by the orange arrow, we propose
10 to inject eight to ten million initially. Ultimately the
11 injection well will accumulate to approximately three
12 hundred and forty-five billion feet.

13 Q What is the source of your gas?

14 A The source of the gas will be extraneous gas which
15 Llano has under contract or will contract at the appropriate
16 time to begin injection.

17 Q Any further comments with respect to Exhibit Three?

18 A No, sir.

19 Q Refer to Exhibit Four and explain that.

20 A Exhibit Four is an isopachous map of the producing
21 reservoir known as the Strawn Reef.

22 The wells colored in red are Lusk Strawn wells.
23 Those which have an additional circle around the red button
24 are currently producing wells.

25 The exterior of the unit boundary is also defined

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1 on this map.

2 The Lusk Strawn Reef reservoir lies on the north-
3 western shelf of the Delaware Basin. The reef itself is
4 defined by oil-water contacts on the east, the southeast,
5 the southwest and generally to the south. It is defined
6 by pinch outs of porosity on the north and the northwest.
7 The reef is currently producing four hundred and thirty
8 barrels of oil a day and approximately two and a half million
9 feet of gas and about two hundred and fifty barrels of water
10 a day from the southernmost extreme wells.

11 Q Exhibit Four shows considerable acreage between
12 the productive limits and the boundaries of the unit. Is
13 there any provision for that acreage to participate under
14 the unit agreement?

15 A Yes, sir, the surface acreage will participate
16 within the participation formula as five percent.

17 Q Now, Exhibit Four also indicates that part of the
18 Big Eddy area is productive from the Lusk Strawn, why was
19 this acreage not included in the proposed unit agreement?

20 A The Big Eddy Unit is a large unit, it has a
21 multiplicity of owners, in the range of two hundred or so.
22 We visited with the USGS and with their concurrence, we
23 elected to in the interest of time to expedite the formation
24 of the unit through the execution of a border protection
25 agreement between the operators of the Big Eddy Unit and

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1 Llano, Incorporated.

2 Q Have you worked out an agreement, a border protection
3 agreement with the Big Eddy Unit operator?

4 A Yes, sir, we have and it has been executed.

5 Q Essentially what does this provide?

6 A There are three wells which we feel we can and
7 may want to reenter, the 1, the 4 and the 5. And we, through
8 this agreement, have operating rights with respect to the
9 Strawn to produce or to inject or to monitor reservoir
10 performance in any one of the three wells, and additionally
11 the fourth well which is a dry hole on the south extreme
12 of the productive limits.

13 MR. STAMETS: Would you please identify the wells
14 you referred to as 1, 4 and 5?

15 A Yes, sir, the Bass Sun Texas 1.

16 Q (Mr. Hinkle continuing.) What section?

17 A They are in Section 34. The 5 is in 34, the 1
18 and the 5 are in Sections 27 of 19 South and 31 East.

19 MR. STAMETS: That is all of the wells in the Big
20 Eddy Unit that are completed or were completed in the Lusk
21 Strawn Pool?

22 A Yes, sir.

23 MR. STAMETS: Okay, thank you.

24 A And within the confines of the border protection
25 agreement as defined in the agreement.

1 Q (Mr. Hinkle continuing.) Do you have any further
2 comments with respect to Exhibit Four?

3 A No, sir.

4 Q Refer to Exhibit Five and explain what this is?

5 A Exhibit Five is a letter from the Department of
6 the Interior, the Geological Survey, the pertinent portions
7 being as follows: (Reading.) The application filed October
8 23rd, 1973 requested the designation of the Lusk Strawn
9 Deep Unit area embracing twenty thousand, eight hundred and
10 sixty-three point eighty-eight acres in Lea and Eddy Counties,
11 New Mexico, as logically subject to operations under the
12 proposed unit area which embraces eighteen thousand, five
13 hundred and eighty-one point six acres or eighty-nine percent
14 of Federal lands and two thousand, two hundred and eighty-
15 two point twenty-eight acres or ten point nine four percent
16 of New Mexico State lands.

17 It further states: Unitization is for the
18 purpose of conducting secondary recovery operations by
19 injecting extraneous gas and will be limited to the Strawn
20 zone of Pennsylvanian age as defined in Section 2-G of the
21 unit agreement.

22 It continues: The land requested as outlined on
23 your plat, marked Exhibit A, Lusk Strawn Deep Unit in Lea
24 and Eddy Counties, New Mexico is hereby designated as a
25 logical unit area. The designation of the Lusk Strawn Deep

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1 Unit is granted provided the Lusk Deep and Plains Unit
2 agreement which are wholly within the proposed unit area are
3 amended to eliminate the Strawn zone.

4 The proposed form of unit agreement will be
5 acceptable if modified as indicated. (End of reading.)

6 Q So there is attached to that letter, another
7 letter, what does that indicate?

8 A The letter states: (Reading) Your letter of
9 December 14th, 1973 requests preliminary approval for the
10 text of two separately proposed amendments, one each for
11 the Lusk Deep Unit and to the Plains Unit agreement, both
12 in Lea County, New Mexico for the proposed form of consent
13 and ratification to each such amendment.

14 The proposed amendments are proposed to eliminate
15 the Strawn formation from both the Lusk Deep and the Plains
16 Unit agreements while maintaining each such agreement with
17 respect to all other formations.

18 The proposed amendments and form of consent and
19 ratification are satisfactory with this office. (End of
20 reading.)

21 Q Have you obtained these amendments?

22 A Yes, sir, we have.

23 Q They have been executed?

24 A Not entirely. The Lusk Deep Unit which requires
25 an amendment by Gulf, Phillips and Kerr-McGee will be executed

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1 simultaneously with the assignment of their properties to
2 Llano.

3 The Plains Unit, the signing of the amendment
4 will be conducted by Mobile and Clinton. Mobile has signed
5 the amendment and Clinton has it under review.

6 Q Now refer to Exhibit Six and explain this?

7 A Exhibit Six is a letter from the Commissioner of
8 Public Lands which in substance says: (Reading.) Your
9 proposed agreement this date has been approved as to form
10 and as to content. The certain minor changes -- (End of
11 reading.)

12 Q There is attached to this letter another letter
13 under the date of January 11th, what does it show?

14 A The letter of January 11th, 1974 also from the
15 Commissioner of Public Lands withdraws the objections and
16 recommendations as contained in the preceding letter of
17 January 4th, 1974.

18 Q Then the proposed form of unit agreement has been
19 approved by the Commissioner of Public Lands?

20 A Yes, sir.

21 Q Now, three copies of the unit agreement were
22 filed with your application. Are you familiar with that
23 form?

24 A Yes, sir.

25 Q Who is designated as the operator?

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1 A Llano, Incorporated is designated as the unit
2 operator.

3 Q Is this the same form as has been previously
4 approved by the USGS?

5 A Yes, sir.

6 Q And the Commissioner of Public Lands where Federal
7 and State lands are involved?

8 A Yes, sir.

9 Q Does this form provide for a plan of operations?

10 A Yes, sir.

11 Q What does it essentially provide?

12 A This was Exhibit Six?

13 Q No, Section 12 of the unit agreement is the one
14 that provides for the plan of operation.

15 A Section 12 of the unit agreement recognizes that
16 the lands within the unit area are reasonably proven to be
17 productive and unitized substances and the main object and
18 purpose of the agreement is to formulate and to put into
19 effect a secondary recovery project in order to effect the
20 greatest economic recovery of unitized substance and in
21 order to prevent waste. The agreement provides that the
22 initial plan of operation will be filed with the supervisor
23 and the commissioner concurrently with the filing of the
24 agreement for final approval.

25 Q Does the unit agreement provide for a participating

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1 formula?

2 A Yes, sir.

3 Q What is this formula?

4 A The participation formula is based upon five
 5 percent surface acreage, twenty percent productive acreage,
 6 and seventy-five percent net acre feet.

7 Q It is covered by section 13 of the unit agreement?

8 A Yes, sir, it is.

9 Q Do you consider this formula to be fair and
 10 equitable?

11 A Yes, sir, I do.

12 Q And calculated to protect correlative rights?

13 A Yes, sir.

14 Q Have you contacted, or has anyone in your organiza-
 15 tion contacted all of the working-interest owners or owners
 16 of leasehold within the proposed unit area?

17 A Yes, sir, we have.

18 Q And offered an opportunity to commit their acreage
 19 to the unit?

20 A We've offered them an opportunity to commit their
 21 acreage to the unit or to sell it to Llano through purchase
 22 acquisition procedures.

23 Q What percentage of the leasehold interest do you
 24 anticipate will be committed to the unit agreement?

25 A We have what we think are sound commitments now,

1 ninety to eighty-nine percent and we think that ultimately
2 we will have very nearly one hundred percent.

3 Q Now refer to Exhibit Seven and explain what this
4 shows?

5 A Exhibit Seven is a type log and is the log
6 which is referred to in the unit agreement. This log
7 being a gamma ray sonic log on the E' Paso Natural Gas
8 Company Lusk Deep Number 2. It portrays the top of the
9 Strawn and the top of the reef, the base of the reef, the
10 unitized interval which is from eleven thousand and ninety-
11 seven feet to eleven thousand, five hundred and four feet.

12 Q This section is specifically described in the
13 unit agreement as section 2-G, is it not?

14 A Yes, sir.

15 Q Now refer to Exhibits Eight and Nine, together,
16 and explain what these are and what they show?

17 A Exhibit Eight is a well diagram of the proposed
18 injection well, which is the North 2 in the east half of
19 Section 6, the Tenneco Oil Company Continental Federal A-1.
20 This diagrammatic sketch shows where the thirteen and three-
21 eighths casing is set, the eight and five-eighths, the top
22 of the Strawn, the perforated interval, the volume of the
23 cement in each case which is utilized, and it shows the size
24 of the tubing, it shows the previous Wolfcamp perforations
25 which had been perforated, but were also squeezed; and it

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1 shows the packer arrangement; it shows the plugged total
2 depth that exists now in the well bore.

3 Q Now refer to Exhibits Ten and Eleven, are these
4 the logs of the two wells that you have just testified to?

5 A I just testified to Exhibit Eight, but Exhibit Nine
6 which is another exhibit set out diagrammatically, the well
7 bore arrangement, the testimony is essentially similar as
8 to Exhibit Eight.

9 The Exhibits Ten and Eleven are merely the logs
10 on these two well bores, which also have indicated on them
11 the same information as contained in Exhibits Eight and Nine.

12 Q These are the two wells which are to be used
13 initially for the injection of gas?

14 A Yes, sir.

15 Q When do you expect to begin injecting gas into these
16 two wells?

17 A We think since we have the compression already
18 in the yard and the line pipe also in stock that within
19 sixty to ninety days after the effective date of the unit
20 we can begin injection into two wells.

21 Q During that sixty to ninety days what will you
22 be doing?

23 A We will at that time have the well records of
24 all of the parties which are involved in the unit which we
25 have acquired properties from. We will be reviewing these

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1 well records, leading to the well work that will be required,
2 the conversion of additional wells, the rearrangement of
3 equipment in the field and shortly thereafter we will file
4 for an administrative expansion of the project area into
5 the southern and southwestern portion of the unit area.

6 Q Now you have referred to the request for administra-
7 tive approval of additional injection wells, is that quite
8 essential to your program?

9 A We feel that it is in order to expedite it. We,
10 as soon as possible, want to increase our injection rate to
11 sixty million cubic feet per day and we feel that the
12 administrative provisions and procedures which are established
13 by the Commission will move us in that direction in an
14 orderly and rapid fashion.

15 Q Do you have an estimate of the time from the time
16 you begin injecting into the two initial wells, how long it
17 will be until you want administrative approval of additional
18 wells?

19 A Within six months.

20 Q Refer to Exhibit Twelve and explain what this
21 shows?

22 A Exhibit Twelve is a composite production time
23 curve of the Lusk Strawn Deep Unit area which shows the oil
24 production, the bottom hole pressure, the producing oil-gas
25 ratio since the inception of production which was in late

1 1960 through July of 1975. It indicates that the current
2 production rate from the reservoir is thirteen thousand, two
3 hundred barrels of oil per month; it shows a gas-oil ratio
4 of five thousand, seven hundred and an estimated current
5 reservoir pressure in the range of seven hundred pounds.

6 Q Refer to Exhibit Thirteen and explain this?

7 A Exhibit Thirteen is a general data tabulation for
8 the Lusk Strawn Deep Unit area, which shows the reservoir,
9 the age, the average producing depth of eleven thousand,
10 three hundred feet, the discovery date, the discovery well,
11 the current wells which are known as Strawn wells, showing
12 twenty-three producing, sixteen shut down, twenty-eight
13 plugged and abandoned and twenty-seven dry and abandoned.
14 It additionally shows the production rate of thirteen thousand,
15 two hundred and sixty-eight barrels per month, accumulative
16 production from the total reservoir and from the Lusk Strawn
17 Deep Unit area, both being in excess of eighteen million
18 barrels. It goes on to enumerate such items as that and
19 includes fluid property composition, reservoir rock properties,
20 and oil-water contacts which are described on the exhibit.

21 Q Refer to Exhibit Fourteen and explain what this
22 shows?

23 A Exhibit Fourteen is a calculation of original oil
24 in place by two methods, the material balance method, or
25 based on performance, and volumetric method which is essentially

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1 based upon geologic means. Under item one, the material
2 balance, it shows the composite compressibility calculation
3 for the reservoir system; it shows the calculation of the
4 original oil in place in the absence of water influx which
5 seems to be a valid supposition considering performance.
6 The oil in place is estimated to be fifty-four point one
7 million barrels by material balance methods and by the
8 volumetric method the calculation for oil in place is
9 estimated to be forty-four point two million barrels for the
10 total reservoir which includes the Big Eddy Unit area and
11 the Lusk Strawn Deep Unit area of forty-three million barrels.

12 I think that the fifty-four million barrels is
13 the more reasonable figure in view of performance of the
14 reservoir, having accumulated approximately eighteen and a
15 half million barrels to date, and in my opinion the disparity
16 between the two is probably in the porosity measurements
17 since the reservoir not only has inter-crystalline porosity
18 but has secondary porosity of vugular and fracture composi-
19 tion.

20 Q Now refer to Exhibit Fifteen and explain what
21 this shows?

22 A Exhibit Fifteen shows the estimated additional
23 recovery that is anticipated by the project. These numbers
24 are stated in thousands of barrels.

25 Once again the original oil in place was fifty-four

1 million, the accumulative production was approximately
2 eighteen and a half which leaves the remaining oil in place
3 of thirty-five point six million barrels remaining of sixty-
4 five point nine percent.

5 The future remaining primary recovery from August
6 the first of '75 is estimated to be four hundred and ninety-
7 eight thousand barrels. We anticipate that the future
8 pressure maintenance recovery of oil will be four million
9 seven hundred and sixty-two thousand barrels.

10 The future recovery of natural gas liquids, this
11 is a hundred percent from the unit, will be an additional
12 three million, seven hundred and fifty-six thousand for
13 a total future recovery of primary, secondary and natural
14 gas liquids of slightly in excess of nine million barrels.

15 The project would then evidence an increase in
16 recovery of fifteen point seven percent over continued
17 depletion performance.

18 Q Refer to Exhibit Sixteen and explain this exhibit?

19 A Exhibit Sixteen is the estimated future production
20 from the unitized area, cycling at an injection rate of
21 sixty million a day and again the figures are in thousands
22 of barrels, so we can see that over a span of sixteen years
23 the crude oil recovery from the unit is expected to be
24 five million, two hundred and sixty thousand barrels, and
25 the natural gas liquids are five million, two hundred thousand

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1 barrels.

2 It might be pointed out at this time that the
3 first four years that these liquids which amount to a
4 million, four hundred and forty-four thousand barrels are
5 not attributable to the unit, but are extracted from the
6 gas which is processed in the plant and the gas is the
7 extraneous gas which is being purchased outside of the unit
8 confines or unitized interval and will be injected into
9 the formation.

10 The natural gas liquids which are attributable
11 to the unit through the same time period amount to a million,
12 six hundred and ninety thousand barrels on the assumption
13 of forty-five percent of the plant production will be
14 reassigned to the unit, so, therefore, the column four, oil
15 and natural gas liquids to the unit, totalizes six million,
16 nine hundred and fifty barrels.

17 At the bottom of the exhibit is tabulated the
18 economics as we see them, which accrue to the unit, it gives
19 an annual rate of return of fourteen percent, a pay-out
20 period of four and a half years, returning the investment
21 one and a half times.

22 Q Do you have any recommendations to make as to
23 special pool rules which should be adopted?

24 A Yes, we do.

25 Q What are they?

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1 A This is one of them, We only have two copies of
2 these, I think.

3 Our recommendations for special rules and regula-
4 tions for the Lusk Strawn Deep Unit pressure maintenance
5 project in the unit area are, one, the rules and regulations
6 of the Lusk Strawn Pool outside of the project area be
7 retained as written in Order Number R-2175-B which is the
8 one currently in effect.

9 Recommendation two, the initial project area of
10 Llano, Incorporated, Lusk Strawn Deep Unit, consisting of
11 one thousand, seven hundred and sixty acres shall be
12 described as follows and the description is tabulated therein

13 Q And that is the area where the two injection
14 wells are?

15 A The area where the injection wells are located
16 and approximately one mile south.

17 Recommendation three, the allowable for the project
18 area shall be the sum of the allowables of the several wells
19 within the project area, including those wells which are
20 shut in, curtailed or used as injection wells. Allowables
21 for all wells shall be determined as hereafter prescribed.

22 Recommendation four, injection, shut in, or
23 curtailed wells may be transferred to producing wells in
24 the interest of performance efficiencies.

25 And recommendation five, the allowable assigned to

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1 any well on a one hundred and sixty acre proration unit shall
2 be top allowable for the Lusk Strawn Pool.

3 Recommendation six, the allowable assigned to any
4 well which is shut in or curtailed in accordance with
5 recommendation four above, which allowable is to be transferred
6 to any well or wells within the project area for production
7 shall in no event be greater than its ability to produce
8 during the test period described in recommendation seven
9 below, nor will it be any greater than the top unit allowable
10 for the pool during the month of transfer, whichever is
11 less.

12 Recommendation seven, the allowable assigned to
13 any well which is shut in or curtailed in accordance with
14 recommendation four above, shall be determined by a twenty-
15 four hour test at a stabilized production rate which shall
16 be the final twenty-four hour period of a seventy-two hour
17 test during which time the well shall be produced under
18 constant conditions. The daily tolerance limitation set
19 forth in Commission Rule 502-I-A and the limiting GOR, if
20 any, shall be waived during the test periods.

21 The Lusk Strawn Deep Unit project operator shall
22 notify all offset operators offsetting the well, as well
23 as the Commission, of the exact time that such tests are to
24 be conducted. The tests may be witnessed by representatives
25 of the offset operators or by the Commission.

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1 Recommendation eight, the allowable assigned to
2 each producing well in the project area shall be equal to
3 the well's ability to produce or the top unit allowable
4 for the Lusk Strawn Pool, whichever is less, provided that
5 any producing well or wells within the project area which
6 evidence substantial response to gas injection will be
7 permitted to produce up to the project allowable or any
8 proportion thereof. Each producing well within the project
9 area shall be exempt from the Lusk Strawn limiting gas-oil
10 ratio, four thousand to one.

11 Recommendation nine, the conversion of additional
12 producing or shut in wells to injection and the expansion
13 of the project area will be by application and through the
14 administrative approval procedures of the Commission.

15 Q In your opinion will the approval of these
16 applications be in the interest of conservation and the
17 prevention of waste and protect correlative rights?

18 A Yes, sir.

19 MR. HINKLE: We would like to offer Exhibits One
20 through Sixteen.

21 MR. STAMETS: Is there any objection to the
22 admission of any of these exhibits? They will be admitted.

23 MR. HINKLE: That's all of the direct.

24 MR. STAMETS: Any questions of the witness? I
25 think at this time we will take about a fifteen minute recess.

(THEREUPON, a short recess was taken.)

MR. STAMETS: The Hearing will please come to order.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Edwards, in your outline of the project area here, is that basically the two proration units that have injection wells on them and the offsetting proration units?

A Yes, sir, it is a little more than that.

Q Well, if you were to expand the project area, would you propose that that should be the way that it should be expanded, that it would be expanded to include any proration unit on which an injection well is located, plus the offsetting proration unit?

A At least that.

Q Now, you have proposed a formula here for determining the project allowable. At the present time are there any top allowable wells in that pool?

A No, sir, the top allowable is six hundred and five.

Q Is there any reason to limit the project allowable to less than the number of proration units in the project area times the top allowable?

A Is there any reason to limit it to less than?

Q Yes, in other words, the formula that you proposed here, you get the top allowable for an injection well, but

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1 any other well in the project area would only receive an
2 allowable up to its ability to produce.

3 A Right.

4 Q And is there any reason to limit it to that
5 volume?

6 A No, only that each well has to be tested in order
7 to get a future allowable.

8 My proposal is written in such a way that it allows
9 me some flexibility because we do not know the condition
10 of all of the bore holes and I don't know in the future
11 which exactly will be producers and which ones will be
12 injectors. I'm trying to allow for an ample allowable, plus
13 the fact that I have a limited number of wells to work with,
14 and that is going to be further reduced by the number of
15 wells that will be observation wells or injection wells.
16 And then in addition to that, ultimately, you see, we will
17 have a cycling project, so I have to make provisions in there
18 if I'm going to put sixty million a day into the ground,
19 which we propose to do ultimately, I have to have a way to
20 get sixty million back out.

21 Q Let me explain what I was referring to there. Let's
22 assume that you've got a four-well project for the time
23 being, and under your formula you could get a top allowable
24 say for one injection well, then that the other three wells
25 had combined producing capacity of five hundred barrels a

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1 day, you would have something in excess of eleven hundred
2 barrels. I was asking, is there any reason to limit the
3 allowable from the project to less than four times this
4 six hundred barrels a day?

5 A No, sir.

6 Q Which would be more than you would have requested
7 here, but still would be no more than the wells would be
8 allowed under primary conditions?

9 A That's right.

10 Q On Exhibit Number Sixteen, column two, if I
11 understand this correctly, now you would allocate forty-five
12 percent of the plant-produced liquids for the first four
13 years?

14 A No, sir. Column two represents one hundred percent
15 of the production from the plant. During the first four
16 years, which are designated by footnote five. This will be
17 the period of time when gas is coming in from extraneous
18 sources and will be going into the reservoir at the rate of
19 approximately sixty million a day. The unit wouldn't share
20 in that gas because it is an outside gas volume. This is
21 the total plant production entirely in column two, the first
22 four years being the pressure build-up time when we are
23 trying to get up to an operating pressure of four thousand
24 pounds.

25 Q Would the produced gas from the field be going

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1 through the plant during this period of time?

2 A Yes, sir.

3 Q And would any allocation of those liquids go to
4 the unit during this period of time?

5 A Yes, a small percentage would be. The field right
6 now is only producing about two million a day from the
7 Strawn.

8 Q In actuality then, in column three would there be
9 a small volume?

10 A In column three there would be a very small number
11 there, which would be forty-five percent of the liquids
12 extracted from whatever the indigenous gas volume was.

13 Q You are looking at a four year fill up program
14 and then you would be siphoning gas from the reservoir?

15 A Right.

16 Q Referring to Exhibits Eight and Nine, you show
17 the annular space filled with inhibited fluid on the two
18 injectors and a pressure gauge on the surface, is this the
19 method you propose to use to determine leakage?

20 A Yes, sir.

21 Q Is the tubing treated in any way, or is there any
22 necessity to treat it for corrosion?

23 A We've considered that, but the extraneous gas
24 is sweet gas and the reservoir gas and the reservoir fluids
25 are not sour.

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1 Q Now, earlier in the testimony you indicated that
2 you would be injecting high on the structure and producing
3 low on the structure, and I would presume that initially you
4 are referring to your project area?

5 A In any event that would be the case. Initially
6 we would be referring to the project area.

7 Q Okay. Referring to the Big Eddy Unit, will the
8 production from those wells commingle with the unit production,
9 totally allocated to the Big Eddy; you talk about a border
10 protection agreement and I would like just a brief descrip-
11 tion of how that works?

12 A The Big Eddy border protection agreement permits
13 the Big Eddy Unit to share in the same proportion the liquid
14 and gas production from the unit, as though it had been in
15 the unit.

16 Q As if this were a single lease?

17 A Yes, sir. That is in the event that we do not
18 produce the well. If we produce the wells then it shares in
19 proportion, the production is allocated back to the lease
20 in the respective cases and they have an override on it and
21 we have the balance.

22 Q What will your injection pressures be?

23 A A maximum of forty-five hundred pounds.

24 Q And what reservoir pressure do you intend to
25 build back up to?

1. We intend to operate at four thousand to forty-two hundred pounds, which is essentially the saturation pressure initially. The initial bubble point was four one seven three so somewhere right in that range.

MR. STAMETS: Are there any other questions of this witness?

MR. HINKLE: Mr. Examiner, we have the original logs, the logs that were marked exhibits are just Xerox copies. If you would like to have the full log of the two injection wells we have them here, and we also have another copy of the recommended special pool rules if you would like to have those.

MR. STAMETS: We have two copies of the rules at this time.

MR. HINKLE: Would you like to have those originals?

MR. STAMETS: No, I believe those logs in the Commission's files and the exhibits that were presented should be sufficient.

MR. HINKLE: That is all we have.

MR. STAMETS: The witness may be excused. Anything further in this Case? We will take the case under advisement.

I would like to announce that Case 5551 will be heard as the last case today before Examiner Nutter.

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State of New Mexico)
) ss.
County of Santa Fe)

I, SIDNEY F. MORRISH, a court reporter, do hereby
certify that the foregoing and attached Transcript of Hearing
before the New Mexico Oil Conservation Commission was reported
by me, and the same is a true and correct record of the said
proceedings to the best of my knowledge, skill and ability.

Sidney F. Morrish
Sidney F. Morrish, Court Reporter

I do hereby certify that the foregoing is
a complete record of the proceedings in
the Examiner hearing No. 5563-5564
heard by me on 10-8-1975.
Richard L. Stank, Examiner
New Mexico Oil Conservation Commission

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LUSK STRAWN DEEP UNIT
PROJECT AREA

Recommendations for Special Rules and Regulations for the - Llano, Inc. Lusk Strawn Deep Unit Pressure Maintenance Project and Unit Area:

- Rec. 1. Rules and regulations for Lusk Strawn Pool outside of project area be retained as written in Order No. R-2175-B.
- Rec. 2. ⁱⁿ The project area of the Llano, Inc. Lusk Strawn Deep Unit consisting of 1760 Acres shall be described as follows:

LEA COUNTY, NEW MEXICO

Township 18 South, Range 32 East, NMPM

Section 31: SE/4
Section 32: SW/4

Township 19 South, Range 32 East, NMPM

Section 5: W/2
Section 6: E/2
Section 7: N/2
Section 8: W/2

EDDY COUNTY, NEW MEXICO

Township 19 South, Range 31 East, NMPM

Section 12: NE/4

- Rec. 3. The allowable for the project shall be the sum of the allowables of the several wells within the project area including those wells which are shut-in, curtailed or used as injection wells. Allowables for all wells shall be determined as hereafter prescribed.
- Rec. 4. Allowables for injection, shut-in or curtailed wells may be transferred to producing wells in the interest of performance efficiencies.
- Rec. 5. The allowable assigned to any injection well on a 160 Acre proration unit shall be top unit allowable for the Lusk Strawn Pool.

- Rec. 6. The allowable assigned to any well which is shut-in or curtailed in accordance with Rec. 4. above which allowable is to be transferred to any well or wells within the project area for production, shall in no event be greater than its ability to produce during the test period prescribed in Rec. 7., below, nor will it be any greater than the top unit allowable for the Pool during the month of transfer, whichever is less.
- Rec. 7. The allowable assigned to any well which is shut-in or curtailed in accordance with Rec. 4. above shall be determined by a 24 hour test at a stabilized production rate which shall be the final 24 hour period of a 72 hour test during which time the well shall be produced under constant conditions. The daily tolerance limitation set forth in Commission Rule 502-I-a and the limiting GOR, if any, shall be waived during such tests. The Lusk Strawn Deep Unit project operator shall notify all operators offsetting the well, as well as the Commission, of the exact time such tests are to be conducted. Tests may be witnessed by representatives of offset operators and the Commission.
- Rec. 8. The allowable assigned to each producing well in the project area shall be equal to the well's ability to produce or to top unit allowable for the Lusk Strawn Pool, whichever is less, provided that any producing well or wells within the project area which evidence substantial response to gas injection shall be permitted to produce up to the project allowable or any proportion thereof. Each producing well within the project area shall be exempt from the Lusk Strawn Pool limiting gas-oil-ratio of 4000 - 1.
- Rec. 9. The conversion of additional producing or shut-in wells to injection and the expansion of the project area shall be by application and through administrative approval procedures of the Commission.

LLANO, INC.

**Lusk Strawn Deep Unit
Pressure Maintenance Project
Lea & Eddy Counties, New Mexico**

Exhibits 1 - 16

NMOCC Hearing

October 8, 1975

EXHIBIT 1 - GENERAL LAND PLAT

EXHIBIT 2 - GENERAL WELL PLAT

EXHIBIT 3 - STRAWN AND MORROW WELL PLAT

EXHIBIT 4 - ISOPOCHOUS PLAT

EXHIBIT 5 - U.S.G.S. TENTATIVE APPROVAL

EXHIBIT 6 - COMMISSIONER OF PUBLIC LAND APPROVAL

EXHIBIT 7 - UNITIZED INTERVAL

EXHIBIT 8 - DOWNHOLE SCHEMATICS - CONTINENTAL FEDERAL UNIT A#1

EXHIBIT 9 - DOWNHOLE SCHEMATICS - CONTINENTAL FEDERAL COM. #1

EXHIBIT 10 - LOG OF DOWNHOLE SCHEMATICS - CONTINENTAL FEDERAL UNIT A#1

EXHIBIT 11 - LOG OF DOWNHOLE SCHEMATICS - CONTINENTAL FEDERAL COM. #1

EXHIBIT 12 - COMPOSITE PRODUCTION - TIME CURVE

EXHIBIT 13 - GENERAL DATA

EXHIBIT 14 - CALCULATION OF OIL-IN-PLACE

EXHIBIT 15 - ESTIMATED ADDITIONAL RECOVERY

EXHIBIT 16 - ESTIMATED FUTURE PRODUCTION



IN REPLY REFER TO:

United States Department of the Interior

GEOLOGICAL SURVEY

Denver Federal Center

Denver, Colorado 80225

Ex. No. 5

RECEIVED December 6, 1973

DEC 10 1973

Hinkle, Bondurant, Cox & Eaton
P. O. Box 10
Roswell, New Mexico 88201

HINKLE, BONDURANT, COX & EATON
ROSWELL, NEW MEXICO

Gentlemen:

Your application filed October 23, 1973, on behalf of Llano, Inc., requests the designation of the Lusk Strawn Deep unit area embracing 20,863.88 acres, Lea and Eddy Counties, New Mexico, as logically subject to operation under the unitization provisions of the Mineral Leasing Act, as amended. The proposed unit area embraces 18,581.60 acres (89.06 percent) of Federal land and 2,282.28 acres (10.94 percent) of New Mexico State land.

Unitization is for the purpose of conducting secondary recovery operations by injecting extraneous gas and will be limited to the Strawn zone of Pennsylvanian age defined by Section 2(g) of the unit agreement. The proposed unit area has been developed by 65 wells completed in the formation to be unitized. Participation will be based on a single phase formula consisting of 5 percent surface acres, 20 percent productive acres, and 75 percent net acre-feet. You estimate that secondary recovery operations will result in the recovery of an additional 10,175,000 total equivalent barrels of oil.

The land requested, as outlined on your plat marked "Exhibit A, Lusk Strawn Deep Unit, Lea and Eddy Counties, New Mexico" is hereby designated as a logical unit area. The designation of the Lusk Strawn Deep Unit is granted provided the Lusk Deep and Plains unit agreements, which are wholly within the proposed unit area, are amended to eliminate the Strawn zone of Pennsylvanian age prior to filing the proposed unit agreement for final approval. Your proposed form of unit agreement will be acceptable if modified as indicated. One marked copy of the form is returned herewith and one copy is being sent to the Oil and Gas Supervisor, Roswell, New Mexico. We hereby concur in the Supervisor's recommendation that the proposed basis for allocating unitized production be accepted.

The format of the sample exhibits attached to the 1968 reprint of the Form of Unit Agreement for Unproved Areas should be followed closely, including the latest status of all acreage, in the preparation of Exhibits A, B, and C.

In the absence of any objection not now apparent, a duly executed agreement conformed to the returned copy and approved by the appropriate officials of the State of New Mexico will be approved if submitted in approvable status within a reasonable period of time. However, the right is reserved to deny approval of any executed agreement that, in our opinion, does not have full commitment of sufficient lands to afford effective control of operations in the unit area.

As the unit area contains State of New Mexico lands, we are sending a copy of this letter to the Commissioner of Public Lands of the State of New Mexico in Santa Fe. Please contact the State of New Mexico before soliciting joinders, regardless of prior contacts with or clearances from the State.

Sincerely yours,

George H. Horn
Conservation Manager, Central Region
For the Director



IN REPLY REFER TO:

United States Department of the Interior

GEOLOGICAL SURVEY
Denver Federal Center
Denver, Colorado 80225

RECEIVED

JAN 21 1974

HINKLE, BONDURANT, COX & EATON
ROSWELL, NEW MEXICO

JAN 18 1974

Mr. Clarence E. Hinkle
Hinkle, Bondurant, Cox and Eaton
P.O. Box 10
Roswell, New Mexico 88201

Dear Mr. Hinkle:

Your letter of December 14, 1973, requests preliminary approval for the text of two separately proposed amendments, one each to the Lusk Deep unit agreement and to the Plains unit agreement, both in Lea County, New Mexico, and for a proposed form of Consent and Ratification to each such amendment.

The proposed amendments are designed to eliminate the Strawn formation from both the Lusk Deep and Plains unit agreements while maintaining each such agreement with respect to all other formations. Such action is necessary to facilitate the commitment of certain interests in both the Lusk Deep and Plains unit areas to the Lusk Strawn Deep unit agreement.

The proposed amendments and forms of "Consent and Ratification" are satisfactory to this office and such amendments, properly executed on the proposed signatory instruments, should be filed concurrently with the request for final approval of the Lusk Strawn Deep unit agreement.

Sincerely yours,

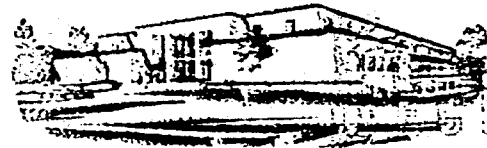
George H. Horn
Conservation Manager, Central Region
For the Director

cc:
El Paso Products Company
P.O. Box 3986
Odessa, Texas 79760

Perry R. Bass
Fort Worth National Bank Bldg.
Fort Worth, Texas 76102



ALEX J. ARMIJO
COMMISSIONER



Commissioner of Public Lands

January 4, 1974

Ex. No. 6

HINKLE, BONDURANT, COX & EATON
ROSWELL, NEW MEXICO
P. O. BOX 1148
SANTA FE, NEW MEXICO

Hinkle, Bondurant, Cox & Eaton
600 Hinkle Building
P. O. Box 10
Roswell, New Mexico 88201

Re: Llano, Inc.'s
Proposed Lusk Strawn Deep Unit
Lea and Eddy Counties, New Mexico

ATTENTION: Mr. Clarence E. Hinkle

Gentlemen:

We have reviewed the proposed unexecuted copy of unit agreement, Exhibits "A" and "B" for the Lusk Strawn Deep Unit. The form of agreement meets with the requirements of the Commissioner of Public Lands with a few minor changes as outlined below.

Under Section 24 (EFFECTIVE DATE AND TERM), lines 1 and 6, page 26, we would like for you to change the wording from "can be produced" to "are produced". Enclosed is copy of page 26 reflecting such change.

Your Exhibits "A" and "B" require a few changes also. Under Tract 95 the Lessee of Record should be Cities Service Oil Company, under Tract 100 the new Lease is LG-1477 which was bought by Amoco Production Company, under Tract 105 it should show assignment one and is owned by Harland Oil Corporation, under Tract 107 it should show assignment one and is owned by Coronet Trading Corporation. Enclosed are pages 10 and 11 of the Exhibit "B" reflecting such changes.

Your proposed agreement has this date been approved as to Form and Content, subject to the changes as outlined in Paragraphs 2 and 3.

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

1. Application for final approval stating all Tracts committed and tracts not committed.
2. Two executed copies of Unit Agreement-one must be an original.
3. One executed copy of Operating Agreement, with ratifications
4. Two copies of all ratifications from Lessees of Record and Working Interest Owners, one must be an original.

Hinkle, Bondurant, Cox & Eaton
January 4, 1974
Page 2.

5. Final Drafts of Exhibits "A" and "B".

We are in receipt of your Two Hundred and Thirty (\$230.00) Dollars for the filing fee, however, the filing fee is ten dollars for each section or fraction part thereof, whether the acreage is federal, state or privately owned. Therefore, please remit another Two Hundred and Thirty (\$230.00) Dollars.

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

Very truly yours,

Ray D. Graham

RAY D. GRAHAM, Director
Oil and Gas Division

AJA/RDG/s
encls.
cc:

United States Geological Survey
P. O. Drawer 1857
Roswell, New Mexico
(ATTENTION: Mr. Carl Traywick)

State of New Mexico

TELEPHONE
505-827-2748



ALEX J. ARMIJO
COMMISSIONER



Commissioner of Public Lands

January 11, 1974

RECEIVED

JAN 12 1974

HINKLE, BONDURANT, COX & EATON
ROSWELL, NEW MEXICO
P. O. Box 1148
SANTA FE, NEW MEXICO

Hinkle, Bondurant, Cox & Eaton
600 Hinkle Building
P. O. Box 10
Roswell, New Mexico 88201

Re: Llano Inc.'s proposed Lusk
Strawn Deep Unit, Lea and
Eddy Counties, New Mexico

Dear Mr. Hinkle:

Please refer to our letter of January 4, 1974, concerning suggested changes in the proposed subject unit agreement. Paragraph 2 of said letter requested changes in lines 1 and 6, on page 26, from the wording "can be produced" to "are produced".

Due to the terms and regulations of Federal leases and Unit Agreements, we are hereby withdrawing this requested change and consent to the wording "can be produced" to be left in the Unit Agreement insofar as it affects this Unit Agreement.

Very truly yours,

Ray D. Graham

RAY D. GRAHAM, Director
Oil and Gas Division

AJA/RDG/s
cc:

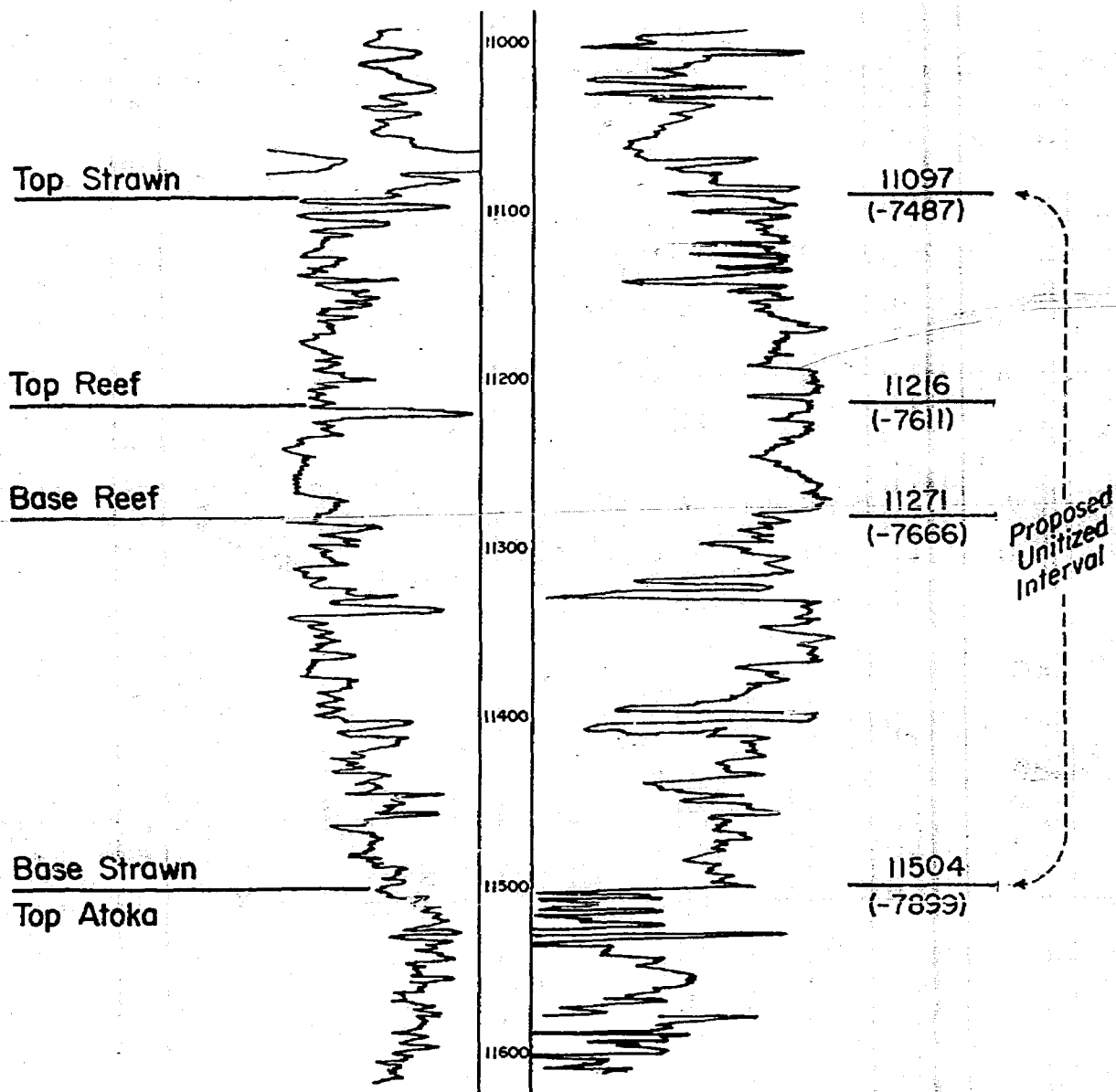
Llano, Inc.
P. O. Drawer 1320
Hobbs, New Mexico 88240

United States Geological Survey
P. O. Drawer 1857
Roswell, New Mexico 88201
(ATTENTION: Mr. Carl Traywick)

TYPE LOG OF THE INTERVAL OF UNITIZATION

LUSK STRAWN DEEP UNIT
PRESSURE MAINTENANCE PROJECT
EDDY & LEA COUNTIES, NEW MEXICO
RECOMMENDED VERTICAL INTERVAL
OF UNITIZATION

EL PASO NATURAL GAS CO.
LUSK DEEP UNIT No. 2
Unit O, Sec. 18, T-19-S, R-32-E
NMPM, Lea County, New Mexico
VERTICAL SCALE: 1" = 100'



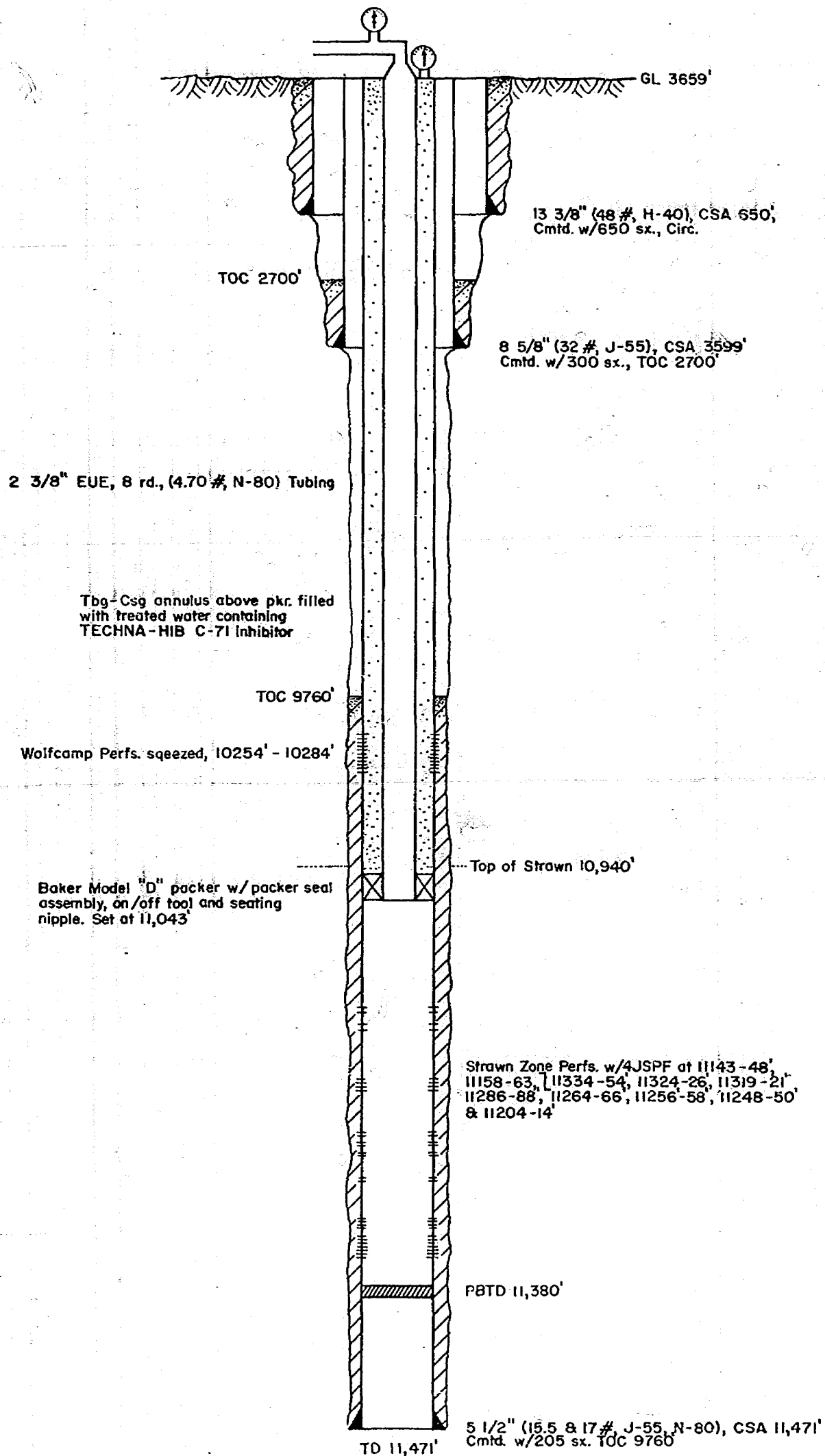
GAMMA RAY - SONIC LOG

Ex. No. 7

LLANO, INC
LUSK STRAWN DEEP UNIT
PROPOSED INITIAL INJECTOR

Ex. No. 8

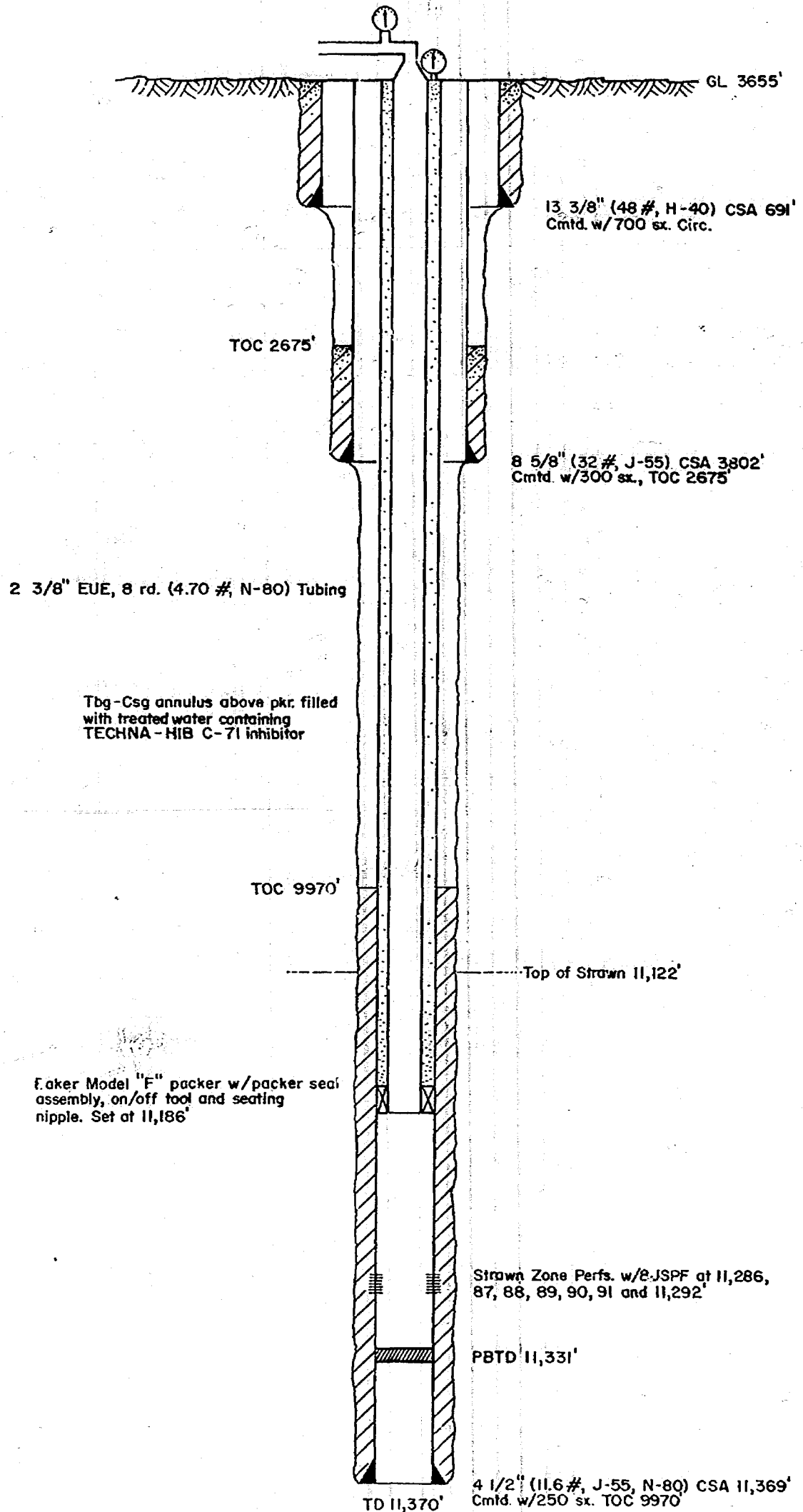
TENNECO OIL COMPANY
CONTINENTAL FEDERAL UNIT "A" No. 1
1980' FNL & 1650' FEL, Sec. 6, T-19-S, R-32-E
NMPM, LEA COUNTY, NEW MEXICO

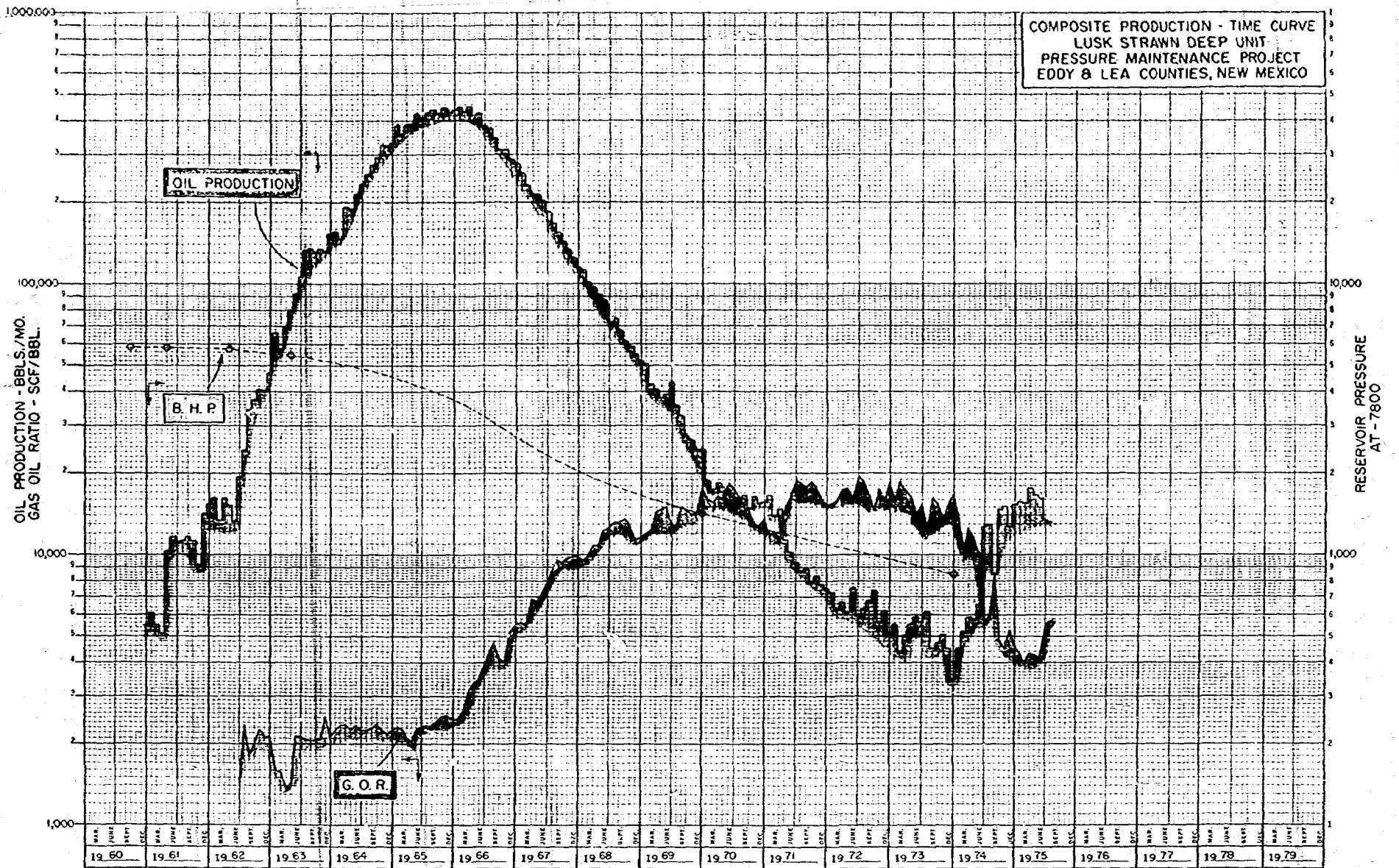


LLANO, INC.
LUSK STRAWN DEEP UNIT
PROPOSED INITIAL INJECTOR

Ex. No. 9

TENNECO OIL COMPANY
CONTINENTAL FEDERAL COM. No. 1
660' FSL & 1980' FEL, Sec. 6, T-19-S, R-32-E
NMPM, LEA COUNTY, NEW MEXICO





LUSK STRAWN DEEP UNIT
Lea and Eddy Counties, New Mexico
GENERAL DATA

Reservoir	Strawn Reef
Age	Pennsylvanian
Average Producing Depth	11,300'
Discovery Date	October, 1960
Discovery Well	El Paso Products Lusk Deep A-1
Current Wells	
(August 1, 1975) Strawn	Producing 23
	Shut-Down 16
	P & A 28
	D & A 27
Current Reservoir Producing Rate - August 1, 1975	13,268 BBL/Month
Cummulative Production Total Reservoir - August 1, 1975	18,470,000 BBLs
Cummulative Production Lusk Strawn Deep Unit	18,011,000
Cummulative Production Big Eddy Unit	459,000
Proposed Unit Areal Extent	20,863.88 Acres
Productive Area, Unit	11,461.12 Acres
Reservoir Volume, Unit	352,848.00 Acre-ft.
Average Net Productive Thickness, Unit	30.79 Feet
Reservoir Temperature	169.0°F
Reservoir Pressure, Initial @ - 7800'	5862 psi
Saturation Pressure, @ 169°F	4173 psi
Fluid Properties:	
FVF @ Initial Pressure	2.152
FVF @ Saturation Pressure	2.254
Initial Gravity of the Oil, API	48°
Initial Solution GOR	2359-1
Reservoir Rock Properties:	
Porosity	4.85 percent
Interstitial Water Saturation	30.40 percent
Average Permeability	21.60 millidarcies
Oil Water Contracts - Eastern Flank	7950
Southeastern	8000
Southern	7915
Southwest	8000

Ex. No. 13

LUSK STRAWN DEEP UNIT
Lea and Eddy Counties, New Mexico
LLANO, INC.

CALCULATIONS OF ORIGINAL OIL-IN-PLACE, BY:

I. MATERIAL BALANCE:

$$\text{Composite Compressibility} = C_e = \frac{C_o S_o + C_w S_w + C_f}{S_o}$$

$$C_o @ 5017 \text{ psi (average pressure orig. to bubble point)} = 26.0 \times 10^{-6}$$

$$C_w @ 5017 \text{ psi and } 169^\circ \text{F} = 3.2 \times 10^{-6}$$

$$C_f, \text{ Penn Reef, porosity } 4.85\% = 6.5 \times 10^{-6}$$

$$S_w = .304, S_o = .696$$

$$C_e = \frac{(26)(0.696) + (3.2)(0.304) + 6.5}{0.696} \times 10^{-6} = 36.7 \times 10^{-6}$$

$$N = \frac{N_p B_o + (W_p - W_e)}{C_e (P_i - P_{bp}) B_{oi}}$$

N = Original Oil-in-Place

N_p = Production to B_p = 3.2×10^6

B_o = FVF @ B_p = 2.254

W_p = Water Prod = 0

W_e = Influx = 0

C_e = Composite Compressibility

P_i = Orig. press = 5862

P_{bp} = Bubble point

Press = 4173

B_{oi} = Initial FVF = 2.152

$$N = \frac{3.2 \times 10^6 \times 2.254 + 0}{36.7 \times 10^{-6} (5862 - 4173) \times 2.152} = \frac{7.2128 \times 10^6}{133394.5 \times 10^{-6}} = 54.1 \text{ Million Barrels}$$

II. VOLUMETRIC:

$$\text{Porosity} = 4.85\%$$

$$S_w = 30.40\%$$

$$B_{oi} = 2.152$$

$$\text{Reservoir Volume} = 363493 \text{ AF Total}$$

$$\text{Lusk Strawn Deep Unit} = 352848 \text{ AF or } 97.1\%$$

$$\frac{7758 \times (1 - S_w) \times \emptyset}{B_{oi}} = \text{BBLs/AF Original-in-Place}$$

$$\frac{7758 \times .696 \times .0485}{2.152} = 122$$

TOTAL RESERVOIR:

$$363493 \times 122 = 44.2 \text{ Million Barrels Original-in-Place}$$

LUSK STRAWN DEEP UNIT AREA:

$$352848 \times 122 = 43.0 \text{ Million Barrels Original-in-Place}$$

NOTE: Elected to use material balance calculation of 54.1 Million Barrels as Original Oil-in-Place.

Ex. No. 14

LUSK STRAWN DEEP UNIT - PRESSURE MAINTENANCE PROJECT
Lea and Eddy Counties, New Mexico

1000's Stock Tank Barrels
Estimated Additional Recovery by Pressure Maintenance

		<u>% OOIP</u>	<u>Cum. %</u>
Original Oil-in-Place	54,100	100.0	-
Cumulative Recovery August 1, 1975	18,470	34.1	34.1
Remaining Oil-in-Place	35,630	65.9	-
Future Primary Recovery August 1, 1975	498	0.9	35.0
Future Pressure Maintenance Recovery Oil	4,762	8.8	43.8
Future Recovery, NGL	3,756	6.9	50.7
Total Future Recovery Oil, NGL	9,016	16.6	-

Increase Due to Unitization and Pressure Maintenance Project $\frac{9016-498}{54100} = 15.7\%$

(Excluding 1,444,000 BBLS NGL From Extraneous Gas)

NOTE: Above determination predicates a cycling rate of 60 MMCFD with reservoir operating at 4000 psi with cumulative injection of 345 BCF over a 16 year period.

Ex. No. 15

LUSK STRAWN DEEP UNIT - PRESSURE MAINTENANCE PROJECT
Lea and Eddy Counties, New Mexico

Estimated Future Production @ 60 MMCFD Injection
1000's Barrels

Year	(1) Crude Oil Unit Recovery	(2) Natural Gas Liquids Plant Recovery	(3) NGL To Unit	(4) Oil and NGL To Unit
1	200	244 (5)	-	200
2	350	400 (5)	-	350
3	760	400 (5)	-	760
4	785	400 (5)	-	785
5	815	567	255	1070
6	550	500	225	775
7	390	444	200	590
8	280	422	190	470
9	220	400	180	400
10	190	378	170	360
11	170	356	160	330
12	150	356	160	310
13	130	222	100	230
14	120	111	50	170
15	100	-	-	100
16	50	-	-	50
Total	5260	5200	1690	6950

- (1) Includes primary and pressure maintenance recoveries.
 (2) Total liquids recovered in Plant.
 (3) Allocation of 45% of plant liquids to unit.
 (4) Total recovery to unit: column (1) plus column (3).
 (5) Liquids recovered from extraneous gas total 1,444,000 BBLs as a result of implementation of project.

Economics Accruing to Unit

Average Annual Rate of Return, %	14.0
Payout Period, Years	4.5
Number of Times Investment Returned	1.5

Ex. No. 16

- CASE 5564: Application of Llano, Inc. for a pressure maintenance project, Lea and Eddy Counties, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a pilot pressure maintenance project in the Lusk Strawn Pool, Lea and Eddy Counties, New Mexico, by the injection of gas into the Strawn formation through two wells in its Lusk Strawn Deep Unit Area. Applicant further seeks rules governing said project, including but not limited to provision for expansion of the project area, placing additional wells on injection, changes in injection pattern for sweep efficiency and determination of project allowable.
- CASE 5565: Application of Atlantic Richfield Company for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project in the Vacuum Grayburg-San Andres Pool by injection of water through seven wells on its State "B" and State "C" Leases, six of said wells being converted producers located in Units C, E, I, K, M, and O of Section 32, Township 17 South, Range 34 East, Lea County, New Mexico, and the seventh being a new well drilled at an unorthodox location 250 feet from the South line and 2250 feet from the West line of said Section 32. Applicant further seeks an administrative procedure whereby the project area could be expanded and additional wells at standard and non-standard locations put on injection and production.
- CASE 5566: Application of James P. Graham for a non-standard proration unit and compulsory pooling, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests underlying a non-standard oil proration unit comprising the SW/4 NE/4 SE/4, NW/4 SE/4 SE/4, NE/4 SW/4 SE/4, and the SE/4 NW/4 SE/4 of Section 12, Township 13 South, Range 31 East, Caprock Queen Pool, Chaves County, New Mexico, to be dedicated to a well to be drilled at an unorthodox location 1340 feet from the South line and 1300 feet from the East line of said Section 12, said location having been previously been approved by Order No. R-4750. Also to be considered will be the cost of drilling and completing said well and the allocation of such costs, as well as actual operating costs and charges for supervision. Also to be considered is the designation of applicant as operator of the well and a charge for risk involved in drilling said well.
- CASE 5567: Application of Belco Petroleum Corporation for compulsory pooling and an unorthodox location, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks an order pooling all mineral interests in the Pennsylvanian formation underlying the W/2 of Section 5, Township 22 South, Range 27 East, Eddy County, New Mexico, to be dedicated to a well to be drilled at an unorthodox location 660 feet from the South line and 1980 feet from the West line of said Section 5. Also to be considered will be the cost of drilling and completing said well and the allocation of the cost thereof, as well as actual operating costs and charges for supervision. Also to be considered will be the designation of the applicant as the operator of the well and a charge for the risk involved in drilling said well.

LAW OFFICES

HINKLE, BONDURANT, COX & EATON

TELEPHONE (505) 622-6510

CURENCE E. HINKLE
W. E. BONDURANT, JR. (RM-1973)
LEWIS C. COX, JR.
PAUL W. EATON, JR.
CONRAD E. COFFIELD
HAROLD L. HENSLEY, JR.
STUART D. SHANOR
C. D. MARTIN
PAUL J. KELLY, JR.

600 HINKLE BUILDING

POST OFFICE BOX 10

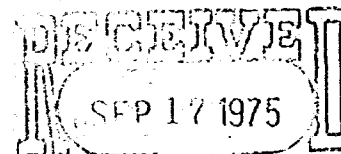
ROSWELL, NEW MEXICO 86201

September 16, 1975

MR. ISBELL LICENSED
IN TEXAS ONLY

MIDLAND, TEXAS OFFICE
521 MIDLAND TOWER
(915) 683-4691

JAMES H. BOZARTH
RONALD G. HARRIS
JAMES H. ISBELL



OIL CONSERVATION COMM.
Santa Fe

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Gentlemen:

In connection with the Lusk Strawn Deep Unit Agreement we enclose herewith in triplicate application for approval of the unit agreement, together with three copies of the unit agreement.

We also enclose in triplicate application for approval of a pressure maintenance project in connection with the Lusk Strawn Deep Unit Area, together with logs of the two initial injection wells.

We have requested that these two applications be placed on the examiner's docket for the hearing on October 8, 1975.

Yours very truly,

HINKLE, BONDURANT, COX & EATON

BY

Clarence E. Hinkle

ad

CEH:cs
Enc.

cc: Llano, Inc.

Hinkle

Related

Press Drain Proj
Kink Stn Daily Bu

incl 2 gasinj
wells

inj pilot proj

adm proc

exp proj

add inj wells

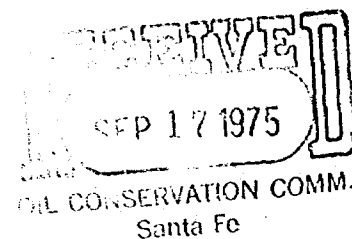
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BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF LLANO, INC. FOR APPROVAL OF A PRESSURE MAINTENANCE PROJECT FOR THE LUSK STRAWN POOL TO BE EMBRACED WITHIN THE LUSK STRAWN DEEP UNIT AREA CONSISTING OF 20,863.88 ACRES OF FEDERAL AND STATE LANDS IN TOWNSHIPS 18, 19 AND 20 SOUTH, RANGES 31 AND 32 EAST, LEA AND EDDY COUNTIES, NEW MEXICO, INCLUDING TWO GAS INJECTION WELLS FOR THE PURPOSE OF INITIATING A PILOT PROJECT. APPLICANT ALSO SEEKS ESTABLISHMENT OF ADMINISTRATIVE PROCEDURE WHEREBY THE PILOT PROJECT MAY BE EXPANDED FROM TIME TO TIME BY THE CONVERSION OF ADDITIONAL PRODUCING WELLS TO INJECTION WELLS OR TO MAKE ANY CHANGES IN THE INJECTION PATTERN WHICH MAY BECOME NECESSARY; ALSO FOR THE APPROVAL OF SPECIAL POOL RULES INCLUDING A PROJECT ALLOWABLE.



Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Comes Llano, Inc. acting by and through the undersigned attorneys and hereby makes application for approval of a pressure maintenance project for the Lusk Strawn Pool to be embraced within the Lusk Strawn Deep Unit Area consisting of 20,863.88 acres of federal and state lands in Townships 18, 19 and 20 South, Ranges 31 and 32 East, Lea and Eddy Counties, New Mexico, including two gas injection wells for the purpose of initiating a pilot project. Applicant also seeks establishment of administrative procedure whereby the pilot project may be expanded from time to time by the conversion of additional producing wells to injection wells or to make any changes in the injection pattern which may become necessary; also for the approval of special pool rules including a project allowable, and in support thereof respectfully shows:

1. There is attached hereto as Exhibit "A" a plat showing the outlines of the Lusk Strawn Deep Unit Area which also shows the character of the lands, of which 18,581.60 acre or 89.061% are federal lands and 2,282.28 acres or 10.939% are state lands.

2. As indicated on Exhibit "A" there are two proposed injection wells, both of which are situated within Section 6, Township 19 South,

Range 32 East. These wells are to be used initially for a pilot project for the injection of gas into the unitized formation which is defined as the vertical interval from 11,097 feet to 11,504 feet on the Schlumberger Gamma Ray-Sonic Log run in the El Paso Natural Gas Company Lusk Deep No. 2 well located in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 18, Township 19 South, Range 32 East, N.M.P.M. It is contemplated that between six and ten million cubic feet of gas per day will be injected into these wells initially and that the project area will be expanded from time to time to cover the entire unit area and ultimately there will be injected approximately sixty million cubic feet of gas per day.

3. There are attached hereto as Exhibits "B" and "C" diagrammatic sketches of the two proposed injection wells, one being the Continental Fed. Com. No. 1 located 660 feet from the south line and 1980 feet from the east line of Section 6 and the other the Continental Federal Unit "A" No. 1 well located 1980 feet from the north line and 1650 feet from the east line of said Section 6. Said diagrammatic sketches show all casing strings including diameters and setting depths, quantities used and tops of cement, perforated intervals, tubing strings, setting depths and types and location of packers to be used.

4. The proposed pressure maintenance project is within the boundaries of the proposed Lusk Strawn Deep Unit Area and applicant has filed a separate application for approval of the Lusk Strawn Deep Unit Agreement by the Commission.

5. Applicant also desires that a project allowable be approved in accordance with Rule 701 of the Commission and that special pool rules be adopted, as well as provision for the administrative approval of the conversion of additional wells for gas injection purposes or the drilling of new wells for such purpose.

6. There are also filed herewith copies of the Sonic Log-Gamma Ray of the two wells above referred to which are to be used for gas injection purposes.

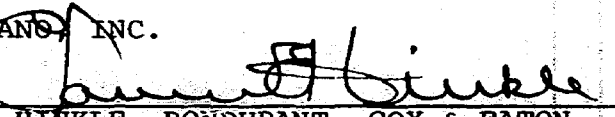
7. In the opinion of applicant the pressure maintenance project will be in the interest of conservation and the prevention of waste as well as the protection of correlative rights and will tend to promote the greatest ultimate recovery of oil and gas from the Lusk Strawn Field or Pool.

8. Applicant requests that this matter be included on the examiner's docket for October 8, 1975.

Respectfully submitted,

LLANO, INC.

BY


HINKLE, BONDURANT, COX & EATON
P.O. Box 10
Roswell, New Mexico 88201
Attorneys for Applicant

DOCKET MAILED

Date 9/26/75

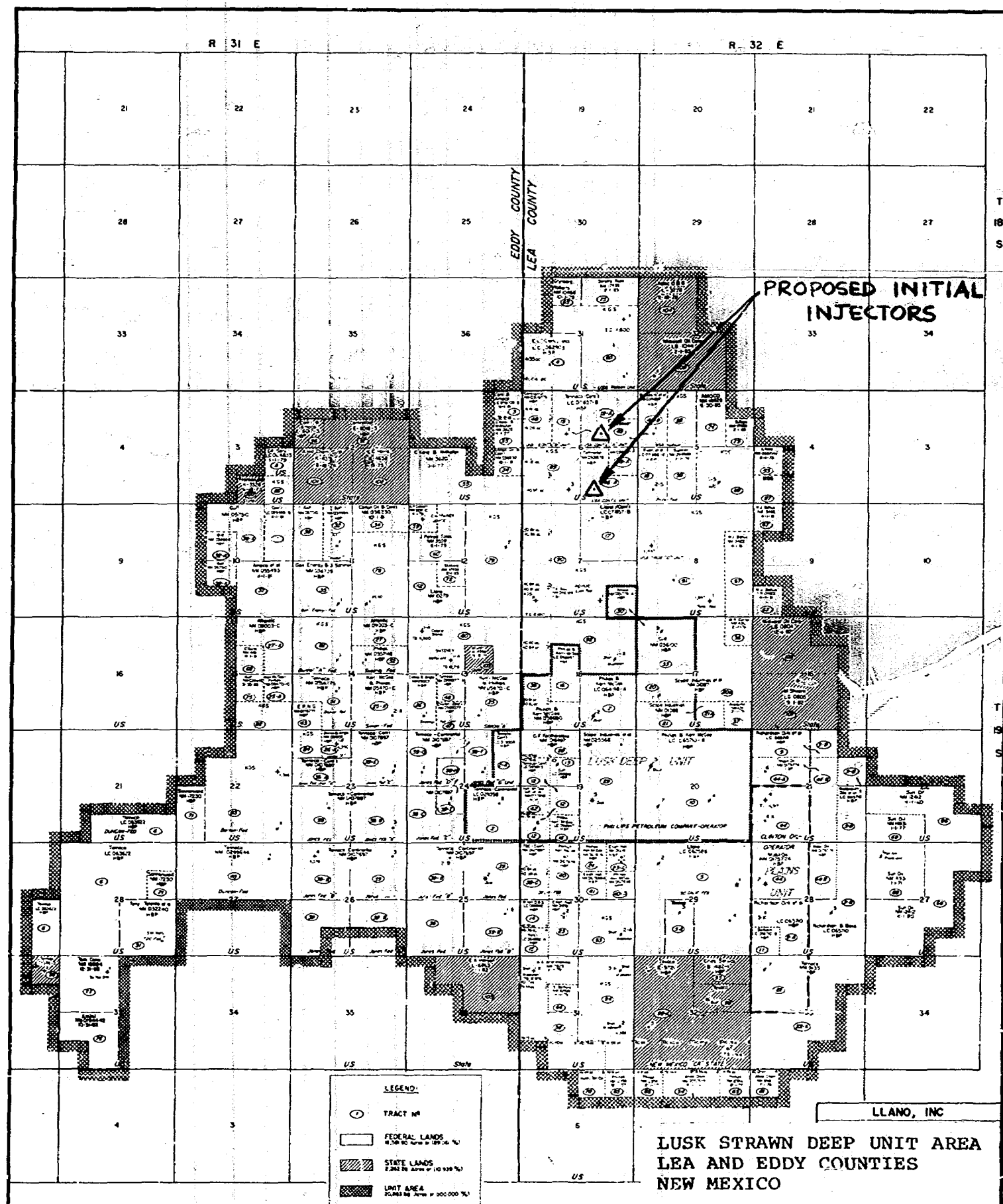


EXHIBIT "A"

Tenneco Oil Company
Continental Fed. Com. No. 1
660' FSL & 1980' FEL, Sec. 6, T-19-S, R-32-E
NMPM, Lea County, New Mexico

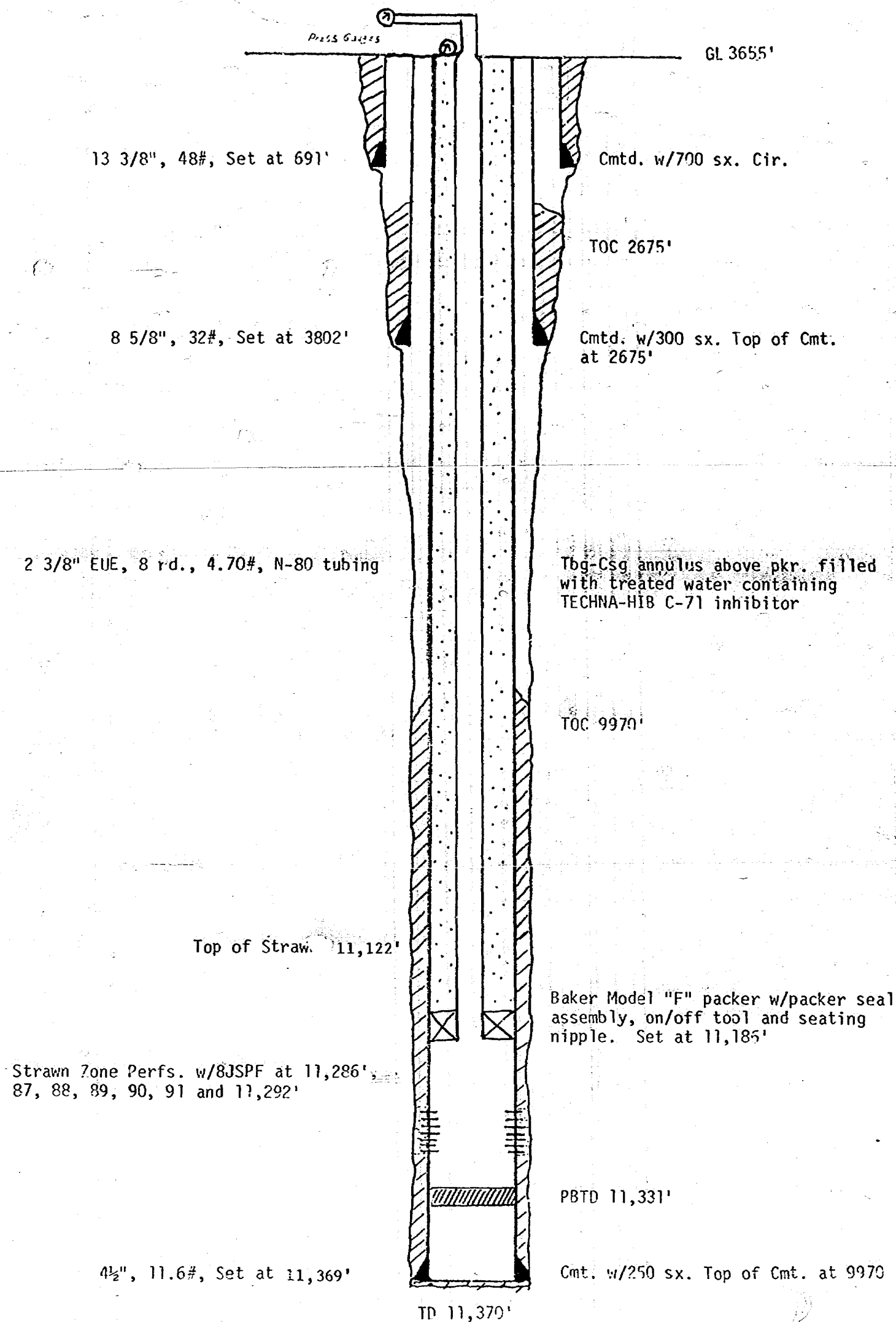


EXHIBIT "B"

LLANO, INC.

Tenneco Oil Company
Continental Federal Unit "A" No. 1
1980' FNL & 1650' FEL, Sec. 6, T-19-S, R-32-E
NMPM, Lea County, New Mexico

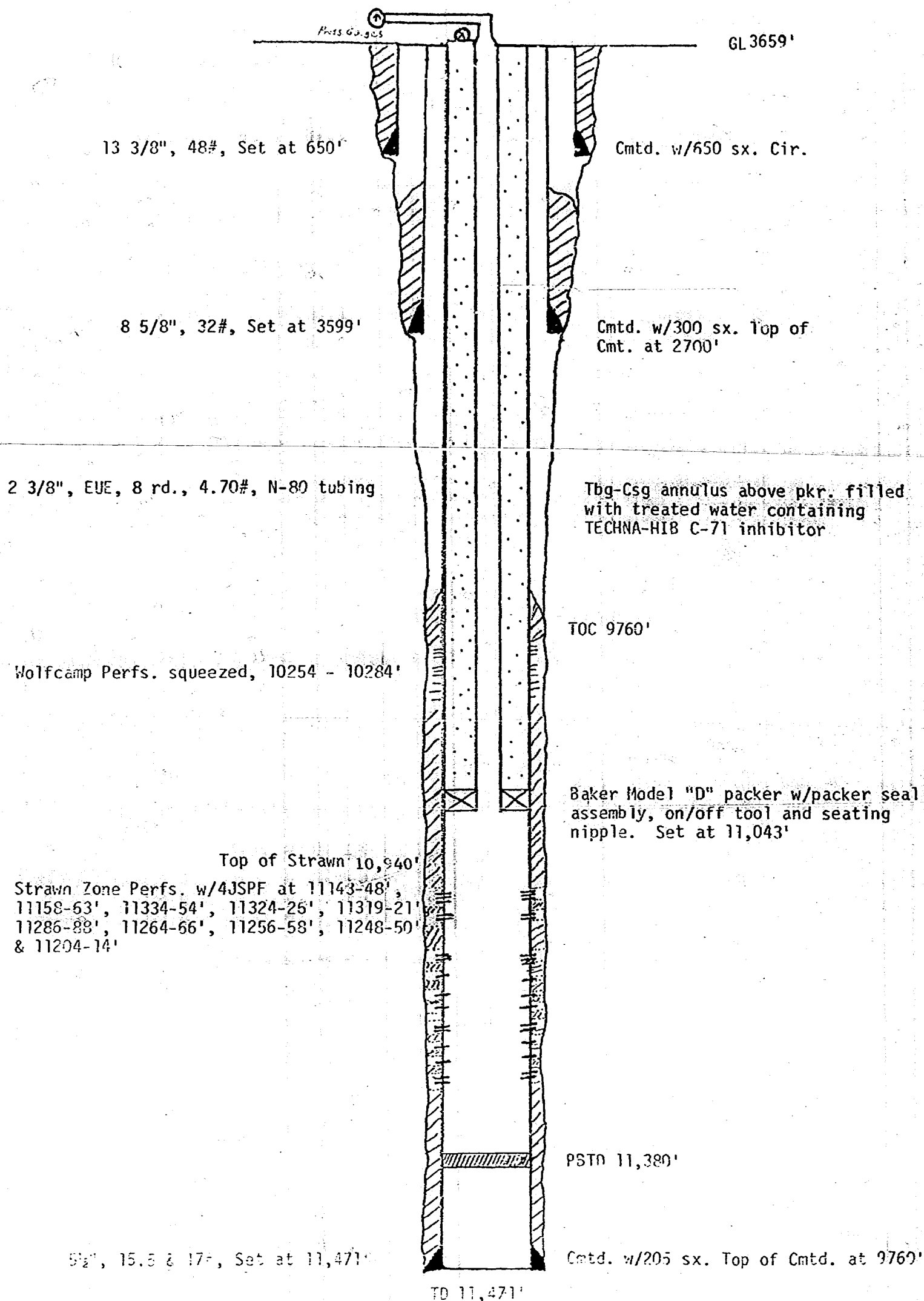


EXHIBIT "C"

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF LLANO, INC. FOR APPROVAL OF A PRESSURE MAINTENANCE PROJECT FOR THE LUSK STRAWN POOL TO BE EMBRACED WITHIN THE LUSK STRAWN DEEP UNIT AREA CONSISTING OF 20,863.88 ACRES OF FEDERAL AND STATE LANDS IN TOWNSHIPS 18, 19 AND 20 SOUTH, RANGES 31 AND 32 EAST, LEA AND EDDY COUNTIES, NEW MEXICO, INCLUDING TWO GAS INJECTION WELLS FOR THE PURPOSE OF INITIATING A PILOT PROJECT. APPLICANT ALSO SEEKS ESTABLISHMENT OF ADMINISTRATIVE PROCEDURE WHEREBY THE PILOT PROJECT MAY BE EXPANDED FROM TIME TO TIME BY THE CONVERSION OF ADDITIONAL PRODUCING WELLS TO INJECTION WELLS OR TO MAKE ANY CHANGES IN THE INJECTION PATTERN WHICH MAY BECOME NECESSARY; ALSO FOR THE APPROVAL OF SPECIAL POOL RULES INCLUDING A PROJECT ALLOWABLE.

RECEIVED
SEP 17 1965
OIL CONSERVATION COMMISSION
Santa Fe

Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

Comes Llano, Inc. acting by and through the undersigned attorneys and hereby makes application for approval of a pressure maintenance project for the Lusk Strawn Pool to be embraced within the Lusk Strawn Deep Unit Area consisting of 20,863.88 acres of federal and state lands in Townships 18, 19 and 20 South, Ranges 31 and 32 East, Lea and Eddy Counties, New Mexico, including two gas injection wells for the purpose of initiating a pilot project. Applicant also seeks establishment of administrative procedure whereby the pilot project may be expanded from time to time by the conversion of additional producing wells to injection wells or to make any changes in the injection pattern which may become necessary; also for the approval of special pool rules including a project allowable, and in support thereof respectfully shows:

1. There is attached hereto as Exhibit "A" a plat showing the outlines of the Lusk Strawn Deep Unit Area which also shows the character of the lands, of which 18,581.60 acre or 89.061% are federal lands and 2,282.28 acres or 10.939% are state lands.

2. As indicated on Exhibit "A" there are two proposed injection wells, both of which are situated within Section 6, Township 19 South,

Range 32 East. These wells are to be used initially for a pilot project for the injection of gas into the unitized formation which is defined as the vertical interval from 11,097 feet to 11,504 feet on the Schlumberger Gamma Ray-Sonic Log run in the El Paso Natural Gas Company Lusk Deep No. 2 well located in the SW $\frac{1}{4}$ SE $\frac{1}{4}$ Section 18, Township 19 South, Range 32 East, N.M.P.M. It is contemplated that between six and ten million cubic feet of gas per day will be injected into these wells initially and that the project area will be expanded from time to time to cover the entire unit area and ultimately there will be injected approximately sixty million cubic feet of gas per day.

3. There are attached hereto as Exhibits "B" and "C" diagrammatic sketches of the two proposed injection wells, one being the Continental Fed. Com. No. 1 located 660 feet from the south line and 1980 feet from the east line of Section 6 and the other the Continental Federal Unit "A" No. 1 well located 1980 feet from the north line and 1650 feet from the east line of said Section 6. Said diagrammatic sketches show all casing strings including diameters and setting depths, quantities used and tops of cement, perforated intervals, tubing strings, setting depths and types and location of packers to be used.

4. The proposed pressure maintenance project is within the boundaries of the proposed Lusk Strawn Deep Unit Area and applicant has filed a separate application for approval of the Lusk Strawn Deep Unit Agreement by the Commission.

5. Applicant also desires that a project allowable be approved in accordance with Rule 701 of the Commission and that special pool rules be adopted, as well as provision for the administrative approval of the conversion of additional wells for gas injection purposes or the drilling of new wells for such purpose.

6. There are also filed herewith copies of the Sonic Log-Gamma Ray of the two wells above referred to which are to be used for gas injection purposes.

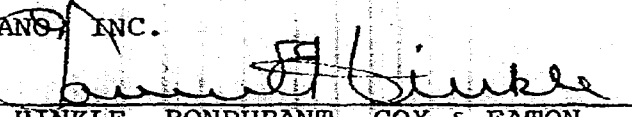
7. In the opinion of applicant the pressure maintenance project will be in the interest of conservation and the prevention of waste as well as the protection of correlative rights and will tend to promote the greatest ultimate recovery of oil and gas from the Lusk Strawn Field or Pool.

8. Applicant requests that this matter be included on the examiner's docket for October 8, 1975.

Respectfully submitted,

ILLANO, INC.

BY


HINKLE, BONDURANT, COX & EATON
P.O. Box 10
Roswell, New Mexico 88201
Attorneys for Applicant

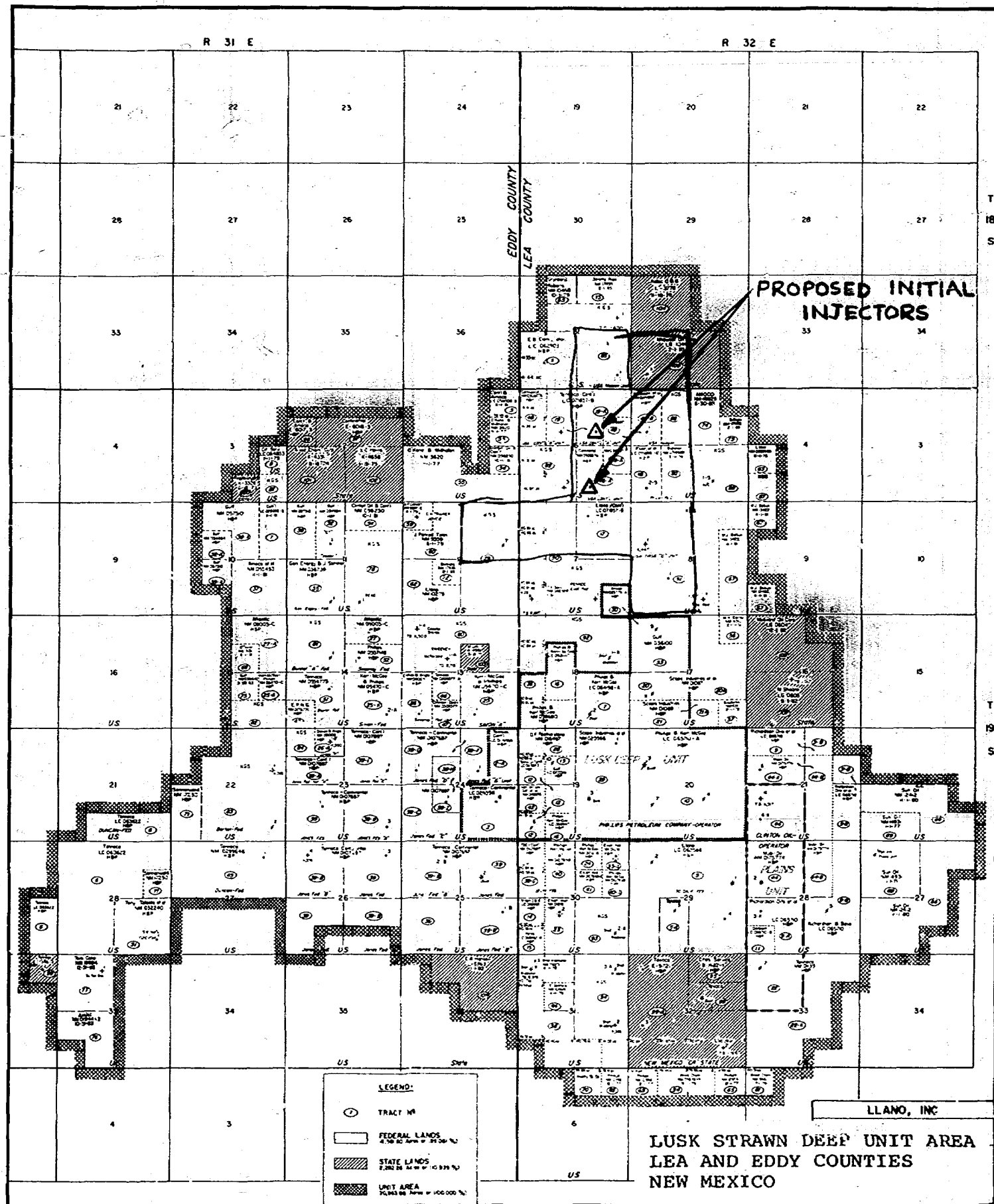


EXHIBIT "A"

LLANO, INC.

Tenneco Oil Company
Continental Fed. Com. No. 1
660' FSL & 1980' FEL, Sec. 6, T-19-S, R-32-E
WPM, Lea County, New Mexico

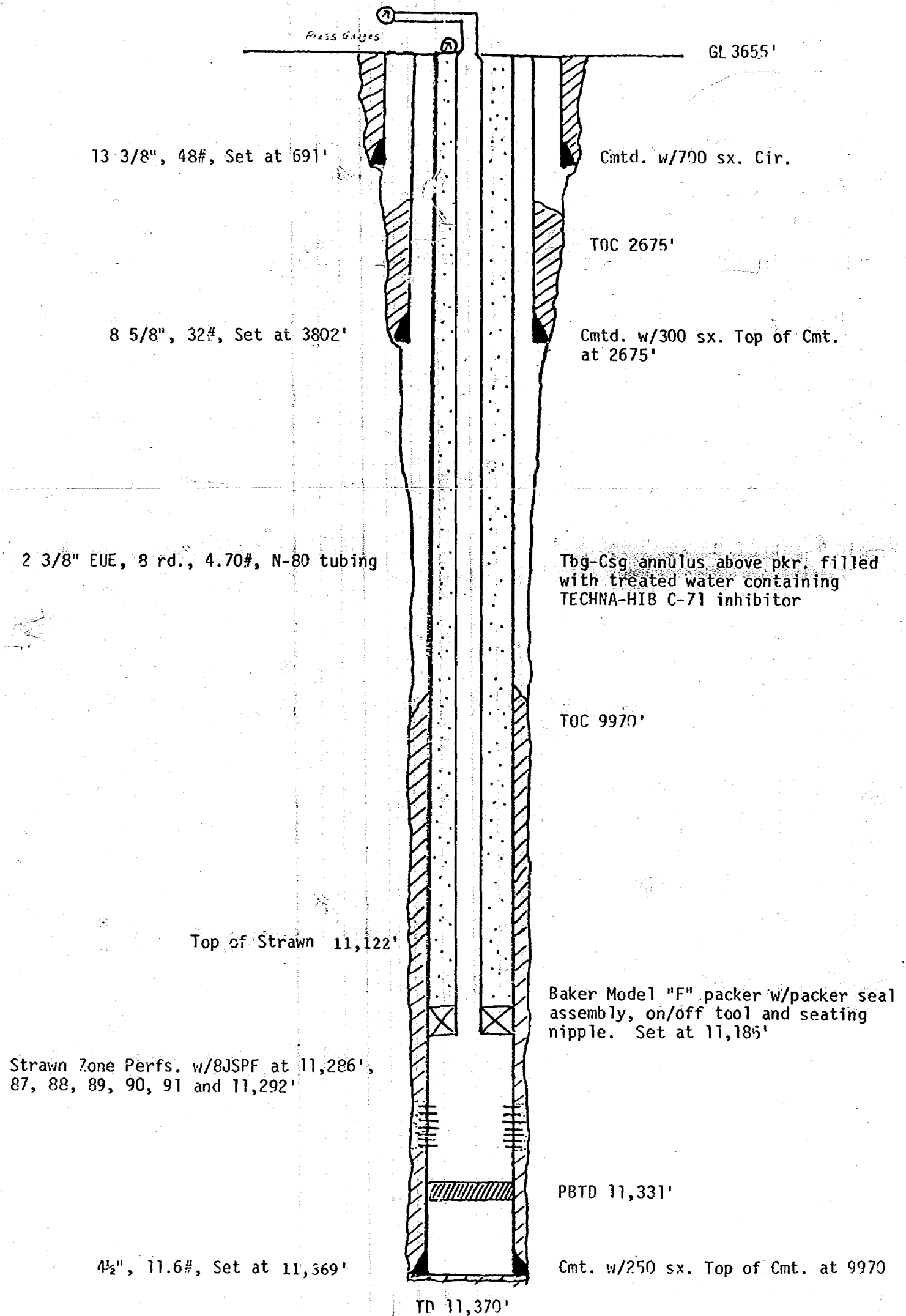


EXHIBIT "B"

LLANO, INC.

Tenneco Oil Company
Continental Federal Unit "A" No. 1
1930' FNL & 1650' FEL, Sec. 6, T-19-S, R-32-E
NMPM, Lea County, New Mexico

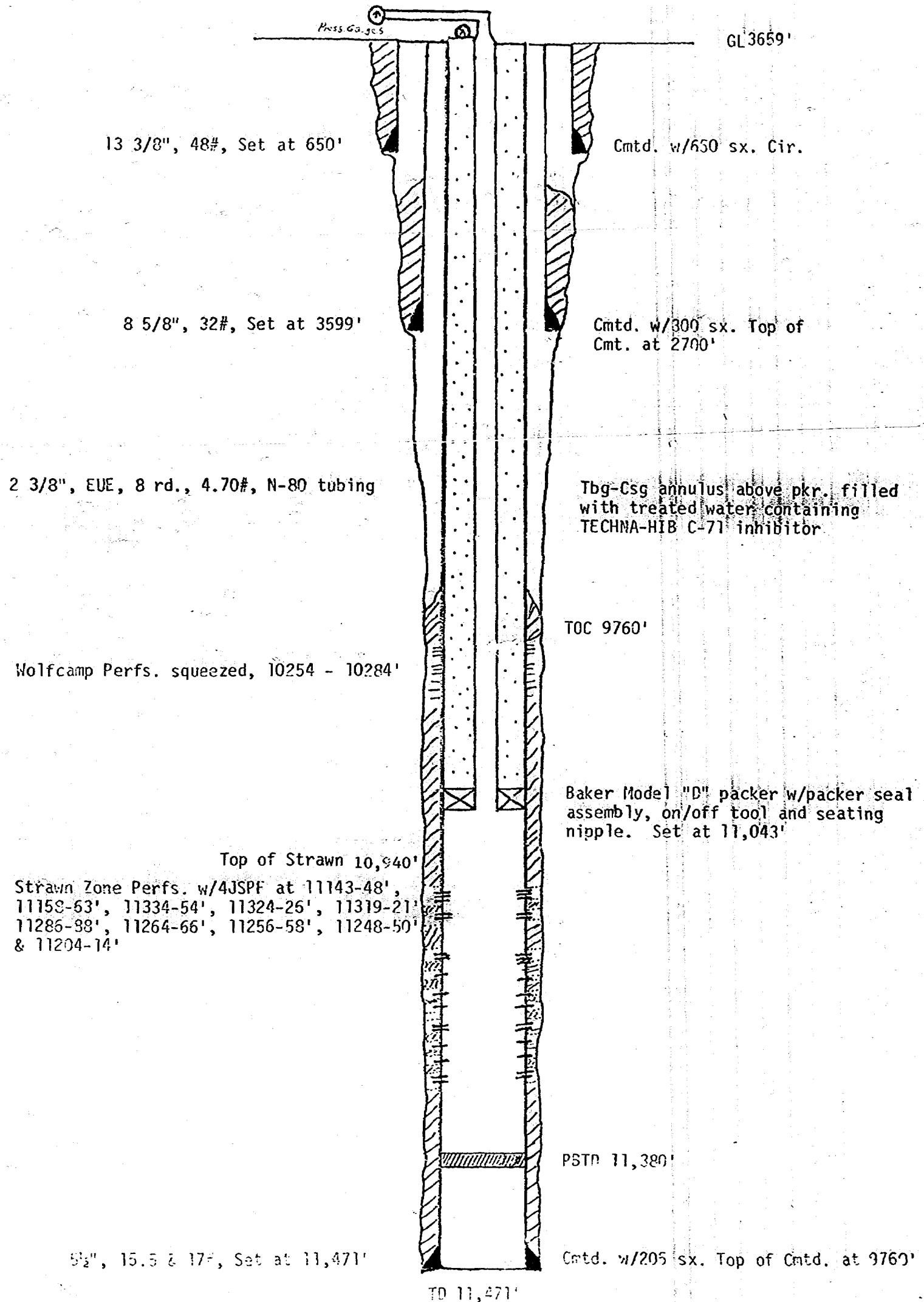
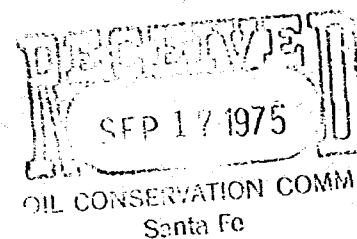


EXHIBIT "C"

BEFORE THE OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

APPLICATION OF LLANO, INC. FOR APPROVAL OF A PRESSURE MAINTENANCE PROJECT FOR THE LUSK STRAWN POOL TO BE EMBRACED WITHIN THE LUSK STRAWN DEEP UNIT AREA CONSISTING OF 20,863.88 ACRES OF FEDERAL AND STATE LANDS IN TOWNSHIPS 18, 19 AND 20 SOUTH, RANGES 31 AND 32 EAST, LEA AND EDDY COUNTIES, NEW MEXICO, INCLUDING TWO GAS INJECTION WELLS FOR THE PURPOSE OF INITIATING A PILOT PROJECT. APPLICANT ALSO SEEKS ESTABLISHMENT OF ADMINISTRATIVE PROCEDURE WHEREBY THE PILOT PROJECT MAY BE EXPANDED FROM TIME TO TIME BY THE CONVERSION OF ADDITIONAL PRODUCING WELLS TO INJECTION WELLS OR TO MAKE ANY CHANGES IN THE INJECTION PATTERN WHICH MAY BECOME NECESSARY; ALSO FOR THE APPROVAL OF SPECIAL POOL RULES INCLUDING A PROJECT ALLOWABLE.



Oil Conservation Commission
Box 2088
Santa Fe, New Mexico 87501

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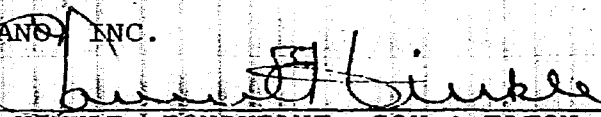
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Respectfully submitted,

LLANO, INC.

By


HINKLE, BONDURANT, COX & EATON
P.O. Box 10
Roswell, New Mexico 88201
Attorneys for Applicant

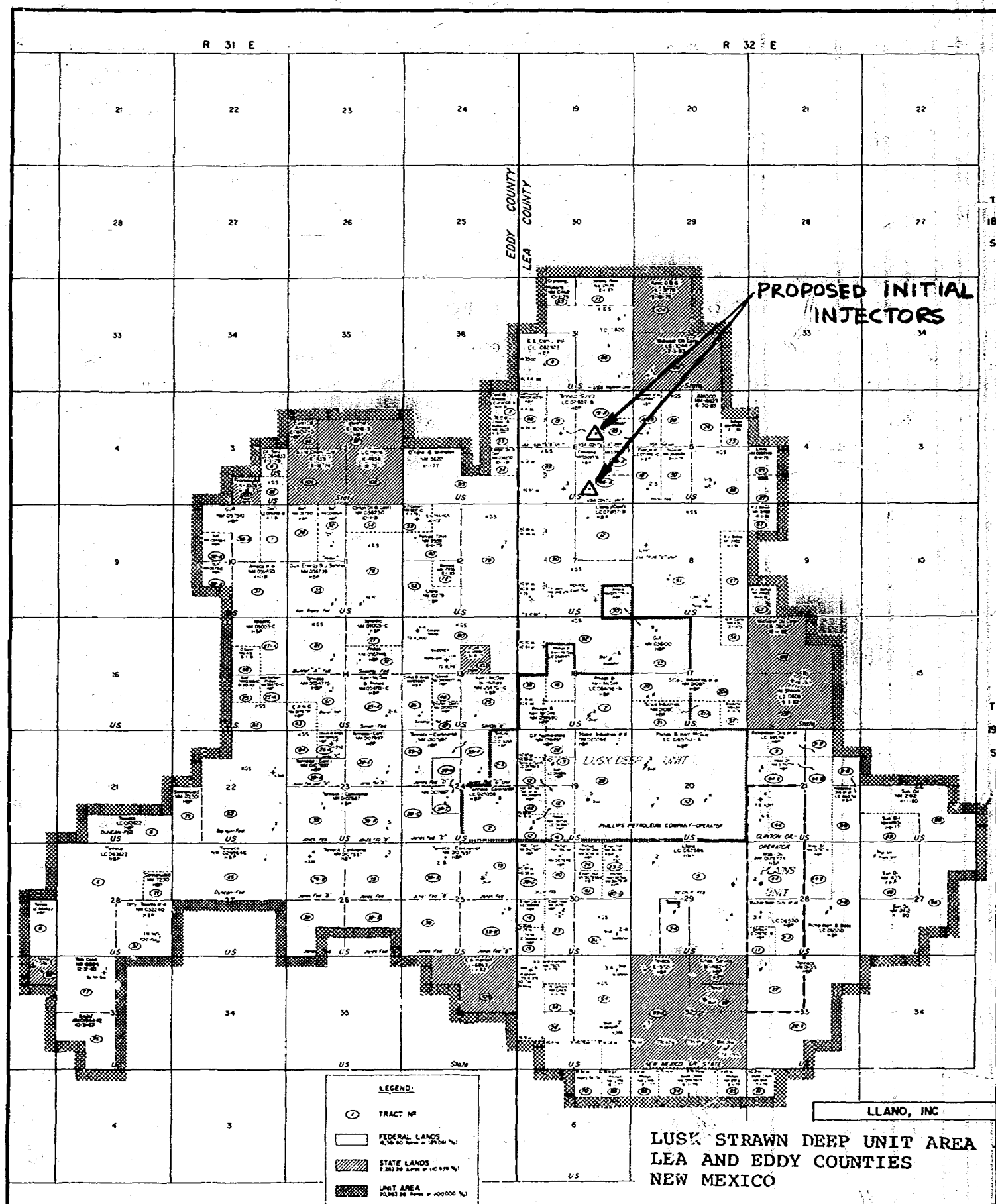


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NMPM, Lea County, New Mexico

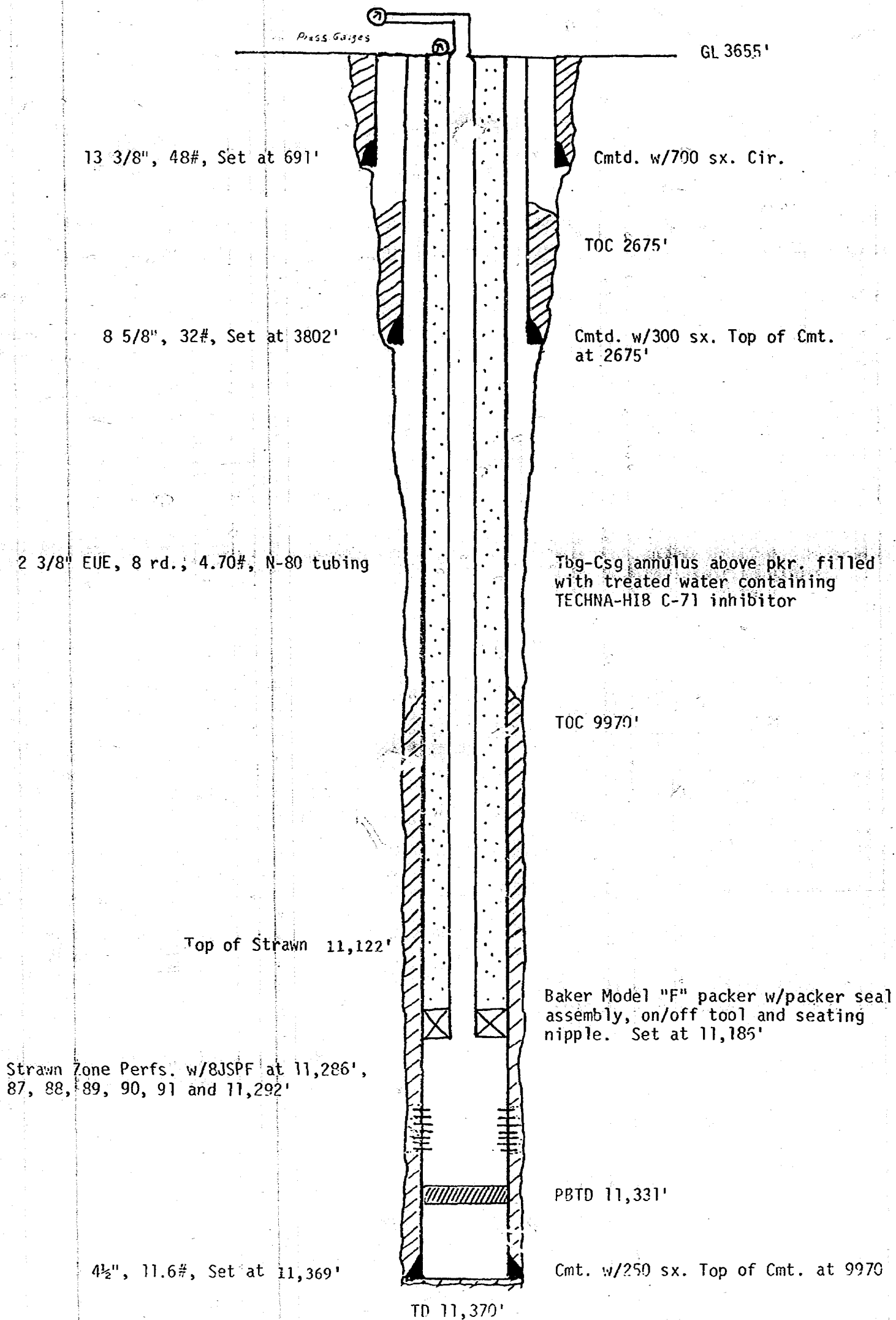


EXHIBIT "B"

LLANO, INC.

Tenneco Oil Company
Continental Federal Unit "A" No. 1
1980' FNL & 1650' FEL, Sec. 6, T-19-S, R-32-F
NMPM, Lea County, New Mexico

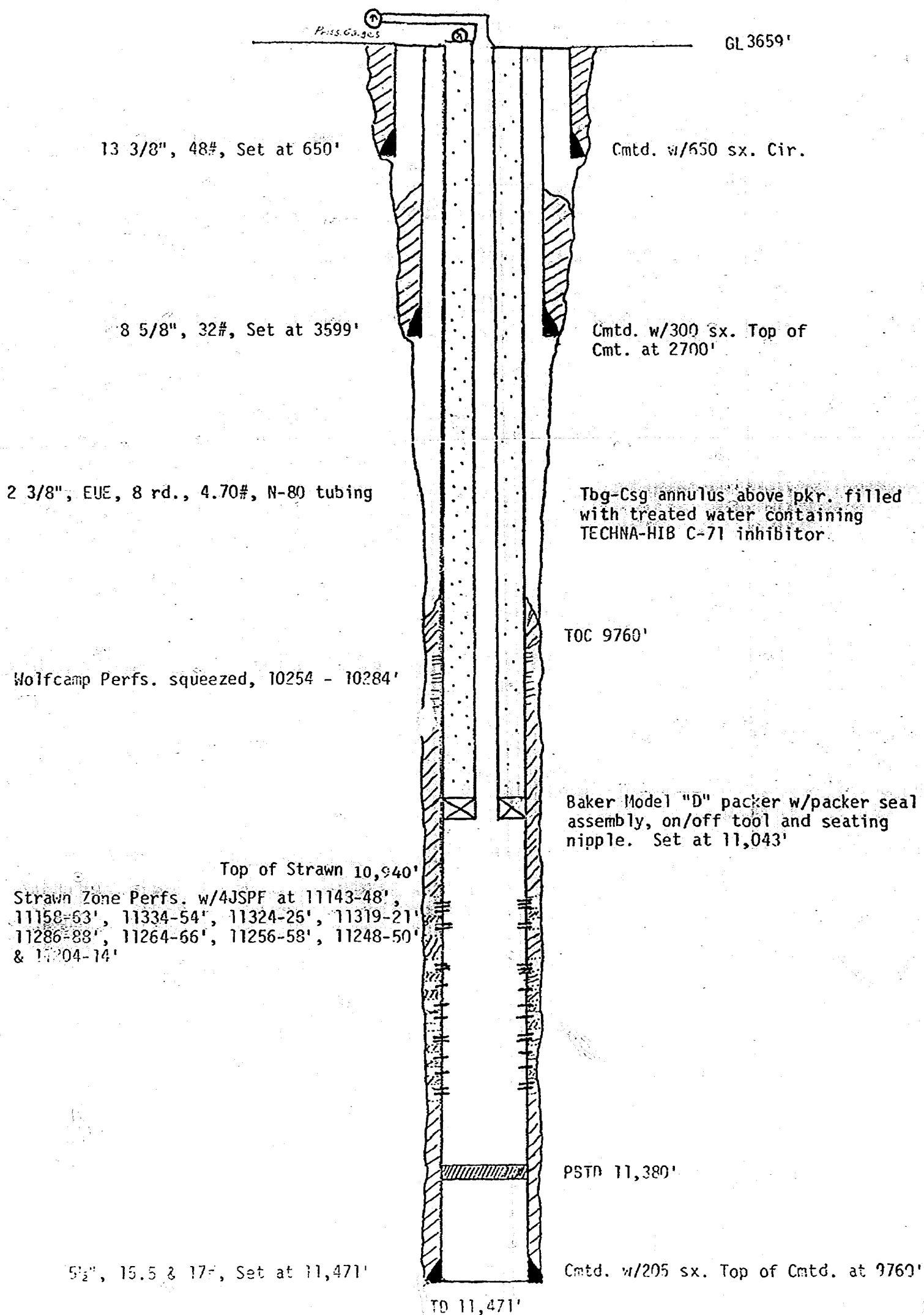


EXHIBIT "C"

DRAFT

BEFORE THE OIL CONSERVATION COMMISSION
OF THE STATE OF NEW MEXICO

dr/

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

CASE NO. 5564

Order No. R- 5123

APPLICATION OF LLANO, INC. FOR A
PRESSURE MAINTENANCE PROJECT, LEA
AND EDDY COUNTIES, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on October 8,
19 75, at Santa Fe, New Mexico, before Examiner Richard L. Stamets.

NOW, on this November day of October, 1975, 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, Llano, Inc., seeks authority to
institute a pilot pressure maintenance project in the Lusk Strawn
Pool, Lea and Eddy Counties, New Mexico, by the injection of ^{extraneous} gas
into the Strawn formation through two wells in its Lusk Strawn
Deep Unit Area, ^{and by} the cycling and reinjection of produced gas
from said unit and pool.

(3) Applicant further seeks rules governing said project,
including but not limited to provision for expansion of the project
area, placing additional wells on injection, changes in injection
pattern for sweep efficiency and determination of project allowable.

(4) That the initial project area should consist of the follow-
ing described acreage in Lea and Eddy Counties, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 31: SE/4

Section 32: SW/4

TOWNSHIP 19 SOUTH, RANGE 31 EAST, NMPM

Section 12: NE/4

TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM

Section 5: W/2

Section 6: E/2

Section 7: N/2

Section 8: W/2

(5) That the project area should be expanded upon completion of additional injection wells or upon a proper showing by the project operator.

(6) That the project allowable should be equal to the top unit allowable for the Lusk-Strawn Pool times the number of proration units within the project area.

(7) That transfer of allowable within the project area should be permitted.

(8) That ^{upon reinjection of available residue gas,} ~~upon reinjection of produced gas,~~ wells within the project area should not be subject to the limiting gas-oil ratio for the Lusk-Strawn Pool.

(9) That initial gas injection is proposed through the former Tenneco Oil Company Continental A Federal Well No. 1 and Continental Federal Com Well No. 1 located in Units G and O, respectively, of Section 6, Township 19 South, Range 32 East, NMPM, Lea County, New Mexico.

(10) That the operator should take all measures necessary including injection through tubing under a packer, logging and monitoring of the casing-tubing annulus, and periodic inspection of injection and producing wells to ensure that all gas ~~injection~~ ^{injected} shall be ~~into~~ and be confined within the Strawn formation.

(11) That approval of the subject application will protect correlative rights and prevent waste.

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

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Case No. 5564
Order No. R-

IT IS THEREFORE ORDERED:

(1) That the applicant, Llano, Inc., is hereby authorized to institute a pressure maintenance project on its Lusk-Strawn Deep ~~Unit~~ ^{Unit} ~~Lease~~, Lusk-Strawn Pool, by the injection of gas into the Strawn formation through the following-described wells in Section 6, Township 19 South, Range 32 East, NMPM, Lea County, New Mexico:

<u>FORMER OPERATOR</u>	<u>LEASE NAME</u>	<u>NO.</u>	<u>UNIT</u>
Tenneco Oil Co.	Continental A Federal	1	G
Tenneco Oil Co.	Continental Federal	Com 1	O

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

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

(4) That the subject pressure maintenance project is hereby designated the Lusk Strawn Deep Unit ^{Pressure Maintenance} ~~Waterflood~~ Project and shall be governed by the provisions of Rules 701, 702, and 703 of the Commission Rules and Regulations.

Case No. 5564
Order No. R-

(5) That Special Rules and Regulations governing the operation of the Lusk Strawn Deep Unit Pressure Maintenance Project are hereby promulgated as follows:

SPECIAL RULES AND REGULATIONS
FOR THE
LUSK STRAWN DEEP UNIT PRESSURE MAINTENANCE PROJECT

Rule 11.3 That the initial project area in the Unit shall comprise the following described area in Lea and Eddy Counties, New Mexico:

TOWNSHIP 18 SOUTH, RANGE 32 EAST, NMPM

Section 31: SE/4

Section 32: SW/4

TOWNSHIP 19 SOUTH, RANGE 31 EAST, NMPM

Section 12: NE/4

TOWNSHIP 19 SOUTH, RANGE 32 EAST, NMPM

Section 5: W/2

Section 6: E/2

Section 7: N/2

Section 8: W/2

Rule 12.1 That the project area shall (automatically) be expanded to include all proration units in the Lusk Strawn Deep Unit ~~to~~ ^{shall be} ~~include all such units~~ on which ~~is~~ ^{are} located gas injection wells ~~are~~ and ^{9/11} ~~the~~ direct and diagonal offsetting proration units. ~~located~~

located

Rule 13.2 That the project area may be otherwise expanded administratively by the Secretary-Director of the Commission upon a proper showing by the operator.

Rule 14.3 The allowable for the project area shall be any amount up to and including a volume equal to the top unit allowable for the Lusk-Strawn Pool times the number of proration units in the project area.

Rule 15.3 The allowable to the project area may be produced from any well or wells within the project area in any proportion, provided that no producing well in the project area which directly or diagonally offsets a well not committed to the Unit and producing from the same common source of supply shall produce in excess of the top allowable for the Lusk-Strawn Pool.

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Case No. 5564
Order No. R-

For the purpose of these rules, "Available Residue Gas" shall be defined as being all gas produced from the unit and formation less plant shrinkage, plant fuel, and lease fuel required for operation of the lease.

That all available residue

RULE (6) That provided ~~no~~ produced gas is reinjected, wells in the project area shall not be subject to the limiting gas-oil ratio for the Lusk-Strawn Pool. ←

RULE 7. The Secretary-Director of the Commission is hereby authorized to approve such additional producing wells and injection wells at orthodox and unorthodox locations within the boundaries of the Lusk Strawn Deep Unit Area as may be necessary to complete an efficient production and injection pattern, provided said producing wells are drilled no closer than 660 feet to the outer boundary of said unit nor closer than 10 feet to any quarter-quarter section or subdivision inner boundary, ~~and provided that no well shall be approved for gas injection when such well is located closer than 1650 feet to a tract which is not committed to the unit and on which is located a well producing from the same common source of supply.~~ To obtain such approval, the project operator shall file proper application with the Commission, which application, if it seeks authorization to convert additional wells to injection or to drill additional production or injection wells shall include the following:

(a) A plat identifying the lands committed to the unit agreement and those lands not committed to said agreement, and showing the location of the proposed well, all wells within the unit area, and offset operators.

(b) A schematic drawing of ~~the~~ ^{any} proposed ^{injection} well which fully describes the casing, tubing, ^{perforated interval,} and depth.

(c) A letter stating that all offset operators to the proposed well have been furnished a complete copy of the application and the date of notification.

The Secretary-Director may approve the proposed 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.

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Case No. 5564

Order No. R-

(6) That monthly progress reports of the project herein authorized shall be submitted to the Commission in accordance with Rule 704 of the Commission Rules and Regulations on forms approved by the Commission.

(7) 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.