CASE 3781: Appli. of SINCLAIR OIL & GAS COMPANY FOR SALT WATER DISPOSAL, LEA COUNTY, NEW MEXICO.

Case Number

3781

Application

Transcripts.

Small Exhibits

ETC.

GOVERNOR
DAVID F. CARGO
CHAIRMAN

State of New Mexico
Oil Conservation Commission

LAND COMMISSIONER
GUYTON B. HAYS
MEMBER

P. O. BOX 2088
SANTA FE

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

June 18, 1968

Re: Case No. 3781
Order No. R-3433
Applicant:
Sinclair Oil & Gas Company

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

Dear Sir:

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

Very truly yours,

A. L. Porter, Jr.

A. L. PORTER, Jr.
Secretary-Director

ALP/ir

Carbon copy of drder also sent to:

Hobbs OCC x
Artesia OCC
Aztec OCC
Other State Engineer Office

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. 3781
Order No. R-3433

APPLICATION OF SINCLAIR OIL & GAS
COMPANY FOR SALT WATER DISPOSAL,
LEA COUNTY, NEW MEXICO.

ORDER OF THE COMMISSION

BY THE COMMISSION:

This cause came on for hearing at 9 a.m. on June 5, 1968, at Santa Fe, New Mexico, before Examiner Daniel S. Nutter.

NOW, on this 18th day of June, 1968, 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, Sinclair Oil & Gas Company, is the owner and operator of the State "AW" Well No. 4, located in Unit I of Section 35, Township 15 South, Range 36 East, NMPM, Dean Field, Lea County, New Mexico.

(3) That the applicant proposes to utilize said well to dispose of produced salt water into the Wolfcamp formation, with injection into the perforated interval from approximately 10,434 feet to 10,488 feet.

(4) That the subject well is located down-dip from other offsetting wells producing from the proposed disposal interval, and disposal thereinto should not have an adverse effect on said wells.

(5) That the injection should be accomplished through 2 3/8-inch internally plastic-coated tubing installed in a

packer set at approximately 10,400 feet; that the casing-tubing annulus should be filled with an inert fluid; and that a pressure gauge should be attached to the annulus or the annulus left open at the surface in order to determine leakage in the tubing or packer.

(6) That approval of the subject application will prevent the drilling of unnecessary wells and otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED:

(1) That the applicant, Sinclair Oil & Gas Company, is hereby authorized to utilize its State "AW" Well No. 4, located in Unit I of Section 35, Township 15 South, Range 36 East, NMPM, Dean Field, Lea County, New Mexico, to dispose of produced salt water into the Wolfcamp formation, injection to be accomplished through 2 3/8-inch tubing installed in a packer set at approximately 10,400 feet, with injection into the perforated interval from approximately 10,434 feet to 10,488 feet;

PROVIDED HOWEVER, that the tubing shall be internally plastic-coated; that the casing-tubing annulus shall be filled with an inert fluid; and that a pressure gauge shall be attached to the annulus or the annulus left open at the surface in order to determine leakage in the tubing or packer.

(2) That the applicant shall submit monthly reports of its disposal operations in accordance with Rules 704 and 1120 of the Commission Rules and Regulations.

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

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

STATE OF NEW MEXICO
OIL CONSERVATION COMMISSION

DAVID F. CARGO, Chairman

GUYTON B. HAYS, Member

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

esr/

Mobil Oil Corporation

P.O. BOX 633
MIDLAND, TEXAS 79701

May 16, 1968

Case 3871

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

Attention Mr. D. S. Nutter

SINCLAIR OIL COMPANY'S APPLICATION
TO INJECT PRODUCED WATER INTO
ZONES PRODUCTIVE OF OIL AND GAS
CITIES SERVICE STATE "AW" WELL NO. 4
DEAN PERMO-PENNSYLVANIAN FIELD
LEA COUNTY, NEW MEXICO

Gentlemen:

Mobil Oil Corporation has been advised of Sinclair's subject application. Sinclair has further advised Mobil that proposed salt water disposal perforations 10,685'-10,694' will be sealed prior to injection of water into Well No. 4.

Please be advised that if water is not injected into the interval of 10,685'-10,694' in State "AW" Well No. 4, then Mobil has no objection to this application.

Yours very truly,

Ira B. Stitt
Division Operations Engineer

FLHart/vp

MAIN OFFICE
'68 MAY 20 AM 8

Docket No. 17-68

DOCKET: EXAMINER HEARING - WEDNESDAY - JUNE 5, 1968

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

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

CASE 3777: Application of Atlantic Richfield Company for salt water disposal, Roosevelt County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the Bough "C" zone of the Pennsylvanian formation in its State AE Well No. 2 located in Unit L of Section 36, Township 8 South, Range 36 East, Allison-Pennsylvanian Pool, Roosevelt County, New Mexico, in the perforated interval from 9662 feet to 9672 feet.

CASE 3778: Application of Atlantic Richfield Company for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its State BH Well No. 1 located 660 feet from the North and West lines of Section 13, Township 19 South, Range 34 East, Quail-Queen Pool, Lea County, New Mexico, in such a manner as to permit production of oil from 5080 feet to 5136 feet in the lower Queen formation through tubing and the disposal of produced salt water into the upper Queen formation through the casing-tubing annulus in the perforated interval from 4820 feet to 4830 feet.

CASE 3779: Application of Shenandoah Oil Corporation for a waterflood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a waterflood project by the injection of water into the Yates, Seven Rivers, Queen, and Grayburg formations through five wells located in units F and N of Section 29, and units A, G, and I of Section 30, all in Township 18 South, Range 31 East, Shugart Pool, Eddy County, New Mexico.

CASE 3780: Application of Amerada Petroleum Corporation for an amendment to Order No. R-3407, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the amendment of Order No. R-3407, which authorized the drilling of a water injection well in its Langlie-Mattix Woolworth unit waterflood project at an unorthodox location 75 feet from the North line and 2635 feet from the West line of Section 27, Township 24 South, Range 37 East, Lea County, New Mexico. Applicant now proposes to locate said well 75 feet from the North line and 2540 feet from the West line of said Section 27.

CASE 3781: Application of Sinclair Oil & Gas Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water by injection into the Permo-Pennsylvanian formation in the interval 10,434 feet to 11,537 feet in the Cities Service State "AW" Well No. 4 located in Unit I of Section 35, Township 15 South, Range 36 East, Dean Field, Lea County, New Mexico.

CASE 3782: Application of Pan American Petroleum Corporation for a waterflood project, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a water-flood project by the injection of water into the Seven Rivers and Queen formations underlying its Cortland Myers unit area through three wells located in units F, J, and P of Section 22, Township 24 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 3783: Application of Pan American Petroleum Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Cortland Myers Unit Area comprising 240 acres, more or less, of Federal lands in Section 22, Township 24 South, Range 37 East, Langlie-Mattix Pool, Lea County, New Mexico.

CASE 3784: Application of Pan American Petroleum Corporation for a unit agreement, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks approval of the North King Camp Unit Area comprising 14,697 acres, more or less, of State, Federal, and fee lands in Township 13 South, Ranges 29 and 30 East, Chaves County, New Mexico.

CASE 3785: Application of Pan American Petroleum Corporation for an unorthodox gas well location, Chaves County, New Mexico. Applicant, in the above-styled cause, seeks authority to drill its Poitevent Gas "Com" Well No. 1 at an unorthodox gas well location 990 feet from the North line and 1650 feet from the East line of Section 11, Township 15 South, Range 27 East, Buffalo Valley-Pennsylvanian Gas Pool, Chaves County, New Mexico, in exception to the pool rules which require wells in said pool to be located in the NW/4 or SE/4 of the section.

CASE 3786: Application of Texaco Inc. for special pool rules, Lea County, New Mexico. Applicant, in the above-styled cause, seeks the promulgation of special pool rules for the North Paduca-Delaware Pool, Lea County, New Mexico, including a provision for classification of oil and gas wells in said pool, a limiting gas-oil ratio of 3000 to one, and 40-acre spacing for oil wells and 160-acre spacing for gas wells. Locations would be no nearer than 330 feet to a quarter-quarter section line.

CASE 3776: (Continued from the May 22, 1968 Examiner Hearing)

Application of J. M. Huber Corporation for a unit agreement, Lea County, New Mexico. Applicant, in the above-styled cause, seeks approval of the Union-State Unit Area comprising 1360 acres, more or less, of State lands in Township 15 South, Range 32 East, Lea County, New Mexico.

ir/

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SINCLAIR OIL & GAS COMPANY
P. O. BOX 1470
MIDLAND, TEXAS 79701

May 14, 1968

Case 3781

WEST TEXAS REGION

New Mexico Oil Conservation Commission (3)
P. O. Box 2088
Santa Fe, New Mexico

Attention: Mr. D. S. Nutter, Chief Engineer

Gentlemen:

Sinclair Oil & Gas Company, as Operator of the Dean Pool Salt Water Disposal System, Lea County, New Mexico, hereby makes application for approval to inject produced Devonian and Permo-Pennsylvanian water into the Permo-Pennsylvanian zone through Cities Service Oil Company's State "AW" Well No. 4. In support of this request please find attached an area map showing all wells within a radius of 2 miles of the proposed injection well, a plat showing the current Devonian and current Permo-Pennsylvanian producing wells as well as the plugged or shut-in producing wells in the Dean Pool area, Form C-108 listing pertinent data on the proposed injection well, a diagramatic sketch and an electric log on the proposed injection well.

All Operators within 1/2 mile of this injection well as well as the surface Lessee have been furnished copies of this letter and application this date. It is requested that this matter be set for hearing at the earliest possible date. The law firm of White, Gilbert, Koch and Kelly will represent Sinclair in this matter.

Yours very truly,

R. M. Anderson

R. M. Anderson
Region Regulatory Engineer

RMA/ar

cc: Mr. C. E. Alexander, Tatum Highway, Lovington, New Mexico
Mobil Oil Corporation, P. O. Box 633, Midland, Texas 79701
Humble Oil & Refining Company, P. O. Box 1600, Midland, Texas 79701
Atlantic-Richfield Company, P. O. Box 1978, Roswell, New Mexico 88201
White, Gilbert, Koch and Kelly. P. O. Box 787, Santa Fe, New Mexico.

DOCKET MAILED

Date 5-23-68

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Form C-108
Revised 1-1-65

Case 3781

NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION

OPERATOR: SINCLAIR OIL & GAS COMPANY for the Dean Pool Salt Water Disposal System.		ADDRESS: P. O. Box 1920, Hobbs, New Mexico 88240	
LEASE NAME: State "AW"	WELL NO.: 4	FIELD: Dean Permo-Pennsylvanian	COUNTY: Lea

LOCATION: UNIT LETTER I ; WELL IS LOCATED 1980 FEET FROM THE South LINE AND 660 FEET FROM THE East LINE, SECTION 35 TOWNSHIP 15S RANGE 36E NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
SURFACE CASING	13 3/8"	367	350	Unknown	-
INTERMEDIATE	8 5/8"	4924	1983	Circulated to surface	
LONG STRING	5 1/2"	11,595	350	10,310	Survey

TUBING: 3100' of 2 7/8" and 7400' of 2 3/8" 10,500' — NAME, MODEL AND DEPTH OF TUBING PACKER: Model "D" @ 10,400'.

NAME OF PROPOSED INJECTION FORMATION	TOP OF FORMATION	BOTTOM OF FORMATION
Permo-Pennsylvanian	10,434	11,537

IS INJECTION THROUGH TUBING, CASING, OR ANNULUS?	PERFORATIONS OR OPEN HOLE?	PROPOSED INTERVAL(S) OF INJECTION
Tubing	Perforations	10,434-44, 10,468-88, ~~10,685-91, 11,510-37~~

IS THIS A NEW WELL DRILLED FOR DISPOSAL?	IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED?	HAS WELL EVER BEEN PERFORATED IN ANY ZONE OTHER THAN THE PROPOSED INJECTION ZONE?
No	Well is a depelted oil well.	No

LIST ALL SUCH PERFORATED INTERVALS AND SACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH: None

Squeezed at Hobbs

DEPTH OF BOTTOM OF DEEPEST FRESH WATER ZONE IN THIS AREA	DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA	DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA
Approximately 300 ft.	None	Devonian @ 13,700'

ANTICIPATED DAILY INJECTION VOLUME (BBLS.) MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM	IS INJECTION TO BE BY GRAVITY OR PRESSURE?	APPROX. PRESSURE (PSI)
900	1200	Closed	Pressure	1950

ANSWER YES OR NO WHETHER THE FOLLOWING WATERS ARE MINERALIZED TO SUCH A DEGREE AS TO BE UNFIT FOR DOMESTIC, STOCK, IRRIGATION, OR OTHER GENERAL USE —	WATER TO BE DISPOSED OF	NATURAL WATER IN DISPOSAL ZONE	ARE WATER ANALYSES ATTACHED?
	Yes	Yes	No

NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND): Mr. C. E. Alexander, Tatum Highway, Lovington, New Mexico

LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (½) MILE OF THIS INJECTION WELL:

Mobil Oil Corporation, P. O. Box 633, Midland, Texas 79701

Humble Oil & Refining Company, P. O. Box 1600, Midland, Texas 79701

Atlantic-Richfield Company, P. O. Box 1978, Roswell, New Mexico 88201

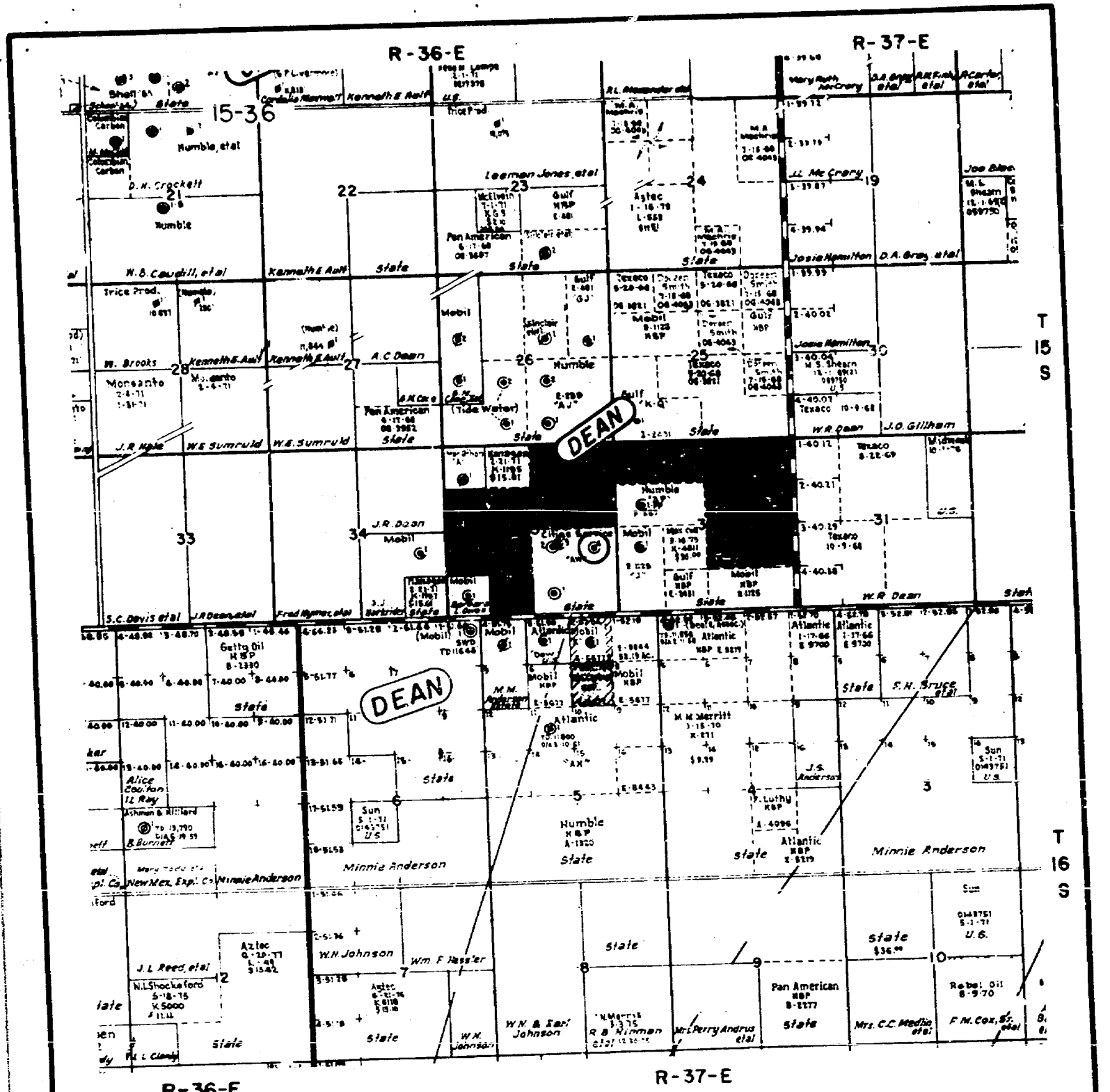
HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?	SURFACE OWNER	EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL	THE NEW MEXICO STATE ENGINEER
	Yes	Yes	No
ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)	PLAT OF AREA	ELECTRICAL LOG	DIAGRAMMATIC SKETCH OF WELL
	Yes	Yes	Yes

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

L. M. Anderson — Region Regulatory Engineer — 5-14-68

(Signature) (Title) (Date)

NOTE: Should waivers from the State Engineer, the surface owner, and all operators within one-half mile of the proposed injection well. not accompany this application, the New Mexico Oil Conservation Commission will hold the application for a period of 15 days from the date of receipt by the Commission's Santa Fe office. If at the end of the 15-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing, if the applicant so requests. SEE RULE 701.



SINCLAIR OIL & GAS CO.

MIDLAND, TEXAS

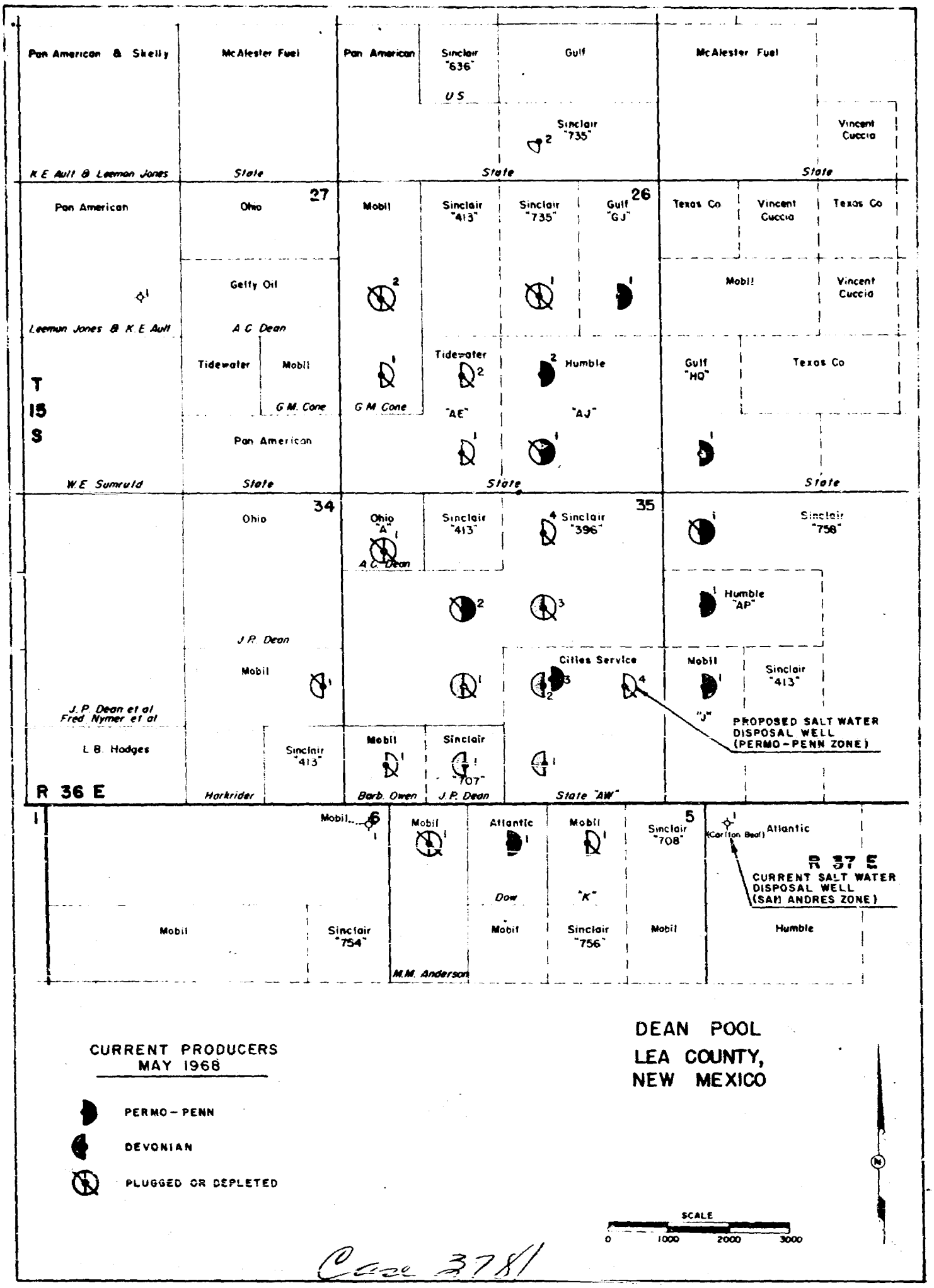
PART OF

LEA COUNTY, NEW MEXICO

DRAWN BY _____ CHECKED BY _____ DATE _____

SCALE- 1" = 4000' REVISED _____

Case 3781

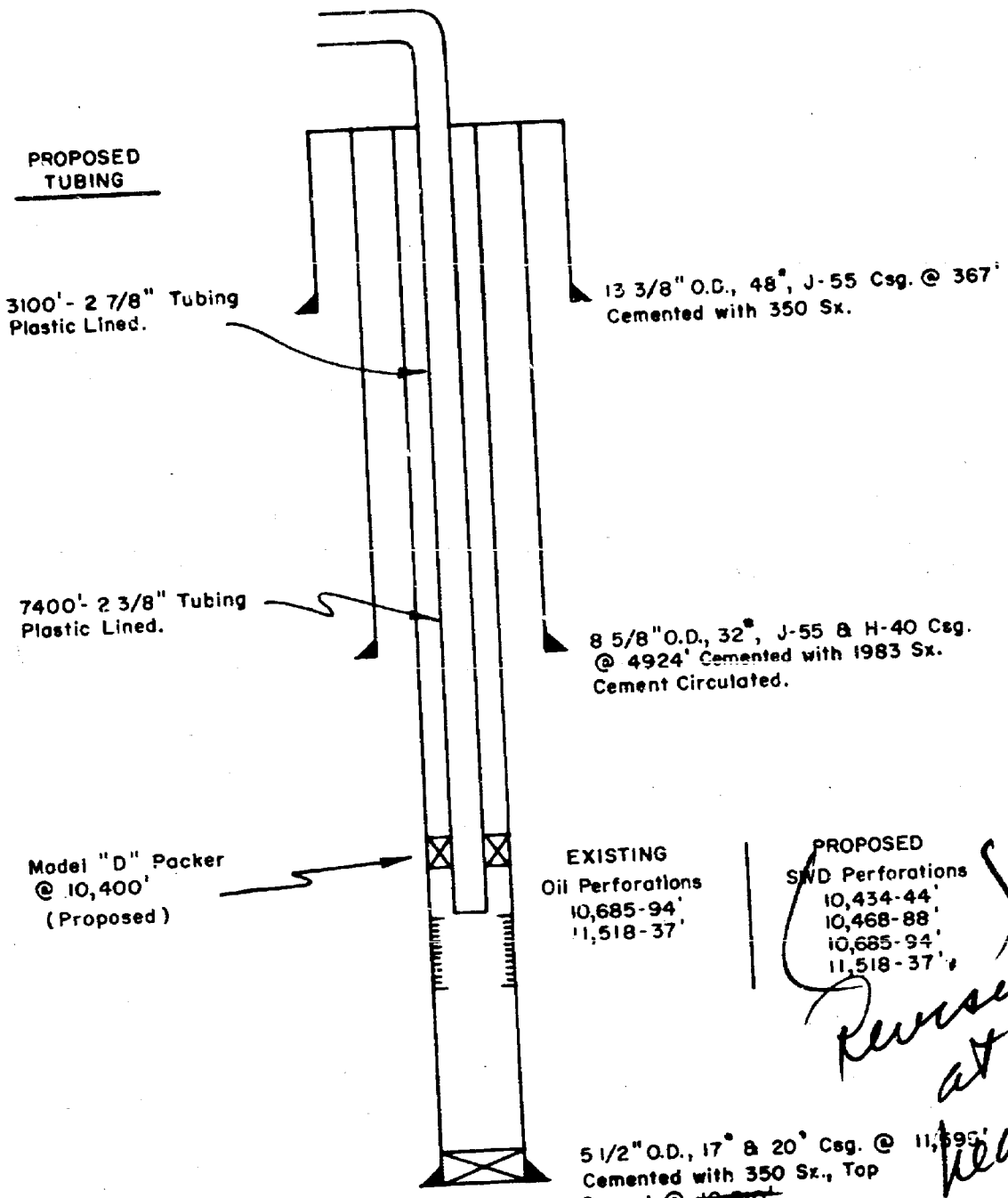

Pan American & Skelly
McAlester Fuel
Pan American
Sinclair "636"
US
Gulf
Sinclair "735"
McAlester Fuel
Vincent Cuccia
K E Ault & Leeman Jones
State
State
State
Pan American
Ohio
27
Mobil
Sinclair "413"
Sinclair "735"
Gulf "GJ"
26
Texas Co
Vincent Cuccia
Texas Co
Getty Oil
A C Dean
Mobil
Vincent Cuccia
Leeman Jones & K E Ault
Tidewater
Mobil
G M Cone
G M Cone
Tidewater
"AE"
Humble
"AJ"
Gulf "HQ"
Texas Co
T 15 S
Pan American
W E Sumrall
State
State
State
State
Ohio
34
Ohio "A"
A C Dean
Sinclair "413"
Sinclair "396"
35
Sinclair "758"
Humble "AP"
J P Dean
Mobil
Cities Service
Mobil
Sinclair "413"
"J"
PROPOSED SALT WATER DISPOSAL WELL (PERMO-PENN ZONE)
J.P. Dean et al
Fred Nymer et al
L B. Hodges
Harkrider
Sinclair "413"
Mobil
Barb. Owen
Sinclair
"707"
J.P. Dean
State "AW"
R 36 E
Mobil
6
Mobil
Atlantic
Mobil
Sinclair "708"
5
Atlantic
(Carlton Beal)
R 37 E
CURRENT SALT WATER DISPOSAL WELL (SAN ANDRES ZONE)
Dow
"K"
Mobil
Sinclair "754"
Mobil
Sinclair "756"
Mobil
Humble
M.M. Anderson
CURRENT PRODUCERS
MAY 1968
PERMO-PENN
DEVONIAN
PLUGGED OR DEPLETED
DEAN POOL
LEA COUNTY,
NEW MEXICO
SCALE
0
1000
2000
3000
N

Case 3781

DEAN POOL SALT WATER DISPOSAL SYSTEM
SINCLAIR OIL & GAS CO.- OPERATOR

PROPOSED SALT WATER DISPOSAL WELL

(CITIES SERVICE STATE "AW" WELL NO. 4)



Revised at hearing

Case 3781

BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
June 5, 1968

EXAMINER HEARING

IN THE MATTER OF:

Application of Sinclair Oil & Gas Company for salt water disposal, Lea County, New Mexico.

Case No. 3781

BEFORE: Daniel S. Nutter, Examiner

TRANSCRIPT OF HEARING

MR. NUTTER: The hearing will come to order, please. The next case will be Case 3781.

MR. HATCH: Application of Sinclair Oil & Gas Company for salt water disposal, Lea County, New Mexico.

MR. KELLY: Booker Kelly of White, Gilbert, Koch and Kelly, Santa Fe, on behalf of the applicant. I have one witness and ask that he be sworn.

(Witness sworn.)

(Whereupon, Exhibits 1 through 5 were marked for identification.)

R. M. ANDERSON

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

DIRECT EXAMINATION

BY MR. KELLY:

Q Would you state your name, position and employer?

A R. M. Anderson. I am Region Regulatory Engineer with Sinclair Oil and Gas Company in their Midland, Texas Office.

Q Have you previously qualified as an expert witness before this Commission?

A I have.

Q Would you briefly state what Sinclair seeks by this

application?

A This is the application of Sinclair Oil and Gas Company as operator of the Dean Pool Salt Water Disposal System for approval to use the Cities Service Oil Company State "AW" Well No. 4, a depleted Permo-Penn producing well in the Dean Field, as a salt water disposal well for the system.

Q Referring to Exhibit 1, which is a plat of the area, would you explain that and locate the proposed disposal well?

A Exhibit 1 is an area map of a portion of Lea County, New Mexico, centered on the Dean Field and the Cities Service Well No. 4; the proposed salt water disposal well is circled in red on Exhibit 1.

Q Does the Exhibit 1 show all of the wells within a two-mile radius?

A Yes, sir. And all of the wells with the exception of those in the extreme northwest portion of Exhibit 1, all of the wells in the Dean Field area are completed in the Devonian or and/or Permo-Penn reservoirs of the Dean Field.

Q Now, referring to what has been marked Exhibit No. 2, will you explain that to the Examiner?

A Exhibit 2 is more of a detailed map of the Dean Field area. The wells that are colored blue are present

current producing wells in the Permo-Penn zone. The wells that are colored yellow are the present current producing wells in the Devonian zone. The wells that are represented by an uncolored half circle to the right are depleted, shut-in Permo-Penn wells and the wells that are shown with a half, uncolored half circle to the left are depleted shut-in Devonian producing wells. Some of the wells have a full circle on them and those wells are dually completed in the Dean Devonian and Dean Permo-Penn.

Q You are going to inject your produced water from both Permo-Penn and Devonian, is that right?

A Yes, sir.

Q How many wells, can you locate the wells that will actually be on this injection system?

A Yes, the wells in the northern part of the reservoir operated by Gulf and Humble are not included in this system. All of the wells in the southern half of the reservoir are included in the system except the Humble "AP" Well No. 1. Apparently the Atlantic well is not producing water at the present time, or if it is, that water is not at the present time being disposed of by the system.

Q Now, you have a current salt water disposal well for the system now, is that right?

A Yes, sir. We had a well, the location of which is identified on Exhibit 2. There's an arrow pointing to an ex-Carrollton "B" well, it was a Permo-Penn test, it was a dry hole at 1959. Sinclair received administrative approval to dispose of salt water in that well by virtue of administrative Order SWD-13 dated May 19, 1958.

Q What happened with that well?

A We have been disposing of water in that well since that time and we have had several workovers on the well, the well has had some difficulty in the last eight or nine years, we have had casing leaks once which we repaired. We had to acidize the injection interval several times. We have two fishes in the hole now, we are injecting below a packer with the annulus filled with corrosion-inhibited fluid, so we do have the well under control. However, the injection pressures are high and are 2,000 pounds and if we have any difficulty, more difficulty with this well we feel it is beyond further repair and we will not be able to have a place to put the salt water, so that's the purpose of this application, is to get a substitute well.

Incidentally, we do, if this application is approved, we do want to keep the present salt water disposal well on a standby basis, in case of emergency we can divert

salt water to this well.

Q What is the anticipated total volume of water that will be injected into the proposed well in the two zones?

A We are currently disposing about 35,000 barrels per month into the present well and we anticipate this volume will stay about the same, about 35,000 barrels per month.

Q You are going to be injecting into the Permo-Penn, of that 35,000 about how much is Permo-Penn water?

A Oh, about eight or nine thousand barrels is Permo-Penn water and the balance is Devonian water.

Q Do you feel that this added volume of water into the Permo-Penn will have any particular effect on production of wells in the Permo-Penn?

A Well, as you can see from Exhibit 2, we have Permo-Penn completions distributed over a two and a half-square mile area regularly spaced and we have given a great deal of study to waterflooding secondary recovery methods that might be applicable to this reservoir, and it's our best engineering estimates that the reservoir does not lend itself to secondary recovery, so I would say that any time you inject a fluid into a reservoir, that you do have some effect on the reservoir. I do not believe that it will have an adverse effect. I believe by careful observation of these completed wells all

around the proposed injection well, we may learn something that our calculations and studies, we may learn something from the actual injection with volumes of this amount. We may find maybe that we could do something in the reservoir. It could have a very beneficial effect.

Q Referring to Exhibit No. 3, which is your diagrammatic sketch, would you explain that installation?

A Yes. And I revised the diagrammatic sketch from the one that I submitted with my application for this hearing. I have several extra copies. I believe one has been marked as Exhibit 3. The Commission has three sets of this in their file.

Q The one that has been marked is the revised?

A The one that is marked is the revised one. Exhibit 3 reflects the status of the Cities Service State "AW" Well No. 4. We have 13-3/8ths-inch O.D. surface pipe and set with 350 sacks of cement. I assume that the cement circulated. It was not reported as such by Cities Service, but that amount of cement is usually sufficient in this area to circulate, or it may have been filled up from the surface.

There is a second string set at 8-5/8ths-inch O.D., set at 4924, cemented with 1983 sacks, and this cement circulated to the surface, so we have cement behind the 8-5/8ths

to the surface, which includes the annulus of the 13-3/8ths-inch pipe. There is 5-1/2-inch pipe set with 350 sacks at 11,595. The top of cement at that time was ascertained to be at 10,310. However, in completing the well, the well was perforated in the vicinity of the proposed perforations for salt water disposal and found to be water-bearing and re-cemented, and a new top of cement, which is not shown on the revised exhibit, was found to be at 9,975 feet. So we have cement behind the 5-1/2-inch pipe from 9,975 feet down to T.D.

The Exhibit 3 reflects the existing oil perforations at the bottom of the well, two sets of them; one is in the, the upper set is in the Upper Pennsylvanian formation. The lower set is in the Strawn. Those are the present depleted producing zone of that well.

I show a proposed bridge plug at 10,650 feet, we will dump two or three sacks of cement on top of that plug when we set it. The purpose of that plug is to prevent any of the water we inject from getting into those perforations.

Sinclair originally proposed to put the water in those perforations in our application but Mobil Oil Company has requested at first that we don't put water in there because their well is presently, their offset well is

presently producing from those perforations and they did not want us to put large volumes of water in there. So we are going to put the bridge plug there to prevent the water from getting into the two bottom sets of perforations, and we are going to open up and perforate the Wolfcamp and Upper Penn from 10,434 to 44, and from 10,468 to 88, as shown on our Exhibit 3.

We do not anticipate we will have any difficulty whatsoever getting the volumes of water, thousand plus barrels a day, into those perforations.

Q This bottom plug is the revision that you referred to earlier, is that right, from the application?

A Yes, that necessitated the revision.

Q Will you have inhibited fluid in your annulus?

A Yes. We will have corrosion-inhibited fluid in the annulus. We will have a Model "D" packer set at 10,400 feet. We have plastic-lined tubing. We don't anticipate that we will have any corrosion problems.

Q Is there any fresh water in the area?

A Yes, the Ogallala formation is present and the bottom of that formation is at about 300 feet. We have the surface casing cemented through the Ogallala, we have the 8-5/8ths cemented through the Ogallala. We have a string of

5-1/2 and we have corrosion-inhibited fluid in the annulus and plastic-lined tubing, so it would be impossible for the injected salt water to contaminate the Ogallala without us knowing.

Q What do you anticipate your injection pressures will be?

A Well, we hope that they won't be very high. Our equipment is able to inject as much as 2,000 pounds, which is what we are currently injecting at, so we hope that they won't be anywhere near that.

Q Exhibit 4 is the standard application form of the New Mexico Oil Conservation Commission for injection of salt water. Do you have anything you want to add to that exhibit?

A Yes. We'll have to delete under the line that calls for the proposed intervals of injection, the last two sets of perforations will have to be deleted. We aren't going to ask for those at this time due to Mobil's objection.

Q And Exhibit 5 is the log of the proposed injection well, is that right?

A Yes, sir. And I have marked the four sets of perforations that are in the well, I have marked on the Commission's copy of the log on the well.

Q Were Exhibits 1 through 5 prepared by you or under

your supervision?

A Yes, sir, they were.

MR. KELLY: I move the introduction of Sinclair's exhibits.

MR. NUTTER: Sinclair's Exhibits 1 through 5 will be admitted in evidence.

(Whereupon, Exhibits 1 through 5 were offered and admitted in evidence.)

MR. KELLY: That's all we have on direct.

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Anderson, now your Exhibit 3 shows the top of the cement on the long string at 10,310. You say you have a new top for that?

A Yes. In completing the well they selectively perforated and tested these various zones behind the pipe. When they originally ran the pipe and set it with 350 sacks, why, the top was at 10,310. However, when they perforated 10,434 to 44 and 10,468 to 88, the same interval that we are going to perforate for salt water disposal, and got a salt water test from those perforations, why, they squeezed those perforations and brought the cement up behind the pipe to 9,975 feet.

Q So, in effect, that's another revision on these exhibits that were submitted with the application?

A Yes, sir.

Q We'll change the top of the cement, then, to 9,975?

A Yes, sir.

Q Now, these upper perforations which are the ones that you have left after revising your program, are this first set, 10,434 to 44 and 10,468 to 88, are they all in the Wolfcamp?

A Yes. They are both, those two zones are in the Wolfcamp, yes, sir. The top of the Pennsylvanian in this well is 10,645.

Q So you won't have any Pennsylvanian disposal at all here?

A No.

Q What interval is this Cities Service "AW" No. 3 to the west of the disposal well completed in?

A My information is that the No. 3 well is completed in all four zones, the Wolfcamp, the Upper Penn and the Strawn.

Q You don't have a structure map here. Where would it be in relation to the No. 4?

A It's up-structure from the No. 4 well.

Q Could you, when you get home, find out what the

subsea elevation of the perforations in the Wolfcamp in your disposal well are and what the subsea elevation of all of the perforated intervals in the State "AW" No. 3 would be?

A Okay.

Q I believe the same would hold true for the Humble "AP" No. 1. Those are the nearest wells to the proposed disposal well with the exception of the Mobil well, and by the elimination of these two lower sets of perforations we are evidently protecting it. So we would have the Humble well to the northeast and the Cities Service well to the west that we would need the subsea perforation.

A Yes, the Humble well is, I believe, as much a Strawn completion in the very bottom set.

Q Well, you could find out and let us know.

A Okay. Apparently Cities Service feels that they would be adequately protected in that they have sold us Well No. 4 for this purpose.

Q Now, this annulus will be loaded with a corrosion-inhibited fluid, will it be left open or equipped with a pressure gauge to detect leakage?

A It would be closed in. I don't know whether it would be equipped with a pressure gauge, but it would be equipped with provision to take pressures on it.

Q We can get a gauge and leave on it, can't we?

A Yes.

MR. NUTTER: Are there any other questions of Mr. Anderson? He may be excused.

(Witness excused.)

MR. NUTTER: Do you have anything further, Mr. Kelly?

MR. KELLY: No, I don't.

MR. NUTTER: Does anyone have anything further to offer in Case 3781?

MR. HATCH: The Commission did receive a letter from Mobil Oil Corporation in which they say, "Please be advised if water is not injected into the interval 10,685, 10,694 in State "AW" Well No. 4, then Mobil has no objection to this application."

MR. NUTTER: Well, Andy gave us a promise.

MR. ANDERSON: Yes, I am not asking for approval to put it in that interval.

MR. NUTTER: Anything further in this case? We will take the case under advisement.

Whereupon, further testimony was offered in Case 3781 as follows:

MR. KELLY: In Sinclair's Case 3781 which was heard

previously this morning, you asked for certain information concerning offset wells and their subsea strata. We have that information and tender it as Exhibit No. 6 to the application and move the introduction of Exhibit 6.

(Whereupon, Exhibit No. 6 was marked for identification.)

MR. NUTTER: Exhibit No. 6?

MR. KELLY: Yes.

MR. NUTTER: Exhibit No. 6 in Case 3781 will be entered in the record of that case.

(Whereupon, Exhibit No. 6 was offered and admitted in evidence.)

I N D E X

STATE OF NEW MEXICO)
) ss
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Notary Public in and for the County of Bernalillo, State of New Mexico, do hereby certify that the foregoing and attached Transcript of Hearing before the New Mexico Oil Conservation Commission was reported by me; and that the same is a true and correct record of the said proceedings, to the best of my knowledge, skill and ability.

Witness my Hand and Seal this 8th day of July, 1968.

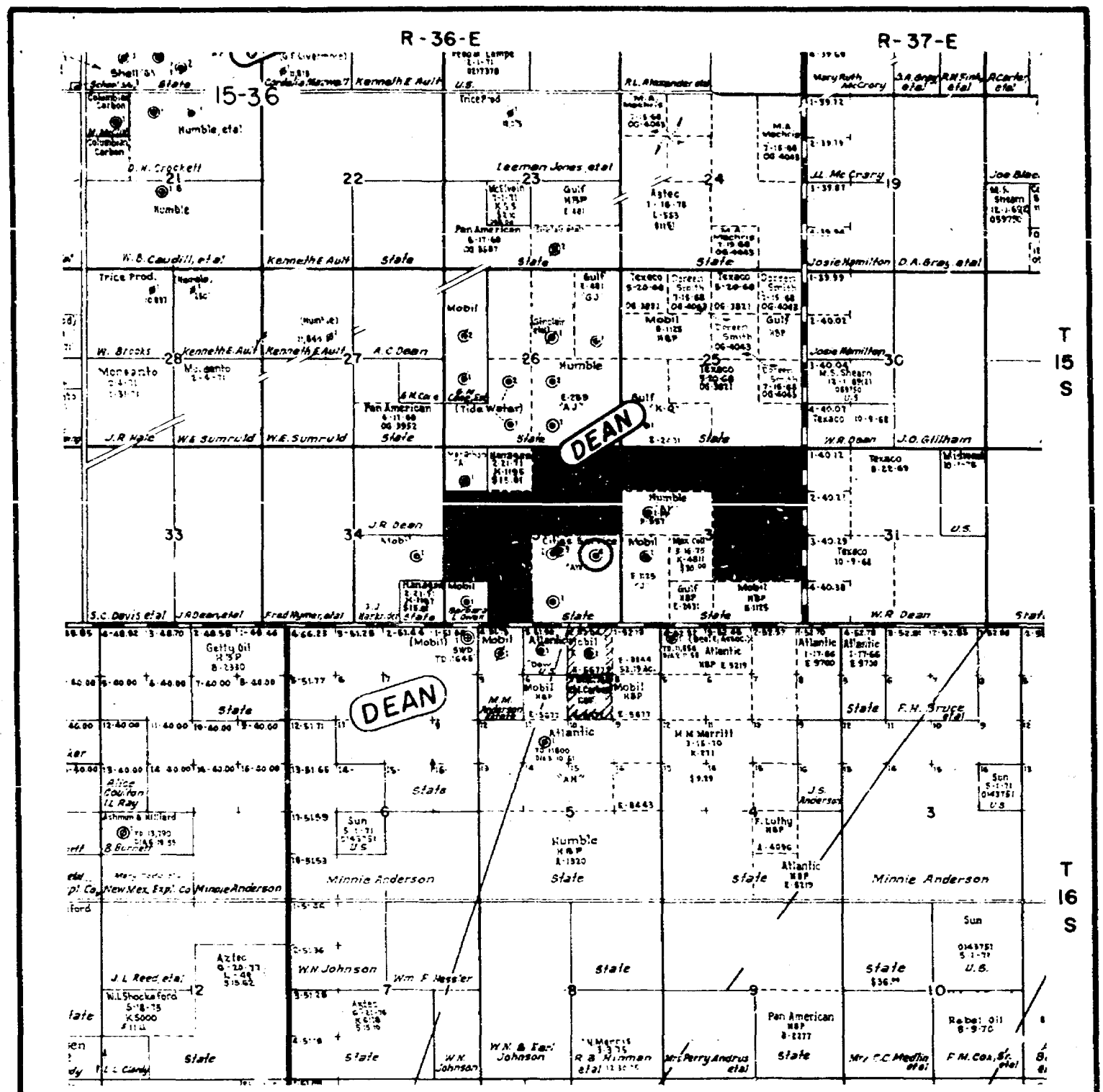
Ada Dearnley
NOTARY PUBLIC

My Commission Expires:

June 19, 1971.

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 3781, heard by me on 6/5, 1968.

Examiner
New Mexico Oil Conservation Commission



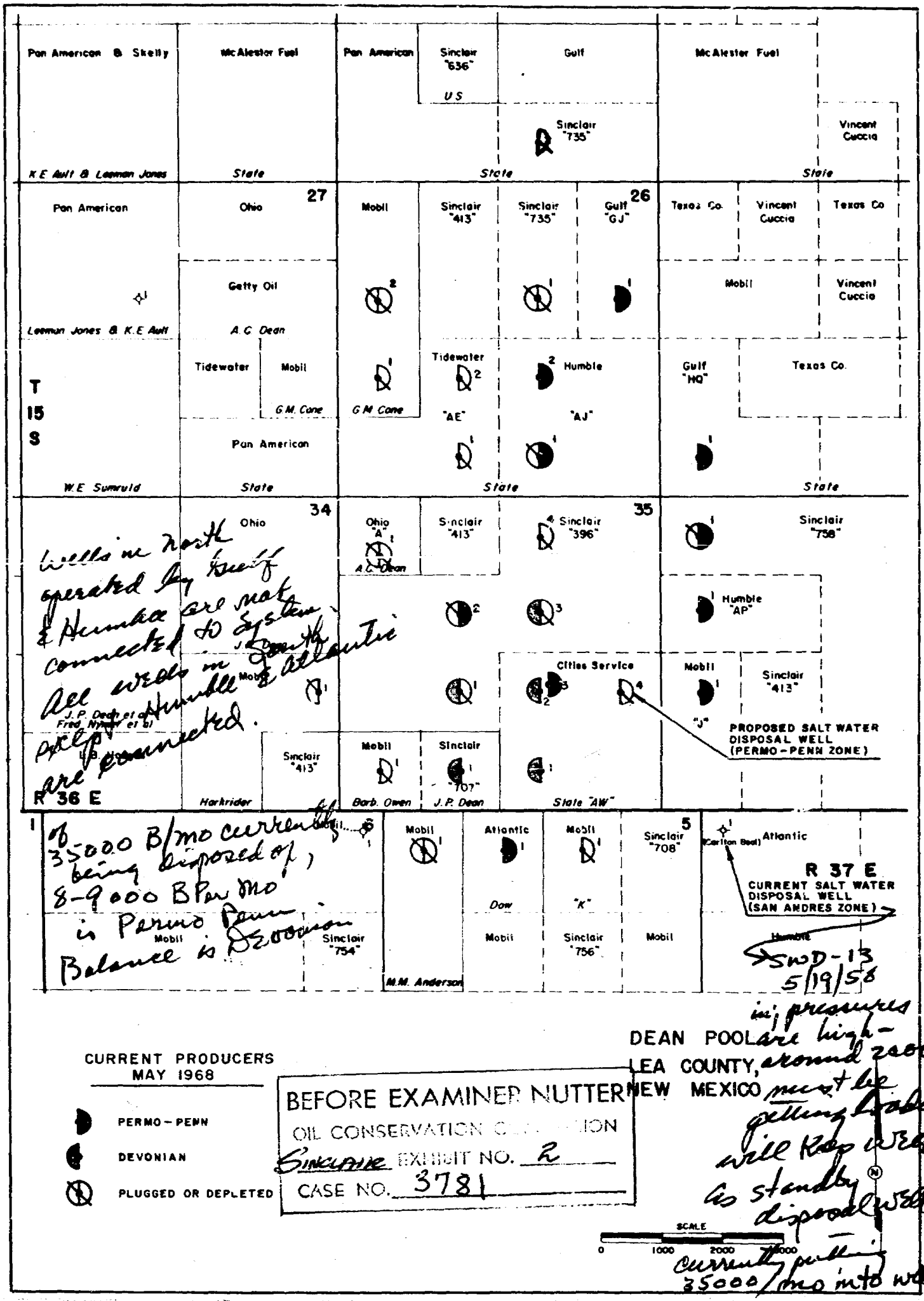
BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
SINCLAIR EXHIBIT NO. 1
CASE NO. 3781

SINCLAIR OIL & GAS CO.
MIDLAND, TEXAS

PART OF

LEA COUNTY, NEW MEXICO

DRAWN BY _____ CHECKED BY _____ DATE _____
SCALE - 1" = 4000' REVISED _____



wells in North operated by Sinclair & Humble are not connected to System. All wells in South & Atlantic are connected.

of 35000 B/mo currently being disposed of, 8-9000 B Per Mo is Permo Penn. Balance is Devonian

DEAN POOL, LEA COUNTY, NEW MEXICO

inj pressures are high - around 2500 must be pulling heads will keep well as standby disposal well

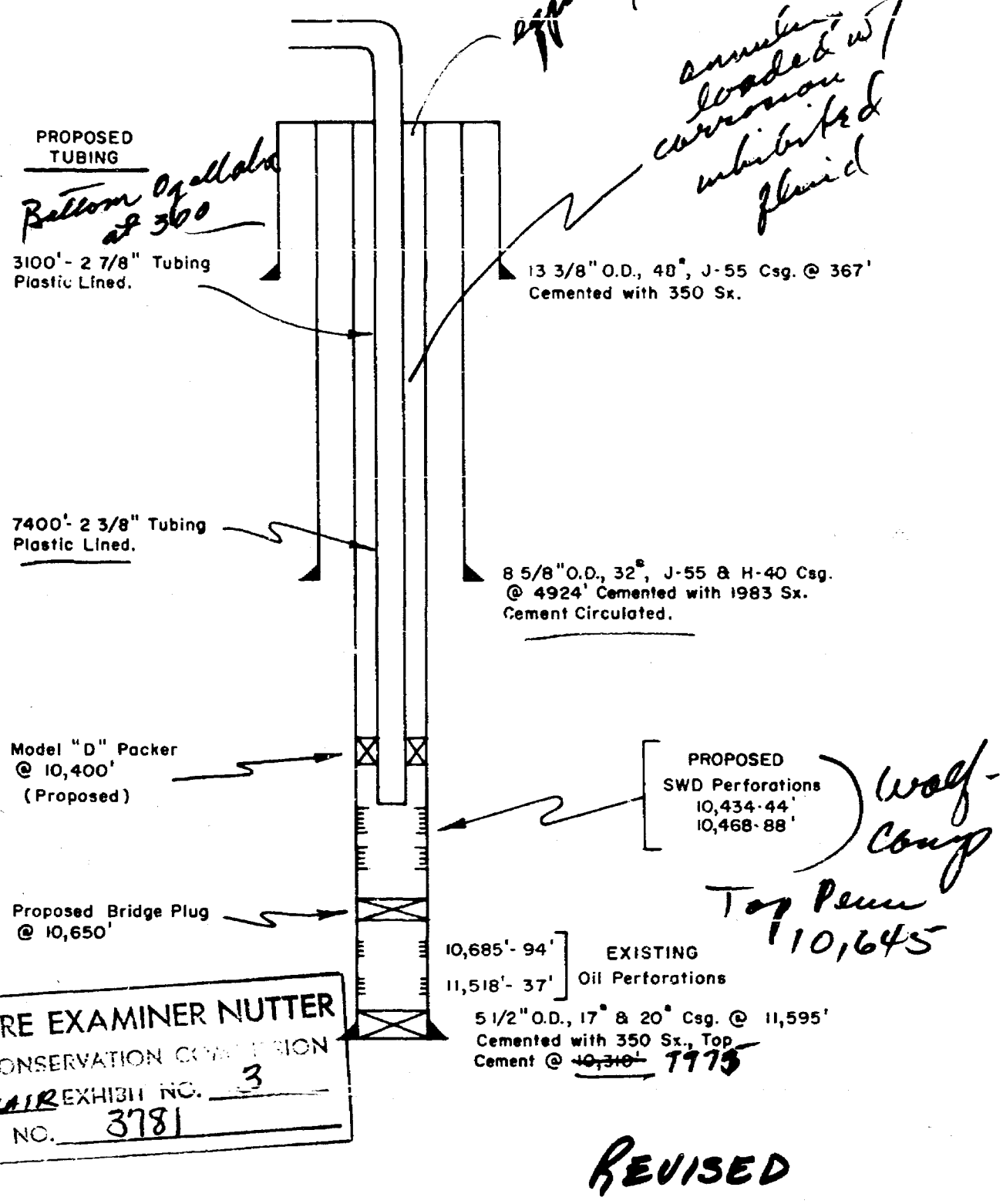
currently pulling 35000/mo into well

DEAN POOL SALT WATER DISPOSAL SYSTEM

SINCLAIR OIL & GAS CO.- OPERATOR

PROPOSED SALT WATER DISPOSAL WELL

(CITIES SERVICE STATE "AW" WELL NO. 2)



BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
SINCLAIR EXHIBIT NO. 3
CASE NO. 3781

REVISED

Form C-108
Revised 1-1-65

NEW MEXICO OIL CONSERVATION COMMISSION

APPLICATION TO DISPOSE OF SALT WATER BY INJECTION INTO A POROUS FORMATION

OPERATOR	ADDRESS
SINCLAIR OIL & GAS COMPANY for the Dean Pool Salt Water Disposal System.	P. O. Box 1920, Hobbs, New Mexico 88240

LEASE NAME	WELL NO.	FIELD	COUNTY
State "AW"	4	Dean Permo-Pennsylvanian	Lea

LOCATION

UNIT LETTER I ; WELL IS LOCATED 1980 FEET FROM THE South LINE AND 660 FEET FROM THE East LINE, SECTION 35 TOWNSHIP 15S RANGE 36E NMPM.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
SURFACE CASING	13 3/8"	367	350	Unknown	-
INTERMEDIATE	8 5/8"	4924	1983	Circulated to surface	
LONG STRING	5 1/2"	11,595	350	10,310	Survey
TUBING	3100' of 2 7/8" and 7400' of 2 3/8" 10,500'		NAME, MODEL AND DEPTH OF TUBING PACKER: Model "D" @ 10,400'.		

NAME OF PROPOSED INJECTION FORMATION	TOP OF FORMATION	BOTTOM OF FORMATION
Permo-Pennsylvanian	10,434	11,537

IS INJECTION THROUGH TUBING, CASING, OR ANNULUS?	PERFORATIONS OR OPEN HOLE	PROPOSED INTERVAL(S) OF INJECTION
Tubing	Perforations	10,434-44, 10,468-88, 10,685-94, 11,518-37.

IS THIS A NEW WELL DRILLED FOR DISPOSAL?	IF ANSWER IS NO, FOR WHAT PURPOSE WAS WELL ORIGINALLY DRILLED?	HAS WELL EVER BEEN PERFORATED IN ANY ZONE OTHER THAN THE PROPOSED INJECTION ZONE?
No	Well is a depelted oil well.	No

LIST ALL SUCH PERFORATED INTERVALS AND SACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH

None

DEPTH OF BOTTOM OF DEEPEST FRESH WATER ZONE IN THIS AREA	DEPTH OF BOTTOM OF NEXT HIGHER OIL OR GAS ZONE IN THIS AREA	DEPTH OF TOP OF NEXT LOWER OIL OR GAS ZONE IN THIS AREA
Approximately 300 ft.	None	Devonian @ 13,700'

ANTICIPATED DAILY INJECTION VOLUME (BBLS.) MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM	IS INJECTION TO BE BY GRAVITY OR PRESSURE?	APPROX. PRESSURE (PSI)
900	1200	Closed	Pressure	1950

ANSWER YES OR NO WHETHER THE FOLLOWING WATERS ARE MINERALIZED TO SUCH A DEGREE AS TO BE UNFIT FOR DOMESTIC, STOCK, IRRIGATION, OR OTHER GENERAL USE —	WATER TO BE DISPOSED OF	NATURAL WATER IN DISPOSAL ZONE	ARE WATER ANALYSES ATTACHED?
	Yes	Yes	

NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND)

Mr. C. E. Alexander, Tatum Highway, Lovington, New Mexico

LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (½) MILE OF THIS INJECTION WELL

Mobil Oil Corporation, P. O. Box 633, Midland, Texas 79701

Humble Oil & Refining Company, P. O. Box 1600, Midland, Texas 79701

Atlantic-Richfield Company, P. O. Box 1978, Roswell, New Mexico 88201

HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?	SURFACE OWNER	EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL	THE NEW MEXICO STATE ENGINEER
	Yes	Yes	No
ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)	PLAT OF AREA	ELECTRICAL LOG	DIAGRAMATIC SKETCH OF WELL
	Yes	Yes	Yes

BEFORE EXAMINER NUTTER
OIL CONSERVATION COMMISSION
Sinclair EXHIBIT NO. 4
CASE NO. 3781

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

S. M. Lindeman — Region Regulatory Engineer — 5-14-68

(Signature) (Title) (Date)

NOTE: Should waivers from the State Engineer, the surface owner, and all operators within one-half mile of the proposed injection well. not accompany this application, the New Mexico Oil Conservation Commission will hold the application for a period of 15 days from the date of receipt by the Commission's Santa Fe office. If at the end of the 15-day waiting period no protest has been received by the Santa Fe office, the application will be processed. If a protest is received, the application will be set for hearing, if the applicant so requests. SEE RULE 701.

Ex No B
Cs 3781

Case 3781

Oper + Well	Elev.	Producing Int.	Subsea Depths
Cities Service AW #4 (Disposal Well)	3863	10434 - 44 10468 - 88	✓ -6566 to -6576 -6600 to -6620
Cities Serv. AW #3 (June Allowable = 10 BBLS/DAY)	3859	10396 - 408 10443 - 10483 10641 - 675 11505 - 525	✓ -6537 to -6549 ✓ -6584 to -6624 -6782 to -6816 -7646 to -7666
Humble AP #1 (June Allowable = 22 BBLS/DAY)	3854	11544 - 568	-7690 to -7714

Average Allowable June 1968 Lerno Penn

10 Wells with average of 30 BBLS/DAY

Lincoln Oil & Gas Co Lea

Dean/Pool SWD System

Cibola Serv. 54 AW #4

1980 FSL 660 FEL

35 15S 36E

Permo Penn 10,434 - 11,537