

CASE 4256: Appli. of SOUTHWESTERN  
NATURAL GAS FOR A DUAL COMPLETION  
AND SALT WATER DISPOSAL.

Case Number.

4256

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Application

Transcripts.

Small Exhibits

ETC.

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SPECIALIZING IN: DEPOSITIONS, HEARINGS, STATEMENTS, EXPERT TESTIMONY, DAILY COPY, CONVENTIONS

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BEFORE THE  
NEW MEXICO OIL CONSERVATION COMMISSION  
Roswell, New Mexico  
November 19, 1969

REGULAR HEARING

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IN THE MATTER OF: )

Application of Southwestern Natural )  
Gas, Inc. for a dual completion and )  
salt water disposal, Lea County, New )  
Mexico. )

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) Case No. 4256  
)

BEFORE: A. L. Porter, Examiner.

TRANSCRIPT OF HEARING

MR. HATCH: Case 4256. Application of Southwestern Natural Gas, Inc. for a dual completion and salt water disposal, Lea County, New Mexico.

MR. DUTTON: If it please the Commission, I am Grandvill Dutton, a member of the Texas Bar, associated with Jason Kellahin, a member of the New Mexico Bar.

I would like to appear on behalf of Sun Oil Company in opposition to the request.

MR. PORTER: Your appearance will be noted, Mr. Dutton, and also the fact that Mr. Kellahin previously made an appearance.

MR. HINKLE: If the Commission please, Clarence Hinkle, Hinkle, Bondurant and Christy, Roswell, appearing on behalf of Southwestern Natural Gas. We have one witness which I would like to have sworn.

(Witness sworn.)

(Whereupon, Applicant's Exhibits 1 through 4 were marked for identification.)

WILLIAM E. HENDON, JR.

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

DIRECT EXAMINATION

BY MR. HINKLE:

Q State your name and your residence and by whom

you are employed.

A My name is William Hendon, Jr. I reside in Midland, Texas. I am employed by Southwestern Natural Gas, Incorporated as production engineer.

Q Are you a graduate engineer?

A I am a graduate geologist. I have worked as an engineer since graduating.

Q Have you previously testified before the New Mexico Oil Conservation Commission?

A Yes, sir, I have.

Q And qualified as a geologist and petroleum engineer?

A I have.

Q Your qualifications are a matter of record with the Commission?

A Yes, sir, they are.

Q Are you familiar with the Southwestern Natural Gas operations in New Mexico?

A Yes, sir, I am.

Q Are you familiar with their application in this case, 4256?

A Yes, sir.

Q What is Southwestern Natural Gas seeking to

accomplish by this application?

A We seek to produce the TP State Four Well No. 1 as an oil well and inject produced water into the annulus to dispose of that produced water from this well.

Q When was this well completed?

A The well was completed in September of 1969 and was recently potentialled for 110 barrels of oil per day and 185 barrels of water per day.

Q You have had it on production since completion?

A Since potential; yes, sir.

Q Where are you disposing of the water at the present time?

A At the present time it's going into the stock tank.

Q Have you prepared or has there been prepared under your supervision certain exhibits for introduction in this case?

A Yes, sir, there have been.

Q Will you refer to Exhibit No. 1 and explain to the Commission what this shows?

A Exhibit No. 1 is a plat of the area showing wells in the Inbe Permo Penn Field, Lea County, New Mexico, Range 34 East, Township 11 South.

Colored in yellow in Section No. 4 is the 80-acre proration unit of Southwestern Natural Gas, designated the TP State 4 Well No. 1. Also shown on this plat are other wells in this vicinity.

Q Is the acreage of the application shown in yellow?

A Yes, it is.

Q And the proposed injection wells dual completion in red?

A That is correct, sir.

Q Are all the wells shown on Exhibit No. 1 producing from the same formation?

A To the best of my knowledge they are.

Q What formation is that?

A This is generally called the Bough C.

Q The Pennsylvanian Formation?

A Permo-Pennsylvanian; yes, sir.

Q What is the depth of this well?

A TD is ten thousand plus; the producing interval is 9978 to 9970 -- correct that.

Q Do you have any further comments with respect to Exhibit No. 1?

A No, sir.

Q Refer to Exhibit No. 2 and explain what it shows.

A Exhibit No. 2 is a schematic diagram of the well showing the surface casing, intermediate casing and the production casing, as well as the tubing.

It also shows the perforations in the Bough C from 9972 to 9978, which is the current producing zone. The surface casing is 13 and 3 eighths inches set at a depth of 360 feet and cement circulated to the surface.

The intermediate casing was set at 4150 feet. 8 and 5 eighths inch casing cemented with 400 sacks of cement. Top of that cement is 2300 feet. Production casing is four and a half inch, set at 10,013 feet and 7 and 7 eighths hole cemented with 400 sacks of cement.

Top of the cement is at 8500 feet. This also shows the intervals open to injection, which would be from the casing shoe of the intermediate string to the top of the cement on the production string. That would be an interval of 4350 feet or from 4150 to 8500 feet.

The formations that are open in this interval are the San Andres at 4,040, Glorietta at 5480 feet, the Tubb at 6935 and the Abo at 7772.

Q Is this an unusual procedure to produce oil



from one formation and inject produced water into the annulus for disposal?

A No, sir; it is not.

Q To your knowledge has there been any other approval of similar completions by the Commission?

A Yes, sir, there have. One in particular; Western States Producing Company in Smelting State No. 1, which is six miles south of the proposed well, a very similar type completion and mechanical hook-up.

Q Did you testify in that case that you refer to?

A Yes, sir, I did.

Q That was Case No. 4097, and do you know when the Commission entered its order approving this method of disposal of water?

A I don't remember the exact date, but it was in April, I think.

Q I have a copy of the order. The date is April 15, 1969, and the order is No. R-3730. Now, in that particular case was water disposed of in these same formations; that is, the San Andres, Glorietta, Tubb and Abo?

A Yes, sir.

Q And they are identical to the formation in which you propose to dispose of the water in this case?

A That is correct.

Q How far from the subject well is the well which we have just referred to of the Western States Producing Company, which was covered by Order R-3730?

A It's approximately six miles to the south. It's in Section 9, Range 34 East, Township 12 South.

Q Now, in that case, the production was also from the Bough C Formation?

A Yes, sir.

Q So, it's almost an identical case to this case, is it not?

A It is a parallel case.

Q How much water is the proposed injection well producing at the present time?

A At the present time, 185 barrels per day.

Q Have you made any tests to determine whether or not this water can be disposed of in the manner in which you have testified?

A The annulus has been tested and it will take water at a lesser pressure than ---

Q Approximately what pressure do you anticipate will be necessary to dispose of this water?

A We anticipate a pressure of less than 400 pounds at the surface.

Q I believe you testified as to the number of feet which is open for disposal in the San Andres, Glorieta, Tubb and Abo Formations. You might repeat again how much surface you have exposed.

A The vertical extent of the injection zone is 4350 feet.

Q What is the character of these formations in which you propose to inject the water?

A They are generally limestone formations; some shale.

Q Would you say that they are porous and permeable and will take the water?

A Yes, sir, they will.

Q With this much exposure open hole and I believe you also testified as to the closest producing well. In your opinion, would the injection of water or disposal of water in this well interfere with any of the producing wells in the vicinity?

A It's my contention that it will not interfere with the operation of any well in the vicinity.

Q What do you base that on?

A The extent of the zones that we will be injecting into is such vertical extents that the amount

of water injected will be dissipated over a large area.

Q Do you anticipate that the injection of water into the annulus of this well will have any effect on your producing well?

A No, sir, we do not. If we anticipated any problems in that, we certainly would not propose to inject this water.

Q If there is any danger of collapsing casing in adjoining wells there would still be more danger, would not there, in collapsing the casing in your own well?

A Yes, sir. Our own well being close to the pressure point would be the first to show danger.

Q In your opinion, if you do not inject at a higher pressure than 400 pounds, is there any chance the collapsing casing would interfere with your production from the subject well?

A No, sir. In my opinion, I see no reason why it would collapse casing. Casing set at this depth is of such metallurgical characteristics that it will stand much more pressure than will be applied.

Q Now, refer to Exhibit No. 3 and explain to the Commission what this is.

A This is an acoustic log of the well, which was run in --

Q We only have one copy of this log. There was one copy filed with the application. That's all we have.

MR. PORTER: I believe Mr. Nutter of the staff has one.

THE WITNESS: This is an acoustic log run at the time the well was drilled showing the formations penetrated, showing our completion intervals and the intervals open to injection.

Q (By Mr. Hinkle) Can you tell from that log the character of the formations which are open and from the top of the San Andres down to the top of the Bough C Formation?

A Well, zone by zone they vary, of course. But, generally, they are limestones and shale.

Q Are there any impermeable formations on top of the producing zone?

A By impermeable you mean shales or --

Q Yes.

A Yes, sir. There are some shales in through this section.

Q In your opinion, is there any chance of

vertical communication by the injection of this water into the producing zone Bough C Formation?

A I don't foresee any vertical communication problems in the formation.

Q Do you to these impervious formations?

A Yes, sir.

Q What is the character of the water which is being produced and which you propose to inject in the annulus in this well?

A As shown on the Exhibit No. 4, water analysis, the water has a specific gravity of 1.07, chloride count of 53,200 parts per million; no hydrogen sulphide, a faint trace of iron and a PH of six, which is a very neutral water.

Q In your opinion, is this corrosive water which would be dangerous to the casing involved?

A No, sir.

Q Very little chance of corrosion from injection?

A I would feel there would be very little chance of corrosion from this particular water.

Q Now, at the time you filed this application with the Commission did you give notice to the offset owners?

A Yes, sir, we did.

Q Who did you give notice to?

A Sun Oil Company, and Major, Geeble and Forester, and surface owner, Bogle Farms, Incorporated.

Q They are all the offset owners?

A Yes.

Q Did you have any response from them?

A We received affirmative signatures from Major, Geeble and Forester and Bogle, no objections.

Q Did you receive anything from the Sun?

A Yes, sir. We received a letter from the Sun Oil Company saying that they did oppose this application.

Q That's the only one that did indicate any opposition?

A Yes, sir.

MR. HINKLE: We would like to offer in evidence Exhibits 1 through 4.

MR. PORTER: If there is no objection Exhibits 1 through 4 of the Applicant will be admitted into the record.

MR. HINKLE: That's all of our direct.

MR. PORTER: Mr. Dutton, do you have some questions?

MR. DUTTON: Yes, I have a few.

CROSS EXAMINATION

BY MR. DUTTON:

Q Mr. Hendon, with respect to the Western States Producing Company Case in which a similar type injection was approved, was there any testimony in that case with respect to casing collapse pressures on adjacent wells?

A Not that I recall, sir.

Q Upon what do you base your opinion that the injection pressure will be less than 400 pounds per square inch?

A From injection tests in the area.

Q For what period of time were these injection tests conducted and on what well?

A For short periods of time on this well and on the Smelting State Well.

Q Isn't it usual as injection proceeds into an injection well that the injection pressure increase?

A Given enough time it will increase, generally.

Q Do you have any evidence to show into which of the open formations the injected water would enter?

A As far as a tracer survey or something of this nature, no, sir.



Q Have you calculated the pressures at a depth of 4,000 to 5,000 feet that would be encountered as a result of injecting with a 400 pound per square inch surface pressure?

A No, sir. I calculated pressure at 8500 feet and it would be approximately 4300 pounds.

Q Are you familiar with casing string designs in which normally, according to API standards, casings of lesser collapse pressure is used higher in the hole?

A Yes, sir.

Q Have you any information as to what is the casing collapse pressure in your well at a depth of 4,000 to 5,000 feet?

A I can look it up for you.

Q Now, you testified that there was no danger to your well as result of this injection.

A We feel that there is no danger, sir.

Q Did you come to that conclusion without knowing what the casing collapse pressure was between 4,000 and 5,000 feet?

A We have looked into the possibilities.

Q You testified that there was no corrosion problem with this particular water. Are you aware of what

the chloride content of sea water is?

A Right offhand, no, sir.

Q Do you think it's more or less than that particular water?

A I don't really know.

Q Upon what did you base your opinion that there was no corrosion danger from this water?

A From experience in the area, sir.

Q On this particular well?

A This particular well hasn't been operated yet, so I have no experience on this particular well.

Q Would you generally classify sea water as having some corrosive effect on metal?

A Normally, yes, sir.

MR. DUTTON: That's all the questions I have. We have a witness to present.

MR. PORTER: Does anyone else have any questions of this witness? He may be excused.

(Witness excused.)

MR. DUTTON: We have one witness, Mr. Chairman.

MR. PORTER: Does this conclude the testimony?

MR. HINKLE: This concludes the direct testimony.

MR. PORTER: Mr. Dutton, has your witness been

sworn?

MR. DUTTON: No, sir, he has not.

MR. PORTER: Would you have him take the chair  
at the end of the table, please?

(Witness sworn.)

FRITZ BRANDES

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

DIRECT EXAMINATION

BY MR. DUTTON:

Q State your name for the record, please.

A Fritz Brandes.

Q By whom are you employed and where?

A Sun Oil Company in Odessa, Texas.

Q What capacity?

A As a production petroleum engineer.

Q In this capacity, does the area of the Inbe  
Penn Field come under your supervision?

A Yes, sir.

Q Have you had occasion to make a recent study of  
this field with particular reference to the subject matter  
of today's application?

A Yes, sir, I have.

Q Have you testified previously before this Commission as an expert petroleum engineer witness?

A Yes, sir.

MR. DUTTON: Mr. Chairman, we would like to submit the witness's qualifications.

MR. PORTER: The Commission considers the witness qualified.

Q (By Mr. Dutton) Mr. Brandes, have you heard this requested plan of Southwestern Natural Gas for disposal of salt water into the TP State No. 4 Well No. 1?

A Yes, sir.

Q Where is State No. 4 Well No. 1 located with respect to Sun's properties?

A We have two adjacent leases to this particular well. One well direct west offset is State of New Mexico "N" Oil Communitization No. 2. We have a southwest offset; that's State of New Mexico "Q" No. 2.

Q In your opinion, would such disposal adequately prevent waste and protect correlative rights of these adjacent properties?

A No, sir. I don't believe it would.

Q For what reason?

A     Primarily, there's two reasons. First one is that we think it would increase our current water flow out of our 8 and 5 eighths inch casing strings. We are accumulating this water, hauling it for disposal.

Our second reason -- more important than the first, I think -- is the fact that we feel it would increase our formation pressures to expose casing where we are not cemented; could be conducive to collapse casing.

Q     With respect to your first reason, you say that water is flowing out of the annulus in these adjacent wells.

A     Yes, sir; that is correct.

Q     Is this annulus open to the same formations that the Applicant would propose to inject into?

A     Yes, sir, it is.

Q     What are you doing with this water that you are bleeding from the annulus?

A     We are collecting this water in tanks. We have set 250 to 500 barrel tanks on the well location, installed lines and bleed this water at the rate of 7 to 10 barrels a day into these tanks.

In those instances, where we haven't been able to maintain these tanks at these locations, due to the

requirements elsewhere, we have turned this connection into our flow lines.

Q What is the approximate cost of disposing of this water that flows from the annulus?

A Our current contract calls for twenty-two cents for hauling and five cents for disposal, a total of twenty-seven cents.

Q Per barrel?

A Per barrel; yes, sir.

Q Approximately what rate are these wells flowing at from the annulus today?

A We have experienced as high as ten barrels a day and as low as four, overall and the end lease, the particular well that is the closest well to the Applicant is the "N" No. 2 will average seven to ten barrels a day.

MR. PORTER: Is that oil flow?

THE WITNESS: Water flow out the 8 and 5 eighths.

Q (By Mr. Dutton) In your opinion, what would be the effect on this water flow by the result of injection of salt water into the same formations that these annuluses are open to?

A We feel like it would increase. We don't see any possibility of it decreasing with injected water going

in on adjacent wells.

Q In your opinion, is the flow of water, salt water of particular chloride content involved conducive to corrosion?

A Yes, sir, I certainly think it is. It's salty enough to where we have experienced our lines that we are venting from our 8 and 5 eighths to our accumulator tanks salting up. With chloride content of this quantity we are sure that it is corrosive.

Q Would the corrosion problem be aggravated by additional water being flowed?

A I think it would; yes, sir.

Q Referring to the second reason you gave that you said was more important, upon what factual information do you base your opinion that increased pressure in these formations will perhaps exceed the casing collapse pressure of adjacent wells?

A We have calculated on our casing string a collapse of 2400. This is tensile load collapse by API calculations.

With the surface pressure of 400 pounds, we feel like that you will have at least 2585 pounds in the area in the section of the San Andres and this exceeds the

2400 pound collapse pressure.

Q At what depth did you make this calculation?

A Forty-seven hundred feet.

Q At that depth you have a casing collapse pressure of 2400 PSI in what well?

A This is in the "N" No. 2, the adjacent well to the west.

Q Have you any prior personal experience with casing failures in this field?

A Yes, sir. We have had one.

Q What well was that and when did it happen?

A It was on the State of New Mexico "C" Well No. 1. It occurred in March of this year. This well is located approximately two miles to the west. It -- we had a casing collapse at 4383 feet. We repaired it.

Q What formation was opposite the 4380 feet?

A The San Andres Formation.

Q Is this one of the formations that would be open to the injected water on the Applicant's request?

A Yes, sir, it is.

Q What was the cost of repairing that casing collapse?

A Twenty-eight thousand dollars, plus we lost



five weeks of production.

Q Have other operators had casing failures in this area, to your knowledge?

A Yes, sir. I know of several. Immediately to the north, Tenneco has experienced two, one of them opposite the San Andres Formation.

There have been others. I haven't tabulated them, but it's recognized as being a potential operating problem in the general area and most of the operators that I have been in contact with have initiated the same procedures we have of bleeding their 8 and 5 eighths annulus.

Q This procedure of bleeding the annulus is designed to prevent the build-up of pressure that might collapse the casing?

A This is correct; yes, sir.

Q Are you aware of other disposal efforts into the San Andres Formation in this area?

A Sometime ago --- I can't recall exactly how many years, but in the original drilling of the Bough C, in this particular area, Rice Engineering installed a salt water disposal system for the operators and attempted injection into the San Andres Formation.

As the field grew, the volumes of water and the

pressures that were encountered necessary to dispose of the water, they gave up on the San Andres and their disposal wells now are in the Devonian Formation.

Q What other salt water disposal method would be available to the Applicant in this area?

A Well, there is Rice Engineering and Southlane Salt Water Disposal Company is in the area. The New Mexico Salt Water Disposal Company out of Roswell is also in the area.

I do know of one operator that's in the area, has a disposal system the Southland Royalty. I am not aware of what the capacity of their system is at this time, but we are tied into them on some wells.

Q Are you tied into the other two systems on other wells in the area?

A Yes, sir. We are tied into Rice Engineering on the three state leases and we are tied into Southland Royalty on two state leases and we are tied into the New Mexico Salt Water Company on one state lease.

Q Based on your study of this situation, what are your conclusions?

A I feel it would be detrimental to our operations in particular area. I don't think that it would be conducive

to enhance any of our -- well, I don't think it would be conducive to decreasing our operational problems as far as the disposing of our water out of our 8 and 5 eighths.

There is a danger of the casing collapse. I think our increases in water would occur and this would necessarily increase our operating expense of hauling and disposing of that water that we are bleeding at the present time.

Q What method do you think should be used to dispose of this water that is being produced by the offset well?

A Well, I personally believe that there -- one of the disposal systems would be available.

MR. DUTTON: Mr. Chairman, this concludes our direct evidence. The witness is available for any questions anyone might have.

MR. PORTER: Do you have any questions of the witness?

CROSS EXAMINATION

BY MR. HINKLE:

Q If this pressure is kept at 400 pounds or below in the injection of water, in your opinion would it endanger your wells in any way?

A Well, I don't know what you mean by "below," Mr. Hinkle. Our calculations show that a surface injection pressure of 400 pounds would exceed our designed limit, yes, sir.

Q What weight casing do you have in your well?

A We have 14 pound casing opposite this interval.

Q Do you have any information as to what the collapse pressure would be on 14 pound casing?

A I can get it out of the same book that you have. I have it here in my briefcase.

Q Isn't it a fact that it's 7,150 pounds?

A I would have to verify it from the table, but this isn't loaded tensile collapse that I think you are looking at.

MR. HINKLE: I believe that's all.

MR. PORTER: Mr. Nutter, do you have a question?

CROSS EXAMINATION

BY MR. NUTTER:

Q Mr. Brandes, these wells of yours over in Section 4 and 9 where you are having to bleed this pressure off of the 8 and 5 eighths inch annulus, I presume your pay is at approximately 10,000 feet in there?

A Yes, sir.

Q And you have the pipe set down there that pay?

A Yes, sir.

Q How much cement did you normally use on that pipe?

A On our oil string?

Q Yes, sir.

A Our top of cements very slightly. Most of them will run around 8500, but I think we have one at 87 and maybe one or two at 83 or 8350.

Q Normally, though, the top of the cement would be at approximately 8500 feet?

A On your zone that is open like our 8 and 5 eighths is -- we are set approximately just like the offset 4040 feet on our 8 and 5 eighths and our five and a half is bottomed at 10,016 with top of the cement coming back up to -- on one well it's 8250 to 85.

Q So, you have 1500 feet of cement above the Bough pay then?

A Yes, sir, above the Bough pay.

Q And in all probability the water is not coming from the producing zones down there?

A No, sir. We don't feel like it is. In fact,

this was one of the first things we investigated. We did obtain a water analysis on the water that we are bleeding out of our 8 and 5 eighths and with our lab on a comparison with our produced water told us they were unable to classify the water sample.

It wasn't representative formation of the Bough C.

Q Now, over in the vicinity of Section 7 where you had the casing collapse, do you have to bleed pressure off over there, too?

A Yes, sir. We have ten wells on five state leases and we are bleeding all of them.

Q Are there any disposal wells in the San Andres, the Glorietta, the Tubb or the Abo Formations in this general vicinity?

A At the present time I am not aware of any. I do know that the New Mexico Salt Water Disposal Company purchased these deep holes in order to go on down to the Devonian for disposal.

I know there have been attempts in the past possibly to get into the San Andres, but it's kind of a term what most of the operators use as a pressure formation due to the previous injection original drilling of the

field.

Q How about when you have drilled the wells? Have you had any flow from these formations when you are drilling through them?

A No, sir. Of course, we drill with water through this zone. We are not muddied up and we haven't noticed any particular kick or anything.

Q If the pressure is not bled off of the annulus, what happens? You have a build-up of pressure on that annulus?

A Yes, sir, it will build.

Q What is the highest you have seen that annulus build up?

A In fact, we tested one and it went as high as 940 pounds.

Q At the surface?

A At the surface. This is on the C lease. We ran the test just to determine what kind of pressure we might --

Q That's where you had the collapse, too, wasn't it?

A There's where we had the collapse. We have tested and put gauges on the other wells and normally --

it just depends on how long you leave them shut in, Mr. Nutter.

MR. NUTTER: That's all. Thank you.

MR. PORTER: Mr. Brandes, thus far you have testified there have been casing collapse in the area, but none of them thus far have been attributable to salt water disposal.

THE WITNESS: Not to my knowledge, Mr. Porter. Most of the collapses that have occurred have been opposite the San Andres Formations. This is the information that I have learned from talking to the other operators.

They don't attribute it to anything in particular except from this previous history of disposal in the San Andres. This is the area generally speaking from 4300 to 5500 is where the collapses have occurred.

MR. PORTER: Thank you.

MR. DUTTON: I had an additional question.

Mr. Brandes, with respect to Mr. Hinkle's question about the design collapse pressure, would you explain to the Commission why you used the 2400 pound figure that you gave.

THE WITNESS: Well, this 2400 figure, this is the collapse rating of the pipe with the tensile load.



MR. DUTTON: In other words, as it is currently installed in the hole, this is the casing collapse pressure?

THE WITNESS: Yes, sir, because you have the tensile load on the pipe below this point.

MR. DUTTON: Thank you. That's all the questions I have.

MR. PORTER: Mr. Hinkle, do you have any further questions of this witness?

MR. HINKLE: I think I'll put Mr. Hendon back on.

MR. PORTER: If no one has any further questions of Mr. Brandes, he may be excused.

(Witness excused.)

REDIRECT EXAMINATION

BY MR. HINKLE:

Q Mr. Hendon you have heard the testimony introduced by Sun in this case. Is it your intention that water be disposed of at pressures in excess of 400 pounds?

A No, sir.

Q In other words, you are going to keep it at a pressure which will not be dangerous to your own well; is that right?

A Very definitely.

Q You have heard the testimony then with respect to the collapse pressure of the casing and the adjoining wells and in this well. Do you have any further comment to make with respect to that?

A Well, according to the specific gravity of this particular water at a depth of 4,000 feet, I calculate it to be slightly less than 2200 pounds bottom hole pressure with a 400 pound surface pressure.

Now, this is certainly within the designed limits of Mr. Brandes' statements. Also, I believe Mr. Brandes indicated that they had a collapse design of 2500 - 2550, maybe.

That, I believe, would indicate a very light weight pipe which would not be -- under a normal casing design, would not be run in a well of this depth.

Q So, in your opinion, there's no danger by the injection of this water at 400 pounds or less in your well to the collapse of casing in any of the adjoining wells?

A I don't see any danger really in our well and certainly in a well half a mile away is going to be affected at a later time than ours would be; it would show up in ours first.

Q Now, in connection with your study and investigation of this area, do you know of any well in the area where there has been collapse of the casing on account of injection for disposal of salt water?

A I am unaware of any case attributed directly to that.

Q Of any well?

A Of any well.

MR. HINKLE: That's all.

RECROSS EXAMINATION

BY MR. DUTTON:

Q Mr. Hendon, your calculation of 4,000 feet differs from Mr. Brandes at 4,700 feet. Did you understand his calculation was at 4,700 feet?

A No, sir, I did not.

Q I see. Now, is it your testimony that Sun's casing program is improperly designed in the "N" 2 Well?

A No, sir.

Q I believe you made the statement "this indicated an extremely lightweight pipe." You didn't mean to imply that this was not in accord with current API standards, did you?

A Each company has its own policy of running design

casing.

Q Yes, sir. Do you think that there is any necessity for a company to over-design their casing program in order to account for possible future disposal into a formation by adjacent operators?

A No, sir.

MR. DUTTON: Thank you. That's all I have.

MR. PORTER: No further questions, the witness may be excused.

Does anyone else desire to present testimony in this case? Any statements or comments on it? The Commission will take the case under advisement and proceed to Case 4257.

I N D E X


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STATE OF NEW MEXICO )  
 ) ss  
COUNTY OF BERNALILLO )

I, GLENDA BURKS, Court Reporter 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.

  
\_\_\_\_\_  
Notary Public

My Commission Expires:

March 12, 1973



## OIL CONSERVATION COMMISSION

STATE OF NEW MEXICO

P. O. BOX 2088 - SANTA FE

87501

November 24, 1969

GOVERNOR  
DAVID F. CARGO  
CHAIRMAN

LAND COMMISSIONER  
ALEX J. ARMijo  
MEMBER

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

Mr. Clarence Hinkle  
Hinkle, Bondurant & Christy  
Attorneys at Law  
Post Office Box 10  
Roswell, New Mexico 88201

Re: Case No. 4256  
Order No. R-3882  
Applicant:  
Southwestern Natural Gas, Inc.

Dear Sir:

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

Very truly yours,

A. L. PORTER, Jr.  
Secretary-Director

ALP/ir

Copy of order also sent to:

Hobbs OCC x

Artesia OCC

Aztec OCC

Other Mr. Granville Dutton, Sun Oil Company, Dallas, Texas  
and 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. 4256  
Order No. R-3882

APPLICATION OF SOUTHWESTERN NATURAL  
GAS, INC., FOR A DUAL COMPLETION AND  
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 November 19, 1969, at Roswell, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this 24th day of November, 1969, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, 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, Southwestern Natural Gas, Inc., seeks authority to complete its T. P. State "4" Well No. 1, located in Unit O of Section 4, Township 11 South, Range 34 East, NMPM, Inbe Permo-Pennsylvanian Pool, Lea County, New Mexico, as a dual completion to produce oil from the Inbe Permo-Pennsylvanian Pool through 2 3/8-inch tubing and to dispose of produced salt water down the annulus between the 8 5/8-inch intermediate casing string and the 4 1/2-inch production casing string into the San Andres, Glorieta, Tubb, and Abo formations in the open-hole interval from approximately 4150 feet to 8500 feet.

(3) That there is no cement behind the 4 1/2-inch production casing from 8500 feet to the bottom of the 8 5/8-inch intermediate casing at 4150 feet in the subject well.



-2-

CASE No. 4256  
Order No. R-3882

(4) That there are a number of wells in the vicinity of the subject well that have essentially the same uncemented interval behind the production string.

(5) That disposal into the interval as proposed by the applicant may increase the pressure in the subject disposal zone to such an extent as to cause the collapse of casing in the applicant's well and/or other wells in the vicinity.

(6) That the subject application should be denied.

IT IS THEREFORE ORDERED:

(1) That the subject application is hereby denied.


(2) 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

  
ALEX J. ARMIJO, Member

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

  
ear/

DOCKET: REGULAR HEARING - WEDNESDAY - NOVEMBER 19, 1969

OIL CONSERVATION COMMISSION - 9 A.M. - ROSWELL INN, 1815 NORTH MAIN  
ROSWELL, NEW MEXICO

- ALLOWABLE: (1) Consideration of the oil allowable for December, 1969.
- (2) Consideration of the allowable production of gas for December, 1969, from fifteen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico, and also presentation of purchaser's nominations for said pools for the six-month period beginning January 1, 1970. Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for December, 1969.

CASE 4252: The application of the Oil Conservation Commission upon its own motion for an order granting an exception to the ninth paragraph of Chapter II, Section 2 of Order No. R-333-F to permit shutting in gas wells for the required shut-in test at some period during the 1970 test season other than immediately following the 7-day deliverability flow test; further to permit measuring the shut-in test pressure during the 8th to 15th day of shut-in of the well rather than on the 8th day as presently required. The above exceptions would be for the 1970 annual deliverability test season only and would be applicable to all wells in San Juan, Rio Arriba, McKinley, and Sandoval Counties, New Mexico, subject to the testing requirements of Chapter II of Order No. R-333-F.

CASE 4253: Application of Rice Engineering & Operating, Inc. for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the San Andres and Paddock formations in the perforated interval from 5030 feet to 6995 feet in its Vacuum SWD Well No. H-35, located in Unit H of Section 35, Township 17 South, Range 35 East, Vacuum Field, Lea County, New Mexico.

CASE 4254: Application of Kincaid & Watson Drilling Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the East Red Lake Unit Area comprising 518 acres, more or less, of State lands in Sections 35 and 36 of Township 16 South, Range 28 East and Sections 1 and 2 of Township 17 South, Range 28 East, East Red Lake Queen-Grayburg Pool, Eddy County, New Mexico.

CASE 4255: Application of Kincaid & Watson Drilling Company for a water-flood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a water-flood project in the East Red Lake Unit Area by the injection of water into the Penrose sand of the Queen formation through 4 wells located in Section 36, Township 16 South, Range 28 East and Sections 1 and 2, Township 17 South, Range 28 East, East Red Lake Queen-Grayburg Pool, Eddy County, New Mexico.

CASE 4256: Application of Southwestern Natural Gas, Inc. for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its T. P. State "4" Well No. 1 located in Unit O of Section 4, Township 11 South, Range 34 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Inbe Permo-Pennsylvanian Pool and the disposal of produced salt water through the intermediate-production casing annulus into the San Andres, Glorieta, Tubb, and Abo formations in the open-hole interval from 4150 feet to 8500 feet.

CASE 4257: Application of Sohio Petroleum Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the San Andres formation in the open-hole interval from 4920 feet to 4995 feet in its Phillips Lea SWD Well No. 4 located in Unit M of Section 31, Township 17 South, Range 34 East, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico.

CASE 4258: Southeastern nomenclature case calling for an order for the creation and extension of certain pools in Lea, Chaves, and Eddy Counties, New Mexico.

(a) Create a new pool in Lea County, New Mexico, classified as an oil pool for Montoya production and designated as the Loop 18-Montoya Pool. The discovery well is the Gulf Oil Corporation Harry Leonard NCT-E No. 5 located in Unit H of Section 16, Township 21 South, Range 37 East, NMPM. Said pool would comprise:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM  
SECTION 16: NE/4

(b) Extend the North Baum-Upper Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 13 SOUTH, RANGE 32 EAST, NMPM  
SECTION 26: NW/4

(c) Extend the Double L-Queen Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 29 EAST, NMPM  
SECTION 36: SE/4 SE/4

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM  
SECTION 1: E/2 E/2

TOWNSHIP 15 SOUTH, RANGE 30 EAST, NMPM  
SECTION 6: SW/4

(d) Extend the Hardy-Blinebry Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 36 EAST, NMPM  
SECTION 2: Lots 9, 10, 15 and 16

(e) Extend the Hobbs-Drinkard Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 38 EAST, NMPM  
SECTION 28: SW/4  
SECTION 30: NE/4

(f) Extend the Lea-Pennsylvanian Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 34 EAST, NMPM  
SECTION 14: NE/4

(g) Extend the West Sawyer-San Andres Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 9 SOUTH, RANGE 37 EAST, NMPM  
SECTION 33: SE/4 and E/2 SW/4

(h) Extend the Shugart Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 30 EAST, NMPM  
SECTION 25: E/2 NW/4

(i) Extend the Spencer-San Andres Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 36 EAST, NMPM  
SECTION 24: N/2 SW/4

(j) Extend the Sulimar-Queen Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM  
SECTION 25: NW/4 NW/4

(k) Extend the Tulk-Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 32 EAST, NMPM  
SECTION 35: NW/4



TENNECO OIL COMPANY • P. O. BOX 1031 • 1800 WILCO BUILDING • MIDLAND, TEXAS 79701

November 19, 1969

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

Re: Case #4256  
Application for Salt Water Disposal  
Inbe Permo Penn Pool

Gentlemen:

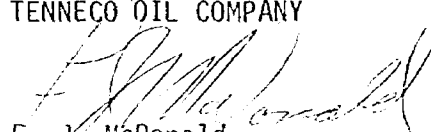
Southwestern Natural Gas, Inc. in the subject case has filed application for salt water disposal in the open hole interval 4150-8500' through the intermediate-production casing annulus. This disposal is to be at their T. P. State "4" Well No. 1 located in Unit 0, Section 4, T-11-S, R-34-E, Lea County, New Mexico. Tenneco Oil Company must object to this disposal method.

Tenneco operates two leases, our State EF Unit covering parts of Section 5 and all of Section 6, T-11-S, R-34-E and our State Tract 4303 covering the NW/4 of Section 35, T-10-S, R-33-E, within two miles of the proposed disposal well. Several years ago casing collapsed on our State Tract 4303 Well No. 2 located in Unit "F" of Section 35, T-10-S, R-33-E. This well was replaced by our Well No. 2-Y located in Unit "D". Recently we have evidence that casing has collapsed in State Tract 4303 Well No. 1 located in Unit "C" of Section 35.

We believe that disposal of produced water into the requested interval may well contribute to increased casing pressure in the area. Increases in casing pressure could jeopardize additional wells through casing collapse. Inasmuch as alternate disposal methods are available, such as the Rice operated South Lane Salt Water Disposal System, which could eliminate possible operating hazards we recommend that the application be denied.

Yours very truly,

TENNECO OIL COMPANY

  
F. J. McDonald  
District Production Superintendent

JFC:gs

cc: New Mexico Oil Conservation Commission  
Attention: Mr. Joe Ramey  
P. O. Box 1980  
Hobbs, New Mexico 88240

Southwestern Natural Gas, Inc.  
900 Building of Southwest  
Midland, Texas 79701

NOV 6 RECD

November 4, 1969

*Must file - Case 4.2.56*

Southwestern Natural Gas, Inc.  
900 Building of the Southwest  
Midland, Texas 79701

Attn: Mr. Don C. Bennett

Re: Southwestern Natural Gas, Inc. - T. P.  
State "4", Well No. 1, Inbe Penn Field,  
Section 4, T-11-S, R-34-E,  
Lea County, New Mexico

Gentlemen:

We have a copy of your application to the State of New Mexico for permission to operate an annular disposal system in your T. P. State "4", Well No. 1, Inbe Field, Lea County, New Mexico.

Sun Oil Company objects to your proposal to inject in the subject well from 4150' to 8500' for the following reasons:

- (1) The San Andres, Glorieta, Tubb and Abo formations will be open to receive fluid.
- (2) Sun wells in Sections 4 and 9 have no cement behind the pipe from our 8-5/8 casing seat to approximately 8700' and when your injection pressures reached our wells it would be conducive to casing collapse.

Because of our feeling that your proposal could be the cause of numerous expensive workovers in this area, we feel we must object to your request.

Yours very truly,

SUN OIL COMPANY

*A. R. Ballou*  
A. R. Ballou

DO NOT MAIL  
Date 11-7-69

ARB:dd

cc: New Mexico Oil Conservation Commission, Santa Fe, New Mexico ✓  
Bogle Farms, Inc., Dexter, New Mexico  
Major, Glebel & Forster, Midland, Texas

5 in making 7 to 10 bbls of wt  
per day through the  $5 \times 8 \frac{5}{8}$  annulus

2400 psi collapse calculated strength  
(c) ~~4700~~ 4700 (in SA) calc that w/  
400 psi there would be 2500  
psi hydrostatic head (14 lb/csq  
opposite SA)

1300



Mr. George Hatch, Counsel  
Oil Conservation Commission  
Santa Fe, New Mexico

Dr. Mr. Hatch:

I wish to enter an appearance in Case  
No. 4256, the application of Southwestern Natural  
Gas, Inc., in association with Mr. Ironville Dutton,  
a member of the Texas Bar, who will present the  
case.

Yours very truly  
Jason W. Kellakin

Kellakin & Fox  
P. O. Box 1769  
Santa Fe, New Mexico

SOUTHWESTERN NATURAL GAS, INC.

900 BUILDING OF THE SOUTHWEST  
MIDLAND, TEXAS 79701

L. N. DUNNAVANT  
VICE PRESIDENT AND  
MANAGER OF OPERATIONS

October 27, 1969

Bogle Farms, Inc.  
c/o Hal Bogle  
Dexter, New Mexico

Sun Oil Company  
P. O. Box 1861  
Midland, Texas  
79701

*Encl 4256*  
Major, Giebel &  
Forster  
1126 Vaughn Bldg.  
Midland, Texas 79701

RE: Salt Water Disposal Application  
T. P. State "4", Well No. 1,  
Inbe Field, Lea County, New  
Mexico.

Gentlemen:

Southwestern Natural Gas, Inc. has made application to the State of New Mexico for permission to operate an annular disposal system in the subject well.

Attached for your information is a copy of the application (Form C-108), a copy of the letter to the New Mexico Oil Conservation Commission, and a copy of the diagrammatical sketch of the proposed system.

If you have no objections to the installation and operation of the proposed system, please execute two (2) copies of this letter, and mail one (1) copy to the New Mexico Oil Conservation Commission in Santa Fe and return one (1) copy to Southwestern Natural Gas, Inc. - 900 Building of the Southwest - Midland, Texas 79701.

Stamped, addressed envelopes are enclosed for your convenience.

Very truly yours,

Approved \_\_\_\_\_

Company \_\_\_\_\_

By \_\_\_\_\_

Date \_\_\_\_\_

SOUTHWESTERN NATURAL GAS, INC.

*Don C. Bennett*

Don C. Bennett  
Operations Manager

DCB/lh

Attachments

SOUTHWESTERN NATURAL GAS, INC.

900 BUILDING OF THE SOUTHWEST  
MIDLAND, TEXAS 79701

OCT 30 1969

L. N. DUNNAVANT  
VICE PRESIDENT AND  
MANAGER OF OPERATIONS

October 27, 1969

Bogle Farms, Inc.  
c/o Hal Bogle  
Dexter, New Mexico

Sun Oil Company  
P. O. Box 1861  
Midland, Texas  
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Forster  
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RE: Salt Water Disposal Application  
T. P. State "4", Well No. 1,  
Inbe Field, Lea County, New  
Mexico.

Case  
4256

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Stamped, addressed envelopes are enclosed for your convenience.

Very truly yours,

Approved [Signature]

SOUTHWESTERN NATURAL GAS, INC.

Company [Signature]

By [Signature]

Date [Signature]

[Signature]

Don C. Bennett

Operations Manager

DCB/lh

Attachments

RECEIVED

MIDLAND, TEXAS

OCT 28 1969

APPROVED

Docket No. 31-69

DOCKET: REGULAR HEARING - WEDNESDAY - NOVEMBER 19, 1969

OIL CONSERVATION COMMISSION - 9 A.M. - ROSWELL INN, 1815 NORTH MAIN  
ROSWELL, NEW MEXICO

---

- ALLOWABLE: (1) Consideration of the oil allowable for December, 1969.
- (2) Consideration of the allowable production of gas for December, 1969, from fifteen prorated pools in Lea, Eddy, Roosevelt and Chaves Counties, New Mexico, and also presentation of purchaser's nominations for said pools for the six-month period beginning January 1, 1970. Consideration of the allowable production of gas from nine prorated pools in San Juan, Rio Arriba and Sandoval Counties, New Mexico, for December, 1969.
- CASE 4252: The application of the Oil Conservation Commission upon its own motion for an order granting an exception to the ninth paragraph of Chapter II, Section 2 of Order No. R-333-F to permit shutting in gas wells for the required shut-in test at some period during the 1970 test season other than immediately following the 7-day deliverability flow test; further to permit measuring the shut-in test pressure during the 8th to 15th day of shut-in of the well rather than on the 8th day as presently required. The above exceptions would be for the 1970 annual deliverability test season only and would be applicable to all wells in San Juan, Rio Arriba, McKinley, and Sandoval Counties, New Mexico, subject to the testing requirements of Chapter II of Order No. R-333-F.
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- CASE 4254: Application of Kincaid & Watson Drilling Company for a unit agreement, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks approval of the East Red Lake Unit Area comprising 518 acres, more or less, of State lands in Sections 35 and 36 of Township 16 South, Range 28 East and Sections 1 and 2 of Township 17 South, Range 28 East, East Red Lake Queen-Grayburg Pool, Eddy County, New Mexico.

- CASE 4255: Application of Kincaid & Watson Drilling Company for a water-flood project, Eddy County, New Mexico. Applicant, in the above-styled cause, seeks authority to institute a water-flood project in the East Red Lake Unit Area by the injection of water into the Penrose sand of the Queen formation through 4 wells located in Section 36, Township 16 South, Range 28 East and Sections 1 and 2, Township 17 South, Range 28 East, East Red Lake Queen-Grayburg Pool, Eddy County, New Mexico.
- CASE 4256: Application of Southwestern Natural Gas, Inc. for a dual completion and salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dually complete its T. P. State "4" Well No. 1 located in Unit O of Section 4, Township 11 South, Range 34 East, Lea County, New Mexico, in such a manner as to permit the production of oil from the Inbe Permo-Pennsylvanian Pool and the disposal of produced salt water through the intermediate-production casing annulus into the San Andres, Glorieta, Tubb, and Abo formations in the open-hole interval from 4150 feet to 8500 feet.
- CASE 4257: Application of Sohio Petroleum Company for salt water disposal, Lea County, New Mexico. Applicant, in the above-styled cause, seeks authority to dispose of produced salt water into the San Andres formation in the open-hole interval from 4920 feet to 4995 feet in its Phillips Lea SWD Well No. 4 located in Unit M of Section 31, Township 17 South, Range 34 East, Vacuum Grayburg-San Andres Pool, Lea County, New Mexico.
- CASE 4258: Southeastern nomenclature case calling for an order for the creation and extension of certain pools in Lea, Chaves and Eddy Counties, New Mexico.
- (a) Create a new pool in Lea County, New Mexico, classified as an oil pool for Montoya production and designated as the Loop 18-Montoya Pool. The discovery well is the Gulf Oil Corporation Harry Leonard NCT-E No. 5 located in Unit H of Section 16, Township 21 South, Range 37 East, NMPM. Said pool would comprise:

TOWNSHIP 21 SOUTH, RANGE 37 EAST, NMPM  
SECTION 16: NE/4

(b) Extend the North Baum-Upper Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 13 SOUTH, RANGE 32 EAST, NMPM  
SECTION 26: NW/4

(c) Extend the Double L-Queen Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 29 EAST, NMPM  
SECTION 36: SE/4 SE/4

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM  
SECTION 1: E/2 E/2

TOWNSHIP 15 SOUTH, RANGE 30 EAST, NMPM  
SECTION 6: SW/4

(d) Extend the Hardy-Blinbry Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 21 SOUTH, RANGE 36 EAST, NMPM  
SECTION 2: Lots 9, 10, 15 and 16

(e) Extend the Hobbs-Drinkard Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 38 EAST, NMPM  
SECTION 28: SW/4  
SECTION 30: NE/4

(f) Extend the Lea-Pennsylvanian Gas Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 20 SOUTH, RANGE 34 EAST, NMPM  
SECTION 14: NE/4

(g) Extend the West Sawyer-San Andres Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 9 SOUTH, RANGE 37 EAST, NMPM  
SECTION 33: SE/4 and E/2 SW/4

(h) Extend the Shugart Pool in Eddy County, New Mexico, to include therein:

TOWNSHIP 18 SOUTH, RANGE 30 EAST, NMPM  
SECTION 25: E/2 NW/4

November 19, 1969 - Regular Hearing  
Page 4

Docket No. 31-69

(i) Extend the Spencer-San Andŕes Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 17 SOUTH, RANGE 36 EAST, NMPM  
SECTION 24: N/2 SW/4

(j) Extend the Sulimar-Queen Pool in Chaves County, New Mexico, to include therein:

TOWNSHIP 15 SOUTH, RANGE 29 EAST, NMPM  
SECTION 25: NW/4 NW/4

(k) Extend the Tulk-Pennsylvanian Pool in Lea County, New Mexico, to include therein:

TOWNSHIP 14 SOUTH, RANGE 32 EAST, NMPM  
SECTION 35: NW/4

31	32	33	34	35	36	37	38	39	40
31	32	33	34	35	36	37	38	39	40
31	32	33	34	35	36	37	38	39	40
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31	32	33	34	35	36	37	38	39	40
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# BAGLEY, N.E.

31	32	33	34	35	36	37	38	39	40
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31	32	33	34	35	36	37	38	39	40

## OIL CONSERVATION COMMISSION

Santa Fe, New Mexico

Exhibit No. 256

Case No. 256

SOUTHWESTERN NATURAL GAS, INC.

T. P. STATE "4" NO. 1

INBE FIELD LEA COUNTY, NEW MEXICO



**BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico**

App. Exhibit No. 2  
Case No. 4256

Proposed Annular Injection Zone  
4150' - 8-5/8" Csg. Shoe  
to 8500' - Top of Cement  
in 4-1/2" - 7-7/8" Annulus

Formations Open  
San Andres - 4040'  
Glorieta - 5480'  
Tubb - 6935'  
Abo - 7772'

Southwestern Natural Gas, Inc.  
T.P. STATE "4" NO. 1  
Inbe Field  
Lea County, New Mexico

Water Injection

Oil Production

13-3/8" Csg.  
Set @ 360' Cmtd.  
with 350 sks. Cmt.  
Circulated 17-1/2"  
Hole

Top Cmt. @ 2300'

Csg. set @ 4150'  
Cmtd. with 400 sks.  
11" Hole

4,350' OH

#2

Top Cmt. @ 8500'

2-3/8" Tbg. set @ 9603'

Top: 9972'

Producing Zone  
Btm: 9978'

P.B.T. D. - 9985'

Cmtd. with 400 sks.

4-1/2" Csg. set @ 10,013'  
7-7/8" Hole

District: \_\_\_\_\_

**GEOLOGICAL AND CHEMICAL LABORATORIES**

BEFORE THE  
OIL CONSERVATION COMMISSION  
Santa Fe, New Mexico  
App. .... Exhibit No. 4  
Case No. 4256

SOUTHWESTERN NATURAL GAS, INC.

900 BUILDING OF THE SOUTHWEST  
MIDLAND, TEXAS 79701

L. N. DUNNAVANT  
VICE PRESIDENT AND  
MANAGER OF OPERATIONS

October 27, 1969

OCT 28 1969

Case 4256

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

RE: Salt Water Disposal Application  
T. P. State "4", Well No. 1,  
Inbe Field, Lea County, New  
Mexico.

Gentlemen:

Attached is Southwestern Natural Gas, Inc.'s application for annular type disposal of produced water for the subject well.

Also attached are a plat of the area, indicating the subject well, a diagramatical sketch of the subject well, and an electrical log with the producing zone and proposed disposal intervals marked on the detailed section. Copies of the subject application have been sent to the surface owner and to both offset operators. Also attached is a copy of the waiver letter sent to the surface owner and both offset operators.

We would appreciate consideration of this application at your earliest convenience.

Yours very truly,

SOUTHWESTERN NATURAL GAS, INC.

*Don C. Bennett*

Don C. Bennett  
Operations Manager

DCB/lh

Attachments

DOCKET MAILED

Date 11-7-69

Form C-408  
Revised 1-1-65

NEW MEXICO OIL CONSERVATION COMMISSION

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

OCT 28 1969

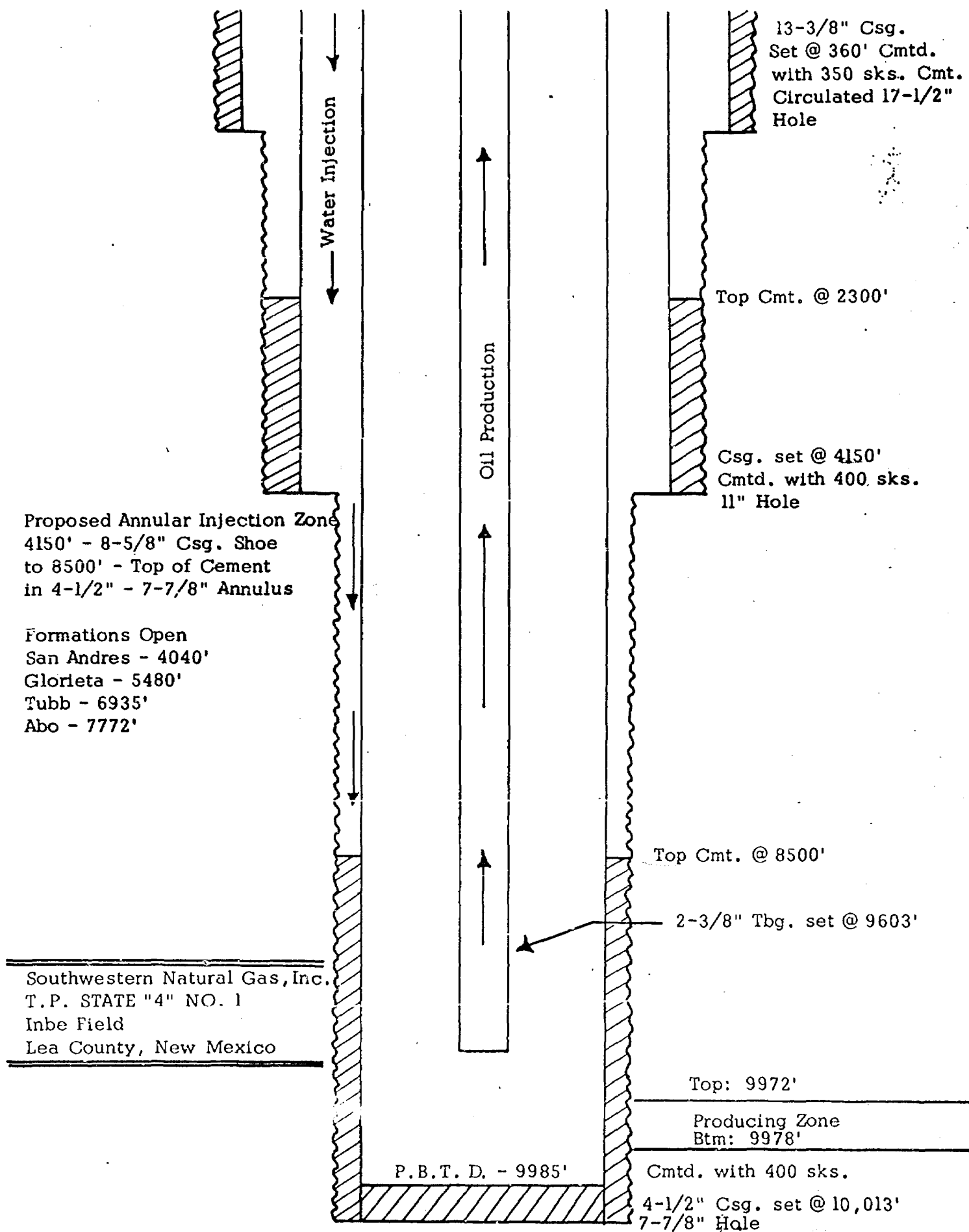
OPERATOR <b>Southwestern Natural Gas, Inc.</b>		ADDRESS <b>900 Building of the Southwest</b>	
LEASE NAME <b>T P State "4"</b>	WELL NO. <b>1</b>	FIELD <b>Inbe</b>	COUNTY <b>Lea</b>
LOCATION UNIT LETTER <b>O</b> ; WELL IS LOCATED <b>660</b> FEET FROM THE <b>South</b> LINE AND <b>2100</b> FEET FROM THE <b>East</b> LINE, SECTION <b>4</b> TOWNSHIP <b>11 S</b> RANGE <b>34 E</b> NMPM.			
CASING AND TUBING DATA			
NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT
SURFACE CASING	13-3/8"	360'	350
INTERMEDIATE	8-5/8"	4150'	400
LONG STRING	4-1/2"	10,013'	400
TUBING	2-3/8"	9603'	NAME, MODEL AND DEPTH OF TUBING PACKER <b>None</b>
NAME OF PROPOSED INJECTION FORMATION		TOP OF FORMATION	BOTTOM OF FORMATION
<b>Zones from 4150' to 8500' (See Attached Sketch)</b>		<b>4150'</b>	<b>8500'</b>
IS INJECTION THROUGH TUBING, CASING, OR ANNULUS?		PERFORATIONS OR OPEN HOLE?	PROPOSED INTERVAL(S) OF INJECTION
<b>Annulus</b>		<b>Open Hole</b>	<b>4150' - 8500'</b>
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?
<b>No</b>	<b>Oil Production</b>		<b>Yes</b>
LIST ALL SUCH PERFORATED INTERVALS AND SACKS OF CEMENT USED TO SEAL OFF OR SQUEEZE EACH			
<b>9972' - 9978' - Producing Perforations</b>			
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
<b>300'</b>	<b>None</b>		<b>9972'</b>
ANTICIPATED DAILY INJECTION VOLUME (BBLs.)	MINIMUM	MAXIMUM	OPEN OR CLOSED TYPE SYSTEM
	<b>150</b>	<b>600</b>	<b>Closed</b>
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 -		IS INJECTION TO BE BY GRAVITY OR PRESSURE?	APPROX. PRESSURE (PSI)
		<b>Pressure</b>	<b>400</b>
WATER TO BE DISPOSED OF		NATURAL WATER IN DISPOSAL ZONE	ARE WATER ANALYSES ATTACHED?
<b>Yes</b>		<b>Yes</b>	<b>Yes (Wtr to be disposed)</b>
NAME AND ADDRESS OF SURFACE OWNER (OR LESSEE, IF STATE OR FEDERAL LAND)			
<b>Bogle Farms, Inc. c/o Hal Bogle, Dexter, New Mexico</b>			
LIST NAMES AND ADDRESSES OF ALL OPERATORS WITHIN ONE-HALF (1/2) MILE OF THIS INJECTION WELL			
<b>Sun Oil Company, P.O. Box 1961 - Midland, Texas 79701</b>			
<b>Major, Giebel &amp; Forster, 1126 Vaughn Bldg. - Midland, Texas 79701</b>			
HAVE COPIES OF THIS APPLICATION BEEN SENT TO EACH OF THE FOLLOWING?	SURFACE OWNER		EACH OPERATOR WITHIN ONE-HALF MILE OF THIS WELL
	<b>Yes</b>		<b>Yes</b>
ARE THE FOLLOWING ITEMS ATTACHED TO THIS APPLICATION (SEE RULE 701-B)	PLAT OF AREA		ELECTRICAL LOG
	<b>Yes</b>		<b>Yes</b>
		THE NEW MEXICO STATE ENGINEER	
		<b>NA</b>	
		DIAGRAMMATIC SKETCH OF WELL	
		<b>Yes</b>	

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

*Don C. Burnett* Operations Manager October 27, 1969  
(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.

Case 4256





DRAFT

GMH/esr

11-20-69

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. 4256

Order No. R- 3882

APPLICATION OF SOUTHWESTERN NATURAL  
GAS, INC., FOR A DUAL COMPLETION AND  
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 November 19, 1969, at Roswell, New Mexico, before the Oil Conservation Commission of New Mexico, hereinafter referred to as the "Commission."

NOW, on this \_\_\_\_\_ day of November, 1969, the Commission, a quorum being present, having considered the testimony presented and the exhibits received at said hearing, and being fully advised in the premises,

(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, Southwestern Natural Gas, Inc., seeks authority to complete its T. P. State "4" Well No. 1, located in Unit O of Section 4, Township 11 South, Range 34 East, NMPM, Inbe Permo-Pennsylvanian Pool, Lea County, New Mexico, as a dual completion to produce oil from the Inbe Permo-Pennsylvanian Pool through 2 3/8-inch tubing and to dispose of produced salt water down the annulus between the 8 5/8-inch intermediate casing string and the 4 1/2-inch production casing string into the San Andres, Glorieta, Tubb, and Abo formations in the open-hole interval from approximately 4150 feet to 8500 feet.

(3) That there is no cement behind the 4 1/2-inch production casing from 8500 feet to the bottom of the 8 5/8-inch intermediate casing at 4150 feet in the subject well.

(4) That there are a number of wells in the vicinity of the subject well that have essentially the same <sup>uncemented interval</sup> ~~same~~ behind the production string, ~~that has not been cemented as the subject well~~  
~~the same described in the subject well~~

(5) That disposal into the interval as proposed by the applicant may increase the pressure in the subject disposal zone to such an extent as to cause the collapse of casing in ~~either~~ the applicant's well and/or other wells in the vicinity.

(6) That the subject application should be denied.

IT IS THEREFORE ORDERED:

- (1) That the subject application is hereby denied.
- (2) 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.