BEFORE THE
OIL CONSERVATION COMMISSION
Santa Fe, New Mexico
December 12, 1961

EXAMINER HEARING

IN THE MATTER OF:
Application of Socony Mobil Oil Company, Inc., for an exception to Rule 303 (a), Lea County, New Mexico. Applicant, in the above-styled cause, seeks an exception to Rule 303 (a) to permit the commingling of the production from the Denton-Devonian and the Denton-Wolfcamp Pools on its T. D. Pope lease, comprising the S/2 of Section 26 and the W/2 of Section 36, Township 14 South, Range 37 East, Lea County, New Mexico. Applicant proposes to meter the production from one pool only and to allocate production to the other pool according to the subtraction method; the API gravity of the crude from one of the pools is greater than 45°.

CASE NO. 2454

BEFORE: Elvis A. Utz, Examiner

TRANSCRIPT OF HEARING

EXAMINER UTZ: We will take next case, 2454.

MR. WHITFIELD: Case 2454: Application of Socony Mobil Oil Company, Inc., for an exception to Rule 303 (a), Lea County, New Mexico.

MR. ERREBO: I'm Burns Errebo with Modrall, Seymour, Sperling, Roehl and Harris of Albuquerque, appearing on behalf of the applicant. We will have one witness.

MR. UTZ: Any other appearances in this case? You may

swear the witness.

(Witness sworn.)

(Whereupon, Applicant's Exhibit No. 1 marked for identification.)

JAMES M. McGEE,

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

DIRECT EXAMINATION

BY MR. ERREBO:

Q State your name, please.

A James M. McGee.

Q Will you state by whom you are employed, at what location, and in what capacity?

A I'm employed by Mobil Oil Company, Socony Mobil Oil Company, Inc., in Hobbs, New Mexico, as production engineer.

Q Have you previously testified before this Commission as an engineer and were your qualifications accepted?

A Yes.

MR. ERREBO: Mr. Morris, I note in the application that there is a change that should be made in the description. The proper description of the lease as covered by this application, which is a T. D. Pope lease, is the South Half of Section 26 and the East Half of Section 35, Township 14 South, Range 37 East, Lea County, New Mexico. The application reads: The West Half of Section 36. I wonder if we can make that amend-

ment at this time?

MR. MORRIS: Off the record.

(Discussion off the record.)

MR. MORRIS: Back on the record.

MR. ERREBO: Mr. Examiner, we move to amend the application to cover the following described acreage: South Half of Section 26, and the East Half of Section 35, Township 14 South, Range 37 East, Lea County, New Mexico.

MR. UTZ: Mr. Morris:

MR. MORRIS: If the Examiner please, I would concur in Mr. Errebo's motion for amendment of the application in this case, provided that Socony Mobil furnish to the Commission waivers of objection from all offset operators to the East Half of Section 35 that has been added to the application and all operators within Section 35. In other words, that would include Sinclair, Shell, Skelly, Atlantic, Phillips, and I believe that's all. Would Socony Mobil be willing to secure the waivers of objection from offsetting operators?

MR. ERREBO: We'll be glad to and we'll furnish them to the Commission.

MR. MORRIS: I would recommend to the Examiner that the case proceed on that basis.

MR. UTZ: The application will be amended subject to those provisions just stated.

Q (By Mr. Errebo) Mr. McGee, have you prepared a plat

showing the T. D. Pope lease which is the subject of this application?

A Yes, sir, I have. It is Exhibit 1.

Q Will you refer to that exhibit, please, and describe what is shown thereon?

A Exhibit 1 shows the location of all the wells on our T. D. Pope lease, which is indicated in the pink. This in our color code for our company indicates a part interest lease. This lease has some 31 wells on it, 16 Devonian Wells, and 30 Wolfcamp Wells.

Q Is there anything else further you have with regard to that exhibit?

A No.

(Whereupon, Applicant's Exhibit No. 2 marked for identification.)

Q Will you refer to Exhibit No. 2 and state what is shown thereon?

A Exhibit 2 is another map of the Pope lease. It shows our proposed satellite locations which are at the standard battery locations now.

Q What do you mean by satellite locations?

A This would be the point at which we propose to commingle the Wolfcamp and Devonian fluids and place them in a common gathering line consisting of four-inch and six-inch line to be transported to the central battery site.

Q Will you refer to your Exhibit 2-B.

A This exhibit shows the gravities and value of the production on the Pope lease in any one month. This month was picked at randon, and it shows that the gravity being above the 44 which is the penalty point in our gravity there on sales price. Both these crudes would have, after they are commingled, more value than before they're commingled.

Q That shows a total value to be in excess of the individual values of the liquids produced, is that correct?

A That's correct.

Q Will you refer to the next exhibit which I believe you have marked Exhibit No. 3, however, that is actually No. 4, is it not?

A That's correct. You will notice that I have marked there in pencil, I have made a mistake on this, we should have our metering on the Devonian side as indicated originally. If these pencil marks are taken out, that will be correct because that's the low gravity side. According to the rules it should be the one that's metered and sampled. This is a diagramatic sketch of our proposed commingling system. In each one of our satellites, which this would be a satellite, there's a header for each zone and we propose to commingle through a three-way, three position pneumatically operated valve on test into a test heater treater and then meter. Otherwise we will go

through the production separators and through a metering facility and sampling facility on the Devonian side, since the Devonian does produce water. We propose to meter the Devonian and then utilize the subtraction method to determine the production through the Wolfcamp side.

MR. UTZ: Is that the correction that you made on this Exhibit No. 3 here?

A Yes, sir, it should be erased.

MR. UTZ: Then you were right in the first place?

A Yes, sir.

Q (By Mr. Errebo) Do you have anything further with regard to Exhibit No. 3, Mr. McGee?

A No, I don't.

Q Will you refer to your next exhibit then and identify it?

A Exhibit 4 shows the average daily production for the months of September and October, which is approximately 60 days, and shows that our Denton side is predominantly top allowable wells while the Wolfcamp side is all marginal wells, and this is additional information. Attached to this are copies of C-115's for the months of September and October. It's also to be noted that on the C-115's that the Wolfcamp makes very little water; in fact, only one well which is No. 11 which makes approximately, oh, seven or eight per cent water. The other Wolfcamp wells on this lease make no water or none that can be measured.

Q What is the total average daily production for the Devonian formation as shown on this exhibit?

A Devonian formation would be 2624 barrels a day.

Q What is the comparable production for the Wolfcamp?

A Would be 349 barrels per day.

Q Which of those formations do you propose to meter, and which do you propose to determine production from by the subtraction method?

A We propose to meter the Denton Pool production and determine the Wolfcamp production by the subtraction method.

Q Which is the water-producing zone of the two?

A The Denton is predominantly the water production zone.

Q The Devonian, you mean?

A The Denton-Devonian, right.

Q Then you propose to meter it?

A That's correct, and sample.

Q Do you have anything further with regard to that exhibit?

A No, but at this point I would like to say that through studying pressure volume and temperature analysis on these two crudes, we have established that a reduction in pressure since our separators operated, from 50 to 60 pounds PSI per vessel. We've established through P.C.T. analysis that a reduction from 100 to zero, these two crudes shrinking almost identically, the difference being 1/10,000th in the volume formation factor. We

would like to prove our meter on the Denton side, not taking into account weathering, since we believe that the weathering would also be identical on the two crudes. What we would like to do is prove our meter on the Devonian side under pressure with a master meter and collect samples of the Devonian crude periodically, preferably to us annually; however, what the Commission would say in this instance would be agreeable to us. Collect this fluid under 60 pounds, flash it to zero PSI; determine a shrinkage factor which would be applied to our meter factor, and thereby allow us to prove these meters under the pressure, under the same conditions that it's metered through the meter. We estimate that the reduction would be approximately five to ten per cent in volume. So we would periodically run pressure and volume analyses on the crude and flash it from 60 PSI to zero PSI and get the shrinkage factor which would be applied to the meter factor. This keeps us from having to prove into a positive volume atmospheric tank. One reason we would like to use this method is because we have to dump against 25 pounds into this gathering system. In order for us to get this atmospheric prover back in there, we would have to haul the oil down to the battery and dump it into the tanks or have a pump to pump it back into the line.

Q Do you anticipate that should the Commission allow you to use this procedure, that you would save substantial investment cost in lease equipment?

A Yes, we would. A positive volume prover would cost approximately $1500, maybe more than that, probably more having to be trailer mounted so we could haul it around. Through PCT analysis on this crude we can establish and hold this correction shrinkage factor. I think it would average out about the same, I think, from year to year on this high gravity crude.

Q What was the actual difference in formation volume factor on the Wolfcamp crude which you referred to a while ago?

A On the Wolfcamp crude at 100 PSI and 140 degrees Fahrenheit the formation volume factor was 1.1571.

MR. UTZ: Which crude was that?

A The Wolfcamp.

MR. UTZ: 1.1571?

A 1.1571. At zero PSI and 140 degrees Fahrenheit, the formation factor was 1.0412, the difference being 0.1159. Now on the Denton-Devonian crude at 100 PSI and 176 degrees Farenheit, the formation volume factor is 1.1991. At zero pressure and 176 degrees Fahrenheit the formation volume factor is 1.0833, the difference being 0.1158. This is what we base our assumption that any weathering in the tanks would be comparable to this. They would both weather about the same amount.

Q Do you have any reason to believe that the weathering characteristics of these liquids might be different as time passes?

A No, because on the PCT analysis, although there would

be a different temperature in the tanks, at much lower temperature I still feel it would be about the same because the basic assumption of the PCT analysis is as you reduce the pressure, you liberate gas; and so we have liberated some gas in the reservoir already, but when we take this crude as 60 PSI and bring it to zero, we would liberate approximately the same amount of gas as we have on the PCT analysis.

Q How often would you propose to take these PCT analyses?

A I would think that annually would be sufficient. There won't be that much change in crude, I don't think. In fact, I don't think it would change at all.

Q From those you would determine the factor which would be used in the meter, is that correct?

A Yes, for instance, I have estimated that there would be shrinkage from five to ten per cent, thereby we would multiply our meter factor by .9 or .95 to establish the correct meter factor.

Q Where or by the use of what facilities would these tests be run?

A We would catch this in a container that's built to catch these samples under pressure of the separator, off of each separator. What we propose to do is run a separate PCT analysis of each separator so that each meter would have a separate multiplier and we would catch them under pressure and

send them to either our lab in Dallas or a commercial lab and have these analyses run, these liberations run on them.

Q Would the report which you receive be made available to the Commission?

A Certainly.

Q Will you refer to your next exhibit, which I believe is No. 5.

A The next exhibit shows our central battery site. These four satellites will dump into a gathering system and, as indicated there in the upper left-hand corner of this exhibit, from the T. D. Pope satellites. They would come in to one large heater treater, or two medium size, through a gun barrel into our tanks. We propose to install on this an ACT unit and if we have sufficient vapors off these stock tanks, to install a vapor recovery system on them. This is just a general outline layout of this central battery.

Q Will you refer to your next exhibit?

A Exhibit No. 6.

MR. ERREBO: I believe that is exactly labeled Exhibit 5 in Roman numerals.

A Yes.

MR. ERREBO: But it is actually Exhibit 6?

A Yes. It is the general outline of the LACT unit. You will notice that we have a meter prover that's quite new in the industry. It's a cylindrical piston prover type. We propose

to prove our master meters on this since the accuracy of this prover is very good. We would prove our master meter on this prover; thereby it would be proved on almost the same gravity crude that we will prove the separator meters on.

Q Now your LACT facilities are not yet installed?

A No, and we do not propose to apply for an approval on them at the present time. We will apply for administrative approval on that.

Q Are you ready to state that your company will definitely proceed with this installation?

A Yes.

Q Do you know within what period of time?

A Immediately after we receive--in fact, we have already started some installation, not anticipating that we will get this exception but within the rules we could administratively get approval by metering both these zones, so we have already started construction and if this application is not approved we will apply administratively.

Q Do you have anything further with regard to this application?

A No, except it is our position on commingling, I would like to say Mobil's or maybe I should say my own opinion, that the fewer meters that you can put in an installation the better off you are from a maintenance standpoint, from an operating standpoint; and the whole idea to us on automation and comming-

ling is to be allowed to produce a zone to a lower economic limit, because we can cut our maintenance expenses, we can cut our operating labor, and the more cuts we can make on these two items, the longer we can produce the lease and which we feel is the only payout we can justify on it anyway.

Q Is it your testimony then that the granting of this application would result in the recovery of a greater amount of the liquid reserves in place, as well as gas reserves?

A Yes, I really do think that.

Q And that if the application is not granted there might be some loss of those otherwise recoverable liquids, is that correct?

A If we cannot get administrative approval, either, we intent to, if we can, commingle them even if we have to meter both zones because there is profit in the thing.

Q Have you checked your records to determine whether all of the ownership in the minerals under the entire lease is common?

A It is. And we've checked it through our accounting department in Dallas.

Q To your knowledge has this shrinkage factor been applied in any other instance heretofore?

A Not that I know of, but like we say, we feel that to get the best factor possible on a meter that it must be proved under the same conditions that it operates under. Therefore,

we advocate proving it with a master meter under separator pressure and applying the shrinkage factor to it.

Q Do you feel that procedure will result in the most accurate measurement of the fluids that are produced?

A I believe so. I couldn't say for sure but theoretically I would say yes.

Q What are your reservations on that?

A I would say you could put it into a positive volume atmospheric prover, but this would force us to put more investment in the lease and also require more manpower to prove the meters. There would be very little difference in applying the shrinkage factor to the meter in liberating the gas right at the meter at the time that you prove it.

MR. ERREBO: I believe that's all we have, Mr. Examiner.

CROSS EXAMINER

BY MR. UTZ:

Q Mr. McGee, on your Exhibit 2, that shows your satellite stations, is that correct?

A That's right.

Q Where is your ACT located?

A The central ACT will be located in the south, the center of the Southwest Quarter, Section 26, Township--I'm sorry, the Southeast Quarter of Section 26, Township 14 South, Range 37 East.

Q You request here an exception to the 45 degree rule, using the subtraction method, correct?

A That's right.

Q In other words, you want to determine the volume of the Wolfcamp by the subtraction method, after metering both the Devonian and the Wolfcamp and metering the Devonian separately?

A That's right.

Q Now this shrinkage deal, you are actually flowing into 25 pound back pressure?

A That's right.

Q From your Devonian side?

A That's right.

Q Then to the stock tanks, which would essentially take this fluid to zero?

A Yes, sir.

Q Now, you will have shrinkage at the stock tanks, isn't that correct?

A That's correct.

Q How will you determine what that shrinkage is?

A What we will do is have a cylinder at the separator and take a sample of the fluid in the cylinder at the separator pressure, which would be approximately 50 to 60 PSI and then we would send this cylinder to a lab and have it flashed to atmosphere and the lab will measure the shrinkage in the amount of fluid. We can obtain this in a percentage or in a factor.

Q Which shrinkage factor you will incorporate your meter correction factor?

A That's correct.

Q How often will you run this test?

A We would propose annually.

Q So that you would use that test only on the Devonian side?

A That's correct, because we feel that from the PCT analysis, both sides shrink approximately the same.

Q If you do run the test on the Wolfcamp side also, you would have a more accurate shrinkage factor, would you not?

A Yes, sir, if we were metering the Wolfcamp side, but since we don't propose to meter the Wolfcamp side, we will have no meter factor to calculate on that side. Therefore, what we meter through the Devonian meter multiplied by the shrinkage factor, would give us the Devonian oil which subtracted from our pipeline runs would give us the Wolfcamp oil.

Q There could be an additional correction on your Wolfcamp volume, could there not, if the shrinkage factor was given in the Devonian?

A That's correct. No, there wouldn't be, because when you get the Wolfcamp to the stock tank you have its volume at zero; then when you meter the Devonian through the meter and multiply the meter factor by the shrinkage factor, you have the stock tank Devonian oil, so that the Devonian from the pipeline

runs gives you stock tank Wolfcamp oil. The only difference would be in weathering; if there was a difference in weathering in the stock tanks, then you would need a correction on stock tank oil. But we feel since PCT analysis indicates that the shrinkage is almost identical, that it will be the same on weathering in the tanks. They will weather identically in the tanks.

Q Yes, but the point I want to make is that if you did run this test on the Wolfcamp side you wouldn't have to make that assumption that the weathering is the same on both crudes?

A That's correct.

Q On your Exhibit No. 2-B, actually the value of the commingled oil as against your separate sales is just one cent, is that correct?

A That's correct. Two cents, you mean the value of the crude?

Q Yes.

A It's two cents difference, the Wolfcamp being penalized for higher gravity.

Q Yes, there's two cents difference, but the average between the two would be 298.

A That's correct.

Q And the commingled would be 299?

A That's right.

MR. UTZ: Any other questions of the witness?

MR. MORRIS: Yes.

BY MR. MORRIS:

Q On your Exhibit No. 3 you show a three-way, three-position valve going into your test lubes?

A Yes.

Q What is the third position of this valve? Would it allow crude to pass directly through from one zone to the other?

A No, the third position is closed.

Q Just closed?

A Right. It would be so pneumatically controlled that the switcher would either have Devonian or Wolfcamp or closed position on his control.

Q So you are not relying on the check valve to keep the flow of oil from one zone from getting into the lines of the other zone?

A No, sir.

Q Now, the Wolfcamp wells are shown on your Exhibit No. 4 to all be marginal, at least from the production history from the months of September and October, 1961. Do the months' production before September, 1961 bear these figures out as being reliable?

A Yes, sir, I would say, I don't know exactly, but at least the last five years.

Q And since October the Wolfcamp wells have remained

marginal?

A Yes, sir. This is the latest information we have.

Q Your Well No. 11 in the Wolfcamp is, I believe, you show to be the highest. Does it range upwards from 83 on a daily basis?

A It possibly could, but I would say that, the condition of the reservoir, it would be more likely to come on down.

Q Are you planning any reworking operations on any of the Wolfcamp wells?

A No, sir. There is a secondary recovery unit proposed now. If this Wolfcamp goes into the secondary recovery unit, I suspect that the Wolfcamp will be pulled out of this unit altogether.

Q In that event I suppose we would, the Commission should make some condition in its order, as usual, that when the Wolfcamp becomes capable of producing top allowable in this situation, it would have to be pulled out of the commingling installation?

A Or metered.

Q Or metered?

A Yes, sir.

MR. UTZ: Or metered.

A I would like to say at this time we would also like that same stipulation on the Devonian side should it become marginal. We would like to put it on a quarterly test basis, but

we would make administrative application for that at the time.

Q (By Mr. Morris) You would be eligible for administrative approval if all the wells there should become marginal?

A Yes.

Q Mr. McGee, you pointed out several instances where this installation and your operation of it will differ from the commingling manual adopted by the Commission. Can you think of any other particulars in which the installation or its operation will vary from that manual because, as you may be aware, we usually include a provision in our order approving commingling installation, that they will be operated in accordance with the manual?

A No, sir, I cannot think of any.

MR. UTZ: Isn't this weathering deal a little different than the manual specifies?

A It would be, except that we are allowed to prove with a master meter. Now, to prove downstream of the dump valve on our separator meter, we would flash our fluid from 60 to 25 PSI and when we flash it we are going to have gas break out. This would mean that gas would pass through the master meter, which would give us a reading that you could not correlate at all if you got gas in that meter. So that is one of the main reasons we want to go under pressure, so we don't have any gas in the fluid and we can get a better meter factor that way. We feel like there's no particular stipulation in the manual on applying

this shrinkage factor, but that we feel that we would get a better measurement with a master meter by applying it.

MR. MORRIS: I have no further questions. Thank you, Mr. McGee.

MR. UTZ: Are there other questions of the witness?

REDIRECT EXAMINATION

BY MR. ERREBO:

Q Were Mobil's Exhibits 1 through 6 prepared by you or under your supervision?

A They were.

MR. ERREBO: We offer the said exhibits in evidence.

MR. UTZ: Exhibits 1 through 6, including 2-B, will be entered into the record.

MR. ERREBO: That's all we have.

MR. UTZ: The witness may be excused.

(Witness excused.)

MR. UTZ: Are there other statements in this case?

The case will be taken under advisement.

We will take a ten minute recess.

STATE OF NEW MEXICO)
) ss.
COUNTY OF BERNALILLO)

I, ADA DEARNLEY, Court Reporter, do hereby certify that the foregoing and attached transcript of proceedings before the Oil Conservation Commission at Santa Fe, New Mexico, is a true and correct record to the best of my knowledge, skill, and ability.

IN WITNESS WHEREOF I have affixed my hand and notarial seal this 12th day of December, 1961.

Ada Dearnley
COURT REPORTER-NOTARY PUBLIC

My commission expires:

June 19, 1963

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 2454, heard by me on Dec. 11, 1961.

....., Examiner
New Mexico Oil Conservation Commission