STATE OF NEW MEXICO
ENERGY AND MINERALS DEPARTMENT
OIL CONSERVATION DIVISION
STATE LAND OFFICE BLDG.
SANTA FE, NEW MEXICO

9 May 1984

EXAMINER HEARING

IN THE MATTER OF:

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| Application of Union Texas Petroleum Corporation for downhole commingling, Rio Arriba County, New Mexico. | CASE 8186 |

BEFORE: Richard L. Stamets, Examiner

TRANSCRIPT OF HEARING

A P P E A R A N C E S

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| For the Oil Conservation Division: | W. Perry Pearce<br>Attorney at Law<br>Legal Counsel to the Division<br>State Land Office Bldg.<br>Santa Fe, New Mexico 87501 |
| For the Applicant: | William F. Carr<br>Attorney at Law<br>CAMPBELL, BYRD & BLACK P.A.<br>P. O. Box 2208<br>Santa Fe, New Mexico 87501 |

# I N D E X

MICHAEL R. HERRINGTON



# E X H I B I T S

MR. STAMETS: We'll call next Case 8186.

MR. PEARCE: That case is on the application of Union Texas Petroleum Corporation for downhole commingling, Rio Arriba County, New Mexico.

MR. CARR: May it please the Examiner, my name is William F. Carr, with the law firm Campbell, Byrd and Black, P. A., of Santa Fe, appearing on behalf of Union Texas Petroleum Corporation.

I have one witness who needs to be sworn.

MR. PEARCE: Are there other appearances in this matter?

(Witness sworn.)

MICHAEL R. HERRINGTON,

being called as a witness and being duly sworn upon his oath, testified as follows, to-wit:

DIRECT EXAMINATION

BY MR. CARR:

Q Will you state your name and place of residence?

A Michael R. Herrington of Farmington, New Mexico.

Q Will you spell your last name, please?

A H-E-R-R-I-N-G-T-O-N.

Q By whom are you employed and in what capacity?

A I'm employed by Union Texas Petroleum Corporation as a petroleum engineer.

Q Have you previously testified before this Commission or one of its examiners and had your credentials accepted and made a matter of record?

A Yes, I have.

Q And were you qualified as a petroleum engineer at that time?

A Yes.

Q Are you familiar with the application in Case 8186?

A I am.

Q Are you familiar with the area that's the subject of this application?

A Yes, I am.

MR. CARR: Are the witness' qualifications acceptable?

MR. STAMETS: They are.

Q Mr. Herrington, would you briefly state what Union Texas Petroleum Corporation seeks to accomplish with this application?

A By this application Union Texas Petroleum Corporation is requesting an order from the New Mexico Oil

Conservation Division to give us blanket approval to commingle Mesaverde, Gallup and Dakota production in our Jicarilla F Lease located in Township 26 North, Range 4 West of Rio Arriba County, New Mexico.

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

A Yes. We've prepared several exhibits.

Q Would you refer to what has been marked for identification as Union Texas Petroleum Company Exhibit Number -- Union Texas Petroleum Corporation Exhibit Number One, identify the exhibit and explain it?

A Exhibit Number One is a plat showing the Union Texas Petroleum Corporation operated acreage in the subject area.

Of particular interest in this case is the four-section Jicarilla F Lease. The F Lease area is outlined on the plat and contains about 2560 acres.

The plat further shows existing commingles already approved in the area. Mesaverde-Dakota commingles are indicated by a red dot and Gallup-Dakota commingles are shown with a green dot.

Two geologic cross sections are identified on this plat as A-A' and B-B'. They are indicated with a broken line and will be discussed in detail on later exhibits.

Q What pools do you propose to downhole

commingle in this area?

A If you'll refer to Exhibit Number Two, Exhibit Number Two shows existing pools in relation to the subject acreage. We propose to commingle the Blanco Mesaverde, the Undesignated and Wild Horse Gallup Pool Extension, Basin Dakota Pool and the Wild Horse Dakota Pool Extension.

Q Is the ownership common in each of the zones to be commingled?

A Yes. The ownership of the Mesaverde, Gallup and Dakota are common in the proposed commingle area.

Q Would you refer to your Exhibit Number Three --

MR. STAMETS: Could we stop there just a second and let me get this straight?

We have Wild Horse Dakota oil, is that correct?

A Yes, sir, I believe that's correct.

MR. STAMETS: And Wild Horse Gallup gas?

A Yes, sir.

MR. STAMETS: And the Tapacito Pool is not in there.

A No, sir.

MR. STAMETS: Okay. And then Blanco Mesaverde, okay. So we're still talking about three formations, Mesaverde, Gallup and Dakota.

A Yes, sir, that's correct.

MR. STAMETS: Okay.

Q Is the -- did you testify, is the ownership common in each of these zones?

A Yes, sir, it is.

Q Would you now refer to what has been marked for identification as Exhibit Number Three and review this for Mr. Stamets?

A Yes. Exhibit Number Three shows a wellbore schematic of the Jicarilla H No. 7 in which the Gallup and Dakota are successfully commingled downhole and are produced by flowing up the tubing using Dakota gas for lifting energy.

Q Will you now review Exhibit Number Four?

A Exhibit Number Four shows a wellbore schematic of Tenneco's Jicarilla C No. 5 Well in which the Mesaverde and Dakota commingling has been successfully implemented, again with the Dakota gas providing lifting energy.

These wells are both completed by perforating the selected pay zones and then breaking down with acid and stimulating with gelled water and sand, isolating the Mesaverde and Gallup from the Dakota during the completion operations.

Q Will you now review Exhibit Number Five?

A Yes. Exhibit Number Five shows typical decline curves for the Mesaverde, Gallup and Dakota in com-

mingled wells located near the proposed Jicarilla F commingle area.

On page one our Jicarill H No. 7 is shown on the top curve and Amoco's Jicarilla 102 14E on the bottom curve.

Gallup production is indicated on the left and Dakota production on the right of each of the curves.

On page two Tenneco's Jicarilla C No. 4 is shown in the top curve and their Jicarilla C No. 5 is shown on the bottom curve. Mesaverde production is shown on the left and Dakota production on the right in each of the decline curves. It can be seen that both zones of both the Mesaverde and the Gallup-Dakota commingles maintained or increased production after commingling. The arrows indicate the commingling dates in each of the curves.

Q Mr. Herrington, will you now refer to Exhibit Number Six and review this for the Examiner?

A Yes. Exhibit Number Six shows the proposed downhole commingling of Mesaverde, Gallup and Dakota in each of our -- in our Jicarilla F Lease wells.

Q Would you now go to the geologic cross sections, Exhibit Seven and Exhibit Eight, and review these?

A Exhibits Seven and Eight are geologic cross sections constructed using the electric logs in the area of this application.

These two cross sections demonstrate the

continuity of the producing intervals from the area of the application through areas where commingling of the reservoirs has been permitted.

We can see the Mesaverde, Gallup and Dakota producing intervals occur and correlate throughout this area. The cross sections were previously indicated in Exhibit Number One.

Q Will you now identify and explain Exhibit Number Nine?

A Exhibit Number Nine shows typical gas/oil ratios for the subject area. It is seen that the Mesaverde, Gallup and Dakota have similar pressure gradients and nearly identical pressures when compared at a common datum.

Q Have you prepared a compilation of bottom hole pressure data for each zone to be commingled in this area?

A Yes, we have. We believe the bottom hole pressures presented in Exhibit Nine for the Mesaverde, Gallup and Dakota are consistent with the data presented in offsetting wells for commingling.

Q Mr. Herrington --

MR. STAMETS: While we're right there, Mr. Herrington, why -- why are the pressures on the No. 5 Well substantially higher than the rest of the wells?

A As indicated, those are relatively current pressures. They were obtained in 1981 and the F-5 was a fairly recent completion at that time.

The A-8, E-7, and E-8 Wells had substantial production before that time and represent pressures of a later time in the well's life.

Q Now referring to Exhibit Nine, what does this exhibit show as far as the pressure differentials that you expect will be experienced across the perforations in each of the zones?

A This exhibit shows a very small difference in pressure gradient in the subject zones and nearly identical bottom hole pressures when corrected to a common datum.

Q Will these pressure differentials result in gas migration between zones?

A No. We anticipate bottom hole producing pressures far below any of the individual reservoir pressures, which will not allow any cross flow to occur.

If the wells are shut in, an insignificant amount of cross flow may occur as the pressures stabilize in the wellbore. Any gas involved would be recoverable when the well is returned to production.

Q Are the three zones to be commingled in the subject area capable of only marginal production?

A Yes. All of the Mesaverde and Dakota completions in the Jicarilla F Lease are classified as marginal. No Gallup completions have been attempted in our Jicarilla F Lease because of its marginal nature.

Offsets that do produce from the Gallup

are also marginal.

Exhibit Number Ten is a production summary for wells in the vicinity of the subject area and indicate average daily rates of 68.3 Mcf per day and 6/10ths of a barrel of oil per day for the Mesaverde; 126.3 Mcf per day and 9/10ths barrel of oil per day for the Gallup; 73.9 Mcf per day and 2.2 barrels of oil per day for the Dakota.

Q Are the zones flowing or being artificially lifted?

A The zones are flowing and if the commingled completion was not effective in removing all produced liquids a plunger lift or rod pumping system could easily be installed to remove any produced liquids.

Q Have you taken production data and calculated an average rate of production to be attributed to each zone in terms of gas, water, and oil production?

A Yes. Our production records shown in Exhibit Number Ten indicate the average daily rates for each of the three zones of interest.

Q Are you prepared to make a recommendation to Mr. Stamets as to the allocation of production to each of the commingled zones?

A Yes. As we see in Exhibit Number Ten, we have estimated the allocation split but I would recommend that we consult with the District Supervisor and mutually agree upon an allocation for each zone after the wells have been -- after future wells have been drilled and tested.

Q Would you describe the characteristics and make a comparison of the compatibilities of the fluids produced from each zone?

A Yes. Exhibit Number Eleven is a recent laboratory analysis of oil samples from each of the three zones, Mesaverde, Gallup and Dakota.

It can be seen from the analyst's remarks that no detrimental effects are expected in commingling of the three oils. No detrimental effects have been observed in offset commingled wells, either.

Q Would you describe the content of the gases that you expect to encounter?

A Yes. If we refer back to Exhibit Number Nine, we can see that the BTU content of the three gases is also very similar and again no detrimental effects have been observed in our presently commingled wells.

Q Are the reservoir characteristics of these pools such that underground waste will not be caused by the proposed downhole commingling?

A Quite the contrary. Because of the marginal nature of the three zones in this area commingling of the three zones will allow production of hydrocarbons which would not otherwise be economically producable.

Q In your opinion will granting this application result in the increased recovery of hydrocarbons?

A Yes, most definitely. First, reserves which will be left undeveloped otherwise can be produced and

second, based upon the offsetting wells in which commingling has been approved, we've seen increases in production upon commingling.

Q Mr. Herrington, will the value of the commingled production exceed the sum of the values of the production from each of the individual zones?

A Yes, it will.

Q Will economic savings result from the proposed downhole commingling?

A Yes, it will.

Q In your opinion will granting this application be in the best interest of conservation, the prevention of waste and the protection of correlative rights?

A Yes, it will.

Q Were Exhibits One through Eleven prepared by you or compiled under your direction and supervision?

A They were.

Q Can you testify from your own knowledge as to their accuracy?

A Yes, they are accurate.

MR. CARR: Mr. Stamets, at this time we would offer into evidence Union Texas Petroleum Corporation's Exhibits One through Eleven.

MR. STAMETS: These exhibits will be admitted.

MR. CARR: And that concludes my direct examination of this witness.

CROSS EXAMINATION

BY MR. STAMETS:

Q Mr. Herrington, does Union Texas understand that if these wells should become six times over produced in one of the proration gas pools that they would be required to be shut in?

A Yes, sir, we are of that understanding, although all of the -- all of the gas wells presently located in the F Lease are classified as marginal, which are not subject to that allocation overproduction rule.

Q Okay.

MR. STAMETS: Any other questions of the witness? He may be excused.

Anything further in this case?

MR. CARR: Nothing further, Mr. Stamets.

MR. STAMETS: The case will be taken under advisement.

(Hearing concluded.)

# C E R T I F I C A T E

I, SALLY W. BOYD, C.S.R., DO HEREBY CERTIFY that the foregoing Transcript of Hearing before the Oil Conservation Division was reported by me; that the said transcript is a full, true, and correct record of the hearing, prepared by me to the best of my ability.

Sally W. Boyd CSR

I do hereby certify that the foregoing is a complete record of the proceedings in the Examiner hearing of Case No. 8156 heard by me on 5-9 1954.

Richard L. Stamets, Examiner
Oil Conservation Division