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JASON KELLAHIN (RETIRED 1991)

January 31, 1996

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JAN 31 1996

Oil Conservation Division

Mr. Michael E. Stogner
Hearing Examiner
Oil Conservation Division
2040 South Pacheco
Santa Fe, New Mexico 87502

*Re: NMOCD Cases 10793, 10981 & 11004
Infill Drilling Pecos Slope Abo Gas Pool*

*Re: NMOCD Case 11421
Infill Drilling South Pecos Slope Abo Gas Pool*

*Re: NMOCD Case 11422
Infill Drilling West Pecos Slope Abo Gas Pool*

Dear Mr. Stogner:

On behalf of Great Western Drilling Company, I wish to express our appreciation to you for providing us with both the time and opportunity to review the data submitted by Yates Petroleum Corporation in support of its request for the adoption of infill drilling for the three different Pecos Slope Abo Gas Pools at the November 2, 1995 hearing held in Roswell, New Mexico.

Great Western has concluded that infill drilling rules will be practical for only selected portions of these pools (collective "the pool") and will not be necessary on a pool wide basis. Our conclusion is support by the following:

GEOLOGY

Because the pool consists of multiple, highly sinuous channel sands, the drilling of a successful infill well in the "heart of the pool" located in Township 6 South, Range 25 East, will not result in similar infill successes for wells drilled in areas of the pool, even in Township 6 South, Range 25 East, where the channel sands are more poorly developed.

Geologically, the somewhat narrow and elongated nature of the channels would preclude the use of a circular radius of drainage pattern as a model for volumetric calculations of estimated ultimate recovery ("EUR"). Further, the lack of the use of a productive limit porosity cutoff skews the data so as to cause Yates to predict a smaller radius of drainage than what is actually present. That is because a thicker gross sand section with a given volume of gas will have a smaller radius of drainage than a thinner net sand interval (using an effective porosity cutoff to determine net sand thickness) with the same given volume of gas which will have a larger radius of drainage than Yates is calculating.

DRAINAGE

There is insufficient evidence concerning drainage areas to support adopting infill drilling:

- (1) Yates selected infill locations based upon good sand thickness, good cumulative production and the belief that those locations would be outside the calculated drainage area of existing wells **but** conceded that neither their volumetric circle method or the reservoir simulation method was able to accurately predict the drainage areas of existing wells;
- (2) all but two of the infill wells had been drilled in areas which were being depleted by offsetting wells;
- (3) the degree of pressure depletion from virgin pressure of 1125 psi was directly related to the distance each infill well was from existing offset wells; and

(4) those infill wells with higher initial pressures were in fact drilled on 160-acre equivalent units and were not "true" 80-acre infill wells.

RESULTS OF INFILL DRILLING

While Yates contends that Infill Drilling was justified for the entire pool because the initial pressure of the infill wells, with few exceptions, was 300" to 400# higher than the average current pressure of offsetting existing wells, the evidence shows that:

- (1) in only two infill well cases did the infill well encounter "new sands" which justified the "new reserves" **while** in all other infill wells examples, the "new reserves" were attributable to inadequate drainage by existing wells; and
- (2) that many existing infill wells would drain outside of their respective spacing units but Yates had not calculated what the drainage acreage would be and could not determine its shape.

ECONOMICS

While Yates contends that infill wells could be drilled on a pool wide basis without causing the drilling of unnecessary offset protection wells, the evidence shows that:

- (1) Yates' economic threshold was 400,000 mcf cumulative gas produced; and
- (2) many infill wells had calculated estimated ultimate recoveries which were less than 800,000 mcf thereby making it uneconomic for the second offset ("protection") well. See Yates Exhibit 17.

PRODUCTION CURVES

While Yates contends that the initial production rates of the infill well were generally higher than the average of the existing offset and that existing wells were reaching low rates with low remaining recoveries, therefore concluding that the infill wells were producing only new reserves, the evidence shows that:

- (1) the original method Yates used for apportioning an infill wells' forecasted EUR between new reserves and existing reserves based upon a pressure ratio was flawed and that Yates had abandoned using it;
- (2) that the initial rates on Exhibit 16 for the infill wells were in fact CAOF rates; and
- (3) while the existing wells had partially depleted the area currently being drained by the infill well, any remaining recovery for either the infill well and the offset existing wells would be unique to that particular well.

RESERVES

While Yates contends that it could estimate an EUR for the infill wells and all of the EUR for that infill well would be new reserves not capable of being produced by the existing offset wells, the evidence shows that it had not calculated a drainage acres for each well and did not know if a well would drain 80, 160, 320 acres or not.

PROTECTION OF CORRELATIVE RIGHTS

While Yates contends that infill drilling would allow all operators the chance for infill wells, the evidence shows that:

- (1) many of the infill wells would not have enough EUR to support an offset second well; and

(2) because of the hyperbolic nature of the production curves, the first well drilled would likely get a majority of the EUR in the area within the first 2 years thus precluding the offset operator from having a chance to share economically.

PRORATIONING

The Division was correct to include the topic of "prorationing" when it docketed the infill issue for hearing because the adoption of an "infill" provision for this pool will compel the adoption of prorationing. The fact that Yates has already drilled fifteen of the twenty-six approved infill wells creates a gas allowable problem:

(1) Should the Division deny pool wide infill drilling then it still must set an allowable for those spacing units which now have two producing wells or, in the alternative, require Yates to shut in one of them. Great Western recommends that the Division deny infill drilling and set a hearing for Yates to appear and show cause why it should be allowed to produce the infill wells concurrently with the parent well.

(2) Should the Division grant pool wide infill drilling, then it is essential to also adopt prorationing in order to protect correlative rights. Great Western recommends that should the Division grant infill drilling that it also adopt prorationing and have the Commission establish the gas allowables for the pool at its next allowable hearing currently set for February 15, 1996.

SUMMARY

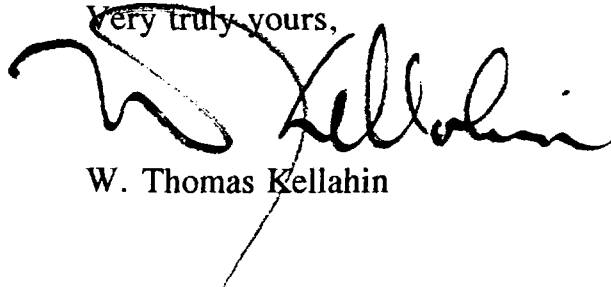
Great Western Drilling Company has concluded that the science and engineering evidence necessary to support the drilling of infill wells on a pool wide basis has not been presented.

Despite reservoir complexity and low permeability, Yates has presented convincing evidence that the overall reservoir pressure has been drawn down in the pool and new wells are not likely to encounter virgin pressure. Thus, new wells generally will simply accelerate the rate of recovery of existing reserves rather than increase ultimate pool recovery.

Michael E. Stogner
January 31, 1996
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Based upon Yates' economic evidence, the adoption of optional infill drilling will force the offset operator into drilling another well where, in most instances, only the first infill well will have any opportunity to achieve payout.

Very truly yours,

A handwritten signature in black ink, appearing to read "W. Thomas Kellahin". The signature is written in a cursive style with a large, sweeping initial "W".

W. Thomas Kellahin

*cc: William F. Carr, Esq.
Attorney for Yates Petroleum Corporation*

*cc: Great Western Drilling Company
Attn: Russell Richards*