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## HAND DELIVERED

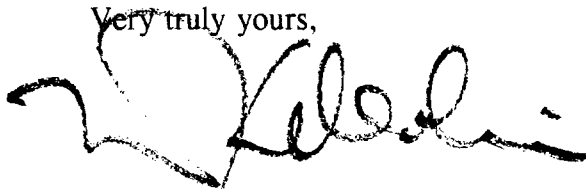
Mr. Michael E. Stogner  
Hearing Examiner  
Oil Conservation Division  
2040 South Pacheco  
Santa Fe, New Mexico 87505

*Re: NMOCD Case 11526  
South Dagger Draw*

Dear Mr. Stogner:

On behalf of Conoco, Inc., please find enclosed for your consideration our proposed order for the referenced case.

Very truly yours,

A handwritten signature in dark ink, appearing to read 'W. Thomas Kellahin', written over a horizontal line.

W. Thomas Kellahin

cc: Conoco Inc.

Attn: Jerry Hoover

Attn: Bill Hardie

cc: William F. Carr, Esq.

Attorney for Yates Petroleum Corporation

cc: Edmund H. Kendrick, Esq.

Attorney for Marathon Oil Company

cc: James G. Bruce, Esq.

Attorney for Mewbourne Oil Company

**STATE OF NEW MEXICO  
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT  
OIL CONSERVATION DIVISION**

**IN THE MATTER OF THE HEARING  
CALLED BY THE OIL CONSERVATION  
DIVISION FOR THE PURPOSE OF  
CONSIDERING:**

**CASE NO. 11526  
Order No. R-\_\_\_\_\_**

**APPLICATION OF YATES PETROLEUM CORPORATION  
FOR AMENDMENT OF THE SPECIAL RULES AND  
REGULATIONS FOR THE SOUTH DAGGER  
DRAW-UPPER PENNSYLVANIAN ASSOCIATED POOL,  
AND FOR THE CANCELLATION OF OVERPRODUCTION,  
EDDY COUNTY, NEW MEXICO.**

**CONOCO'S  
PROPOSED  
ORDER OF THE DIVISION**

**BY THE DIVISION:**

This cause came on for hearing at 8:15 a.m. on May 3, 1996, at Santa Fe, New Mexico, before Examiner Michael E. Stogner.

NOW, on this \_\_\_\_ day of July, 1996, the Division Director, having considered the testimony, the record, and the recommendations of the Examiner, and being fully advised in the premises,

**FINDS THAT:**

(1) Due public notice having been given as required by law, the Division has jurisdiction of this cause and the subject matter thereof.

### **YATES' REQUEST**

- (2) The Applicant, Yates Petroleum Corporation ("Yates") seeks:
  - (a) to amend Rule 22 of the Special Rules and Regulations for the South Dagger Draw-Upper Pennsylvanian Associated Pool ("the South Dagger Draw Pool") by increasing the current 1400 barrels of oil per day special depth bracket allowable assigned to a standard 320-acre spacing and proration unit to 8,000 barrels of oil per day; and
  - (b) to cancel all overproduction accumulated by certain operators in the pool who have produced certain oil proration and spacing units in excess of the current allowable of 1400 barrels of oil per day.

### **BACKGROUND**

(3) South Dagger Draw Pool is the middle pool of an extensive dolomite fairway hydrocarbon reservoir in Eddy County, New Mexico, currently subdivided into three pools, the southern portion of which is structurally the highest and is classified as a gas pool being designated as the "Indian Basin Upper Pennsylvanian Gas Pool." The northern-most portion, which is structurally the lowest part of this extensive continuous dolomite reservoir, is classified as an oil pool and is designated as the "North Dagger Draw Upper Pennsylvanian Oil Pool."

(4) The middle portion of this continuous reservoir declines structurally from southwest to northeast and represents an extensive transition area from the gas pool to the south (Indian Basin) and the oil pool to the north (North Dagger Draw). This transitional area is classified as an associated oil-gas pool and is designated as the "South Dagger Draw-Upper Pennsylvanian Associated Pool."

(5) This middle, transitional pool ("South Dagger Draw Pool") presents special reservoir management problems associated with the inclusion of gas wells on the southern and western periphery of the pool, oil wells on the northern and eastern side, and a mixture of high GOR oil wells and gas wells through the middle of the pool, which cannot be resolved with traditional rules for either gas or oil pools.

(6) South Dagger Draw Pool should be subject to appropriate regulatory rules for this "transition area" between North Dagger Draw Pool and the Indian Basin Gas Pool.

#### **CURRENT RULES FOR THESE RESERVOIRS**

(7) The current rules for the Indian Basin Upper Penn Gas Pool provide for 640-acre gas spacing and proration units with the option for multiple gas wells in a single such unit with a current MAXIMUM GAS ALLOWABLE for this prorated gas pool of 6,000 MCFPD per 640-acre gas spacing and proration unit.

(8) The current rules for the North Dagger Draw Oil Pool provide for 160-acre spacing and proration units with the option for multiple oil wells in a single such unit. The current maximum oil allowable for North Dagger Draw Pool provides for top oil allowable of 700 BOPD. The current maximum gas allowable provides for 7,000 MCFPD per 160-acre spacing unit (GOR of 10,000 to 1 times the top oil allowable of 700 BOPD).

(9) The current rules for the South Dagger Draw Pool provide for 320-acre proration and spacing units with the option for multiple oil wells and multiple gas wells and allow the simultaneous dedication of both oil and gas wells to the same unit. See Order R-5353-L-1. The current maximum gas allowable for the South Dagger Draw Pool provides for 9,800 MCFPD per 320-acre spacing unit (GOR of 7,000 to 1 times the top oil allowable of 1,400 BOPD).

### **PRIOR DIVISION DECISIONS AFFECTING SOUTH DAGGER DRAW**

(10) On January 26, 1994, the Division issued Order R-10050 in Cases 10869 and 10881 which reduced the existing 10,000 to 1 gas-oil ratio limitation to 7,000 to 1 limitation which had the effect of reducing the gas allowable from 14 MMCF gas per day to 9.8 MMCF of gas per day (7,000 GOR x 1400 BOPD) per 320-acre proration unit in the South Dagger Draw Pool.

(11) Division Order R-10050 established a gas allowable per proration unit limitation of 9.8 MMCF gas per day to assure that excessive reservoir energy is not depleted from the reservoir and to avoid reducing ultimate oil recovery. See Finding (32) of Order R-10050.

(12) The Division was concerned that the premature depletion of the gas cap would result in oil being left unrecovered in the reservoir which otherwise would be recoverable and thereby causing waste and that a reduction in the gas allowable limit was needed for the South Dagger Draw Pool to prevent the premature depletion of the gas cap which will preserve the ability to maximize oil recovery from this associated pool thereby preventing waste.

### **SOUTH DAGGER DRAW POOL**

(13) From the geologic and reservoir engineering presentations submitted by both Yates and Conoco in Division Cases 11526, 10869 and 10881, the Division finds that:

(a) The South Dagger Draw Pool is a brittle, vugular dolomite with good vertical permeability. This combination of vugs, fractures and vertical permeability provide the necessary flow channels to permit gas-cap gas to reach the perforations in wells which would otherwise normally be limited to production from the oil column;

(b) The oil column is overlain by a gas column of varying thickness within the South Dagger Draw Pool;

(c) many wells in the South Dagger Draw Pool have been routinely perforated in the overlying gas column as evidence by completion and producing records;

(d) Even wells that have been completed only in the oil column, as exhibited by Conoco's completions in Section 35, T20S, R24E, require stimulation treatments such that it is virtually impossible to prevent communication with the overlying gas column and the production of gas-cap gas from oil well completions.

(e) the South Dagger Draw Pool is a complex reservoir with a combination of gas-cap expansion, solution-gas drive and weak water influx drive mechanism;

(f) the "gas-cap" in the South Dagger Draw Pool is in pressure communication with the oil column and extends throughout the pool as demonstrated by Conoco's initial pressures in the recently drilled Preston Nos. 5, 8 and 9 oil wells as compared to the 20-year old producing Preston No 1 gas well. These three wells confirm this pressure communication between the oil and gas columns over a 1-1/2 mile area extending across the reservoir;

(g) production data demonstrates that the current producing GOR for the pool is nearly 5 times greater than the original solution gas-oil ratio of 911 SCF/STB as documented by PVT data;

(h) under current rules, the South Dagger Draw Pool is being produced such that approximately 80 % of the gas produced from the oil wells in the pool is free gas-cap gas.

### **AFFECT OF YATES' REQUEST**

(14) Yates' application in this case for these pool-wide changes, if approved, would increase the gas allowable limitation from 9.8 MMCF per day to a new maximum 56 MMCF per day (7,000 GOR x 8000 BOPD) per proration unit which will have a dramatic impact on the prevention of waste, ultimate recovery of oil and correlative rights in the South Dagger Draw Pool.

(15) Since the South Dagger Draw Pool is an associated oil and gas pool, this six-fold increase in gas allowable would provide the uncontrolled potential to prematurely "blow-down" the extensive gas cap and waste significant oil reserves associated with in.

(16) Historically, the Division has accommodated Yates and granted Yates' previous applications to adopt rules for the South Dagger Draw Pool which paralleled the rules adopted for North Dagger Draw-Upper Pennsylvanian Pool ("the North Dagger Draw Pool") based upon the assumption that such action would lead to consistent development of both pools by similar operating rules. See Order R-5353-L entered on March 25, 1991 in Case 10222.

(17) Yates testified that it was seeking changes in both the North and South Dagger Draw Pools because both pools were in the "same geologic body" (See Transcript page 15)

(18) Yates also testified that while the North and South Dagger Draw Pools are in the same continuous geologic body, there are variations within this body with regard to reservoir quality. (See Transcript page 15)

(19) However, on June 17, 1993 in Case 10748, Yates submitted expert petroleum engineering testimony that South Dagger Draw Pool had been over developed on 40-acre well spacing which is too dense for this type of reservoir. See Finding (14) Order R-9922 issued July 6, 1993.

(20) The current actual maximum gas producing rate from any spacing unit in South Dagger Draw Pool is approximately 9,000 MCFGPD from the Yates' operated spacing unit consisting of the W/2 of Section 15, T20S, R24E.

(21) The current actual maximum oil producing rate from any spacing unit in South Dagger Draw Pool is approximately 1,000 BOPD from the Yates' operated spacing unit which includes the Diamond AK Well No. 1 in (Unit N) of Section 34, T20S, R24E.

(22) Therefore, based upon the foregoing, the Division concludes that:

(a) Unlike North Dagger Draw, South Dagger Draw is affected by a significant gas cap connected to a thin oil rim;

(b) Although the North Dagger Draw and South Dagger Draw pools may be the same continuous geologic body, and initially developed using "equivalent" rules, there has now been sufficient wells drilled with enough production history that each pool should be developed based upon the performance of their own wells; and

(c) Accordingly, there is no reason that the pool rules must be or should be "identical".

#### **ANALYSIS OF YATES' PETROLEUM ENGINEERING PRESENTATION**

(23) In support of its request, Yates:

(a) plotted swabbing oil cut versus second month producing oil cut for some 58 wells in North and South Dagger Draw Pools and from its plot of the oil cuts of this "early-time well performance data", hypothesized that a positive slope "confirmed" that at high rates, a well



would produce less water per barrel of oil produced. (See Transcript page 32-34) (Yates Exhibit 6);

(b) presented 17 examples for wells in North Dagger Draw Pool of plots of oil cut versus oil rate during the early time performance of these wells and hypothesized that this confirmed that at higher rates of withdrawal, more oil and less water were being produced. Yates Exhibit 5, Transcript pages 28-32; and

(c) that the Diamond AKI Well in South Dagger Draw and the Aparejo APA Well No. 5 in North Dagger Draw had been produced for approximately 2 weeks and different rates which showed at higher rates each produced "higher oil cuts". See Transcript page 35-39

(24) Yates also presented the following additional information:

(a) that there is minimum pressure data available for either pool, however when Yates completed its State K Well No.2 in Unit J of Section 28, T19S, R25E, NMPM its initial pressure was approximately 2100 psi compared to an original reservoir pressure of 2900 to 3100 psi confirming that the reservoir had already been partially drained and depleted at this location by offsetting production; See Transcript pages 81-82.

(b) that within approximately six section area within North Dagger Draw consisting of portions of Sections 8,9,21,29 and 28 T19S, R35E, NMPM, there are 11 wells interfering with each other production; Yates Exhibit 9 Transcript page 42-45.

(c) Yates has not conducted any reservoir studies concerning pressure depletion and its affect upon correlative rights; See Transcript page 83

(d) Yates admitted that as the pressure in the reservoir is depleted, production rates declines, the differential pressure between the reservoir and the wellbore goes down, fluid rates go down so that the earliest wells drilled in an area which are produced at the maximum possible rate will have a significant advantage over the ultimate recoveries for wells drilled later; See Transcript page 85

(e) While Yates is unable to calculate drainage areas for wells in either pool and testified that a well's producing rate will be affected by changes in producing rates by offset wells which can be attributed to interference (See Transcript page 110), Yates believes the wells studied in North Dagger Draw are not draining more than 40-acres and could **therefore** be shut-in to make up for "overproduction" without being subject to offset drainage; See Transcript page 107.

(f) that no existing proration unit in the South Dagger Draw Pool had ever had the capacity to produce 8,000 BOPD;

(g) that there is interference among and between overproduced wells in North Dagger Draw; See Transcript page 43.

(h) Yates has not looked for an example of performance affects in South Dagger Draw Pool; See Transcript Page 112.

## **OTHER OPERATORS**

(25) Conoco, Inc. and Marathon Oil Company appeared and supported increasing the oil allowable in this pool to 4,000 BOPD **provided** the gas-oil ratio limit was reduced to 3,500 cubic feet of gas per barrel of oil for a limiting gas allowable of 14,000 MCFPD.

## **FINDINGS OF THE DIVISION CONCERNING YATES' TECHNICAL EVIDENCE**

(26) Yates failed to demonstrate with substantial evidence whether this early time performance was nothing more than accelerating the rate of recovery of the same amount of ultimate oil or whether in fact such higher early time rates would result in increasing the amount of oil ultimately recovered from either of these pools.

(27) Yates failed to demonstrate with substantial evidence that its "early-time" analysis of these wells represents (a) "pseudosteady-state production" during which the entire drainage area starts to contribute production and accurate reservoir recoveries can be calculated or (b) is simply attributable to well performance under transient production during which a well's inflow performance is unstable and producing oil versus water rates may not correctly reflect performance during these unstabilized conditions.

(28) Yates failed to submit engineering calculations showing estimated ultimate recovery for any well in either pool and failed to submit any production decline curves for any of the 17 wells shown on Yates Exhibit 5 so that any other engineer could calculate those ultimate recoveries; See Transcript page 85

(29) Yates' failed to demonstrate with substantial evidence that increasing the oil rate was not being accomplished by simply "taking" oil from adjoining wells and spacing units.

(30) Yates failed to undertake any specific study of South Dragger Draw to support increasing the oil rate to 8000 BOPD and simply assumed if the oil allowable in North Dagger Draw is increased to 4000 barrels of oil then South Dagger Draw Pool's allowable must also be increased an equivalent volume. See Transcript page 66

(31) That the short term step rates tests conducted on the Diamond AKI Well in South Dagger Draw and the Aparejo APA Well No. 5 in North Dagger Draw were conducted for too short a period and under conditions not verified by the Division and therefore cannot be considered typical or characteristic of the performances of all wells in the pool.

(32) Even if Yates is correct about higher rate meaning higher oil cut, Yates failed to present substantial evidence to show that such a an oil allowable of 8000 BOPD per spacing unit was necessary.

(33) Even if Yates is correct about higher rate meaning higher oil cut, that does not excuse Yates from liability for "overproducing" either pool's allowables.

(34) Yates' request is simply the result of Yates having drilled too many wells and produced them at too high a rate in an effort to drain offsetting spacing unit.

#### **ADDITIONAL FINDINGS BY THE DIVISION**

(35) The Division further finds that:

(a) based upon current production and engineering and geological reservoir evaluations, the current maximum oil allowable of 1,400 BOPD for a spacing unit in the South Dagger Draw Pool is appropriate;

(b) Yates' request for an increase to 8,000 BOPD is probably not achievable by a single spacing unit and will result in the waste of oil reserves if applied to multiple gas wells in the same spacing unit;

(c) the current gas allowable of 9.8 MMCFPD all wells in a spacing unit in the South Dagger Draw Pool is appropriate; and

(d) denial of Yates' requests is necessary in order to prevent excessive premature drainage of the gas cap and the waste of significant oil reserves.

(e) denial of Yates' requests and the continuance of the current rules will afford the opportunity to adequately recover both oil and gas reserves without causing undue waste.

(f) the evidence presented by Conoco demonstrates that the current rules and regulations for South Dagger Draw Pool have and will continue to provide for the orderly and efficient development and proper depletion of the South Dagger Draw Pool thereby preventing waste and protecting correlative rights;

(g) continuance of the current regulatory conservation methods imposed to minimize gas production from the gas cap in the Pool provide appropriate limitations necessary to protect the conservation of reservoir energy;

(h) Yates failed to sustain its burden of proving that the changes it seeks will result in increased ultimate oil recovery while doing so in a manner to protect correlative rights.

(i) Yates' request is simply an attempt to avoid the consequences of producing illegal oil and gas products from this pool and should be **denied**.

### **ILLEGAL OIL and GAS**

(36) Pursuant to Section 70-2-21 and 70-2-22 NMSA (1978), and its authority to adopt rules and regulations to effectuate prohibitions against the purchase or handling of "illegal gas and oil products", the Division has adopted rules and regulations which provide that:

(a) Illegal gas is defined by Division Rules to mean "natural gas produced from a gas well in excess of the allowable determined by the Division and the sale, purchase, acquisition, or the transporting refining processing or handling, in any way of said gas is prohibited. See Rule 0.1. and Rule 901

(b) Illegal oil is defined by Division Rules to mean "crude petroleum oil produced from an oil well in excess of the allowable fixed by the Division and the sale, purchase, acquisition, or the transporting refining processing or handling, in any way of said oil is prohibited. See Rule 0.1 and Rules 801 and 502.

(37) The Division has fixed and determined that any oil/and or gas produced from the South Dagger Draw Pool in excess of 1400 BOPD and/or 9.8 MMCFPD per 320-acre spacing and proration unit is illegal oil and illegal gas products.

(38) The Division lacks the resources to police compliance with its rules and regulations and expects all operators including Yates to comply with Division Rules and Regulations.

(39) Yates testified that in the summer of 1995, Yates was notified of its overproduction in the North Dagger Draw Pool by the Supervisor of the Artesia Office of the Division.

(40) As of approximately March 1, 1996, Yates had accumulated almost **ONE MILLION BARRELS OF OVERPRODUCTION** for its operated North Dagger Draw proration units.

(41) The production of illegal oil is a flagrant and willful disregard of the Division rules which is of significance to the ability of the Division to exercise its duties to prevent waste and protect correlative rights. Accordingly, the Division should direct the Supervisor of the Artesia office of the Oil Conservation Division to determine which proration unit and which operators have "overproduced either the oil and/or gas allowable sin

this pool and to impose a penalty of One Thousand Dollars per day per proration unit for each and every day said proration unit has been overproduced.

(42) Within thirty days of the date of this order, each and every operator of any proration unit in the pool which has been overproduced either the oil and/or gas allowable for this pool should pay said penalty by certified check or money order to the Director.

(43) That the Supervisor of the Artesia Office of the Division should provide a list to the Director of each and every operator of any proration unit in the pool which has been overproduced either the oil and/or gas allowable for this pool and shall immediately notify said operator that every well within a proration unit which is overproduced shall be immediately shut-in until said overproduction is made up.

**IT IS THEREFORE ORDERED THAT:**

(1) The application of Yates Petroleum Corporation in this case to:

(a) amend Rule 22 of the Special Rules and Regulations for the South Dagger Draw-Upper Pennsylvanian Associated Pool ("the South Dagger Draw Pool") by increasing the current 1400 barrels of oil per day special depth bracket allowable assigned to a standard 320-acre spacing and proration unit to 8,000 barrels of oil per day; and

(b) to cancel all overproduction accumulated by certain operators in the pool who have produced certain oil proration and spacing units in excess of the current allowable of 1400 barrels of oil per day.

**IS HEREBY DENIED.**

(2) The request of Conoco, Inc. and Marathon Oil Company to amend Rule 22 of the Special Rules and Regulations for the South Dagger Draw-Upper Pennsylvanian Associated Pool ("the South Dagger Draw Pool") by increasing the current 1400 barrels of oil per day special depth bracket allowable assigned to a standard 320-acre spacing and proration unit to 4,000 barrels of oil per day with a limiting gas-oil ratio of 3,500 cubic feet of gas to barrel of oil **IS HEREBY APPROVED.**

(3) That the Supervisor of the Artesia Office of the Division shall provide a list to the Director of each and every operator of any proration unit in the pool which has been overproduced either the oil and/or gas allowable for this pool and shall immediately notify said operator that every well within a proration unit which is overproduced shall be immediately shut-in until said overproduction is made up.

(4) A penalty of One Thousand Dollars per day per proration unit for each and every day said proration unit has been overproduced **is hereby imposed.**

(5) Within thirty days of the date of this order, each and every operator of any proration unit in the pool which has been overproduced either the oil and/or gas allowable for this pool shall pay said penalty by certified check or money order to the Director.

(6) Jurisdiction of this cause, including all parties hereto and the subject matter herein, is hereby retained for the entry of such further orders as the Division may deem necessary.

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

STATE OF NEW MEXICO  
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY  
Director.

SEAL