EXHIBIT NO. 5

GENERAL RESERVOIR DATA
BOULDER-MANCOS POOL
RIO ARRIBA COUNTY, NEW MEXICO

Reservoir:	Mancos formation
Type of Pay:	Fractured shale
Type of Structure:	Monocline
Type of Drive:	Liquid expansion, solution gas, and gravity
Number of Wells:	22 (June 1963)
Average Depth of Pay:	4,000'
Original FVF:	1.098
First BHP:	879 psig (10-1-62) @ +3,300'
Last BHP:	764 psig (4-30-63) @ +3,300'
Saturation Pressure:	802 psi
Reservoir Temperature:	141° F.
Gravity of Oil:	32° API
Specific Gravity of Gas:	0.885 @ Trap
Oil Viscosity in Reservoir:	3.05 cp above BP
Original Solution GOR:	138 cfpb
Average Producing GOR:	374 cfpb (February 1963)
Cumulative Production (Sotex Five Wells):	50,714 Barrels, 21,000 MCF (April 30, 1963)
Calculated Transmissibility:	31,800 md-ft. (average of three wells)
Calculated Permeability to Oil:	202 md. (average of three wells)

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. _____
CASE NO. _____

SEMI-LOGARITHMIC 359-71
KEUFFEL & ESSER CO.

CALCULATIONS:

$T = \frac{22{,}723 \text{ BBLS.}}{207 \text{ BPD}} = 2{,}640 \text{ HRS.}$

EXTRAPOLATED BHP = 711.5 PSI AT + 3441'
= 711.5 PSI + 141' (.352 PSI/FT)
= 761 PSIG AT + 3300'

TRANSMISSIBILITY = KH = 162.6 Q μ β / ΔP
= 162.6 x 207 x 3.05 x 1.098 / 2.5
= 45,100 MD - FT

PERMEABILITY = (45,100 MD - FT) / 154 FT.
= 293 MD

BUILDUP ANALYSIS
JICARILLA 4-26 No. 2
APRIL 27-30, 1963

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. 2857

BOTTOM HOLE PRESSURE (PSIG)

800
740
730
720
710
700

SLOPE = 2.5 PSI / CYCLE

1 10 100 1000

$\frac{T + \Delta T}{\Delta T}$

SEMI-LOGARITHMIC 359-71
KEUFFEL & ESSER CO.
3 CYCLES X 70 DIVISIONS

BUILDUP ANALYSIS
JICARILLA 4-26 No.3
APRIL 27-30, 1963

CALCULATIONS:

$T = \frac{22,972 \text{ BBLS}}{216 \text{ BPD}} = 2550 \text{ HRS}$

EXTRAPOLATED BHP = 747 PSI AT + 3358'
= 747 PSI + 58' (0.352 PSI/FT)
= 767 PSIG AT + 3300'

TRANSMISSIBILITY = KH = 162.6 Q μ B/ΔP
= 162.6 x 216 x 3.05 x 1.098 / 2.5
= 47,000 MD-FT

PERMEABILITY = (47,000 MD-FT) / 182 FT
= 258 MD

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 5
CASE NO. 3859

BOTTOM HOLE PRESSURE (PSIG)

780
770
760
750
740

SLOPE = 2.5 PSI/CYCLE

1 10 100 1000

$\frac{T+\Delta T}{\Delta T}$

BUILDUP ANALYSIS
JICARILLA 4-26 No.4
JAN. 1-16, 1963

CALCULATIONS:

$T = \frac{2872 \text{ BBLS}}{153 \text{ BFD}} = 451 \text{ HRS}$

EXTRAPOLATED BHP = 868 PSI AT + 3133'
= 866 PSI − 167' (0.360 PSI/FT)
= 808 PSI AT + 3300'

TRANSMISSIBILITY = KH = 162.6 Q μ B/ΔP
= 162.6 x 153 x 3.05 x 1.098 / 25
= 3,300 MD-FT

PERMEABILITY = (3,300 MD-FT) / 62 FT
= 54 MD

SLOPE = 25 PSI/CYCLE

BOTTOM HOLE PRESSURE (PSIG)

1000
900
800
700

1
10
100
1000

$\frac{T+\Delta T}{\Delta T}$

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
Oppel EXHIBIT NO. 7
CASE NO. 2857

EXHIBIT NO. 11

ECONOMICS OF 80-ACRE V. 40-ACRE SPACING
BOULDER-MANCOS POOL
RIO ARRIBA COUNTY, NEW MEXICO

Consider the 400 acres comprising the NW/4, S/2 of NE/4, E/2 of SW/4, and W/2 of SE/4 of Section 26 (outlined in red on Exhibit No. 2). This area has been developed with five wells on 80-acre spacing. The following comparison shows the economics of developing this acreage on 80-acre spacing (Case I) and the economics of developing the same area on 40-acre spacing (Case II):

Case I: 80-Acre Spacing

Assumptions

Development Costs: $394,091 (actual cost of the five wells)
Ultimate Recovery: 319,500 barrels (calculated from pressure decline)
Production Rate: Top Allowable 140 BOPD. Initial rate 143,445 barrels/year, declining 50% per year until reserves produced
Crude Price: $2.22/Barrel after trucking
Operating Cost: $10/Well-Day (maximum of five wells)

Case II: 40-Acre Spacing

Assumptions

Development Costs: $788,182 (twice the cost of 80-acre development)
Ultimate Recovery: 319,500 Barrels (same as 80-acre development)
Production Rate: Top Allowable 70 BOPD. Initial rate 123,187 barrels/year, declining 25% first year, 50% thereafter
Crude Price: $2.22/Barrel after trucking
Operating Cost: $10/Well-Day (maximum of 10 wells)

Resulting Economics (Calculations Attached)

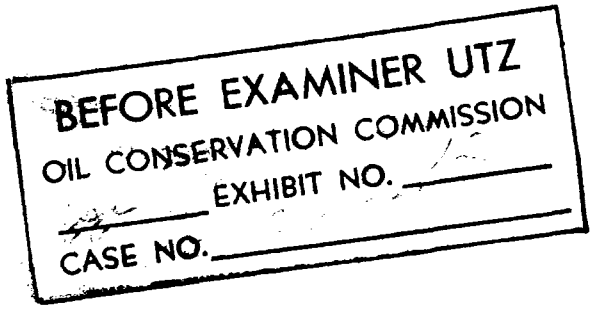
	Case I (80-Acre Spacing)	Case II (40-Acre Spacing)
Payout (Years)	2.183	None
Rate of Return (%)	38.119	None
Net Profit or (Loss)	$123,611	($122,624)
Net Investment	$225,647	$451,294
Profit-to-Investment Ratio	0.548	(0.272)

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. 7
CASE NO.

PRODUCTION TESTS

BOULDER-MANCOS POOL

Well	Test Date	Production (24 Hr.)
Jicarilla 4-26 No. 2	6-20-63	143 BO, 0 BW
Jicarilla 4-26 No. 3	6-21-63	145 BO, 0 BW
Jicarilla 4-26 No. 4	6-18-63	151 BO, 5 BW



PROPOSED RULES
BOULDER-MANCOS POOL
RIO ARRIBA COUNTY, NEW MEXICO

RULE 1. Each well completed in the Boulder-Mancos Pool or in the Mancos formation within one mile of the Boulder-Mancos Pool and not nearer to nor within the limits of another designated Mancos pool shall be spaced, drilled, operated, and prorated in accordance with the rules hereinafter set forth.

RULE 2. Each well completed or recompleted in the Boulder-Mancos Pool shall be located on a unit containing 80 acres, more or less, which consists of any two contiguous quarter-quarter sections of a single governmental quarter section; provided, however, that nothing contained herein shall be construed as prohibiting the drilling of a well on each of the quarter-quarter sections in the unit.

RULE 3. All wells projected to or completed in the Boulder-Mancos Pool shall be located within 200 feet of the center of either quarter-quarter section in the unit.

RULE 4. For good cause shown, the Secretary-Director may grant an exception to Rule 2 without notice and hearing where an application has been filed in due form and where:

1. The non-standard unit consists of a single quarter-quarter section or lot.
2. The non-standard unit may be reasonably presumed productive.
3. The applicant presents waivers from all offset operators, or proof of notification of offset operators (in which case 20 days delay required).

RULE 5. For topographic reasons, the Secretary-Director may grant an exception to Rule 3 without notice and hearing upon presentation of waivers or proof of notification (after 20 days delay).

RULE 6. The allowable assigned to any non-standard proration unit shall bear the same ratio to a standard allowable in the Boulder-Mancos Pool as the acreage in the non-standard unit bears to 80 acres.

RULE 7. An 80-acre proration unit (79 through 81 acres) shall be assigned an 80-acre proportional factor of 2.0 for allowable purposes, and in the event there is more than one well on an 80-acre proration unit, the operator may produce the allowable assigned to the unit from said wells in any proportion.

RULE 8. All wells completed in or drilling to the Boulder-Mancos Pool at the time this order becomes effective are hereby granted exception to Rule 3.

BEFORE EXAMINER UTZ
OIL CONSERVATION COMMISSION
EXHIBIT NO. _____
CASE NO. _____

PRODUCTION TESTS

BOULDER-MANCOS POOL

Well	Test Date	Production (24 Hr.)
Jicarilla 4-26 No. 2	6-20-63	143 BO, 0 BW
Jicarilla 4-26 No. 3	6-21-63	145 BO, 0 BW
Jicarilla 4-26 No. 4	6-18-63	151 BO, 5½BW

EXHIBIT NO. 11

ECONOMICS OF 80-ACRE V. 40-ACRE SPACING
BOULDER-MANCOS POOL
RIO ARRIBA COUNTY, NEW MEXICO

Consider the 400 acres comprising the NW/4, S/2 of NE/4, E/2 of SW/4, and W/2 of SE/4 of Section 26 (outlined in red on Exhibit No. 2). This area has been developed with five wells on 80-acre spacing. The following comparison shows the economics of developing this acreage on 80-acre spacing (Case I) and the economics of developing the same area on 40-acre spacing (Case II):

Case I: 80-Acre Spacing

Assumptions

Development Costs: $394,091 (actual cost of the five wells)
Ultimate Recovery: 319,500 barrels (calculated from pressure decline)
Production Rate: Top Allowable 140 BOPD. Initial rate 143,445 barrels/year, declining 50% per year until reserves produced
Crude Price: $2.22/Barrel after trucking
Operating Cost: $10/Well-Day (maximum of five wells)

Case II: 40-Acre Spacing

Assumptions

Development Costs: $788,182 (twice the cost of 80-acre development)
Ultimate Recovery: 319,500 Barrels (same as 80-acre development)
Production Rate: Top Allowable 70 BOPD. Initial rate 123,187 barrels/year, declining 25% first year, 50% thereafter
Crude Price: $2.22/Barrel after trucking
Operating Cost: $10/Well-Day (maximum of 10 wells)

Resulting Economics (Calculations Attached)

	Case I (80-Acre Spacing)	Case II (40-Acre Spacing)
Payout (Years)	2.183	None
Rate of Return (%)	38.119	None
Net Profit or (Loss)	$123,611	($122,624)
Net Investment	$225,647	$451,294
Profit-to-Investment Ratio	0.548	(0.272)