CORE LABORATORIES, INC. *Petroleum Reservoir Engineering*

COMPANY TESORO PETROLEUM CORPORATION FIELD SOUTH HOSPAH FILE RP-3-2327

WELL WALKER-SANTA FE NO. 16 COUNTY MC KINLEY DATE 10-31-68

LOCATION 330'FNL & 610'FWL SEC 7-T17N-R8W STATE NEW MEXICO ELEV. 6913'GL

CORE-GAMMA CORRELATION

VERTICAL SCALE: 5" = 100'

CORE-GAMMA SURFACE LOG
(PATENT APPLIED FOR)

GAMMA RAY
RADIATION INCREASE →

COREGRAPH

TOTAL WATER
PERCENT TOTAL WATER
80 60 40 20 0

PERMEABILITY
MILLIDARCYS
100 50 10 5 1

POROSITY
PERCENT
20 10 0

OIL SATURATION
PERCENT PORE SPACE
0 20 40 60 80

2460
2500
2550
2600
2650
2710

CORE SUMMARY AND CALCULATED RECOVERABLE OIL

FORMATION NAME AND DEPTH INTERVAL: Dakota - 2516.0 to 2536.0 feet

FEET OF CORE RECOVERED FROM ABOVE INTERVAL	20	AVERAGE TOTAL WATER SATURATION: PER CENT OF PORE SPACE	54.0
FEET OF CORE INCLUDED IN AVERAGES	18	AVERAGE CONNATE WATER SATURATION: PER CENT OF PORE SPACE	43 (c)
AVERAGE PERMEABILITY: MILLIDARCYS	4.5	OIL GRAVITY, °API	
PRODUCTIVE CAPACITY MILLIDARCY-FEET	81.3	ORIGINAL SOLUTION GAS-OIL RATIO: CUBIC FEET PER BARREL	
AVERAGE POROSITY, PER CENT	21.7	ORIGINAL FORMATION VOLUME FACTOR: BARRELS SATURATED OIL PER BARREL STOCK-TANK OIL	
AVERAGE RESIDUAL OIL SATURATION PER CENT OF PORE SPACE	2.9	CALCULATED ORIGINAL STOCK-TANK OIL IN PLACE: BARRELS PER ACRE-FOOT	

Calculated maximum solution gas drive recovery is barrels per acre-foot, assuming production could be continued until reservoir pressure declined to zero psig. Calculated maximum water drive recovery is [illegible] assuming [illegible] reservoir pressure [illegible], areal and vertical coverage and continuation of productivity to [illegible] water cut. [illegible] for further discussion of recovery estimates.

[illegible] Mesaverde [illegible] Report attached [illegible]

INTERPRETATION OF DATA

2511.0 to 2516.0 feet - Essentially non-productive.
2516.0 to 2536.0 feet - Gas productive where permeable.
2536.0 to 2580.0 feet - Water productive, however, production would be limited due to low permeability and porosity.
2580.0 to 2594.0 feet - Water productive
2594.0 to 2665.0 feet - Water productive, but lower porosity and permeability indicate limited production.
2660.0 to 2693.0 feet - Water productive.

These recovery estimates represent theoretical maximum values for solution gas and water drive. They assume that production is started at original reservoir pressures; i.e., no account is taken of production to date or of prior drainage to other areas. The effects of factors tending to reduce actual ultimate recovery, such as economic limits on oil production rates, gas-oil ratios, or water-oil ratios, have not been taken into account. Neither have factors been considered which may result in actual recovery intermediate between solution gas and complete water drive recoveries, such as gas cap expansion, gravity drainage, or partial water drive. Detailed projections of ultimate oil recovery to specific abandonment conditions may be made in an engineering study in which consideration is given to all detail reservoir characteristics and economic factors.