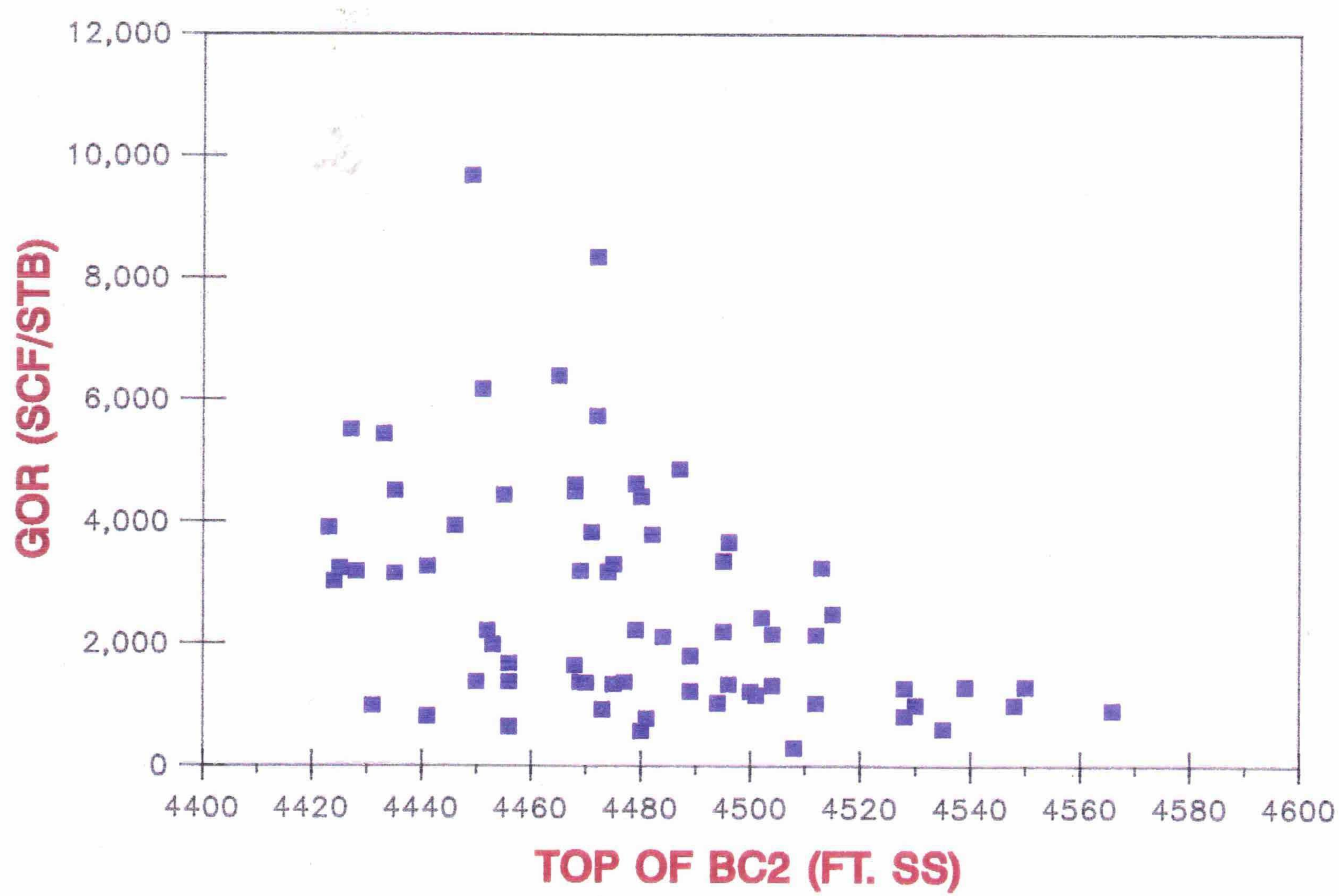
CURRENT GOR vs STRUCTURE

Sand Dunes West/Los Medanos



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PRODUCTION CONTRIBUTION FROM OTHER ZONES
SAND DUNES WEST / LOS MEDANOS FIELDS

Brushy Canyon/Cherry Canyon

	% Brushy	% Cherry
Mobil Federal #7 (Sec. 29)	49	51
Poker Lake 32 St. #3 (Sec. 32)	22	78
Poker Lake 32 St. #4 (Sec. 32)	16	84

(Data based on producing rates before and after combining zones.)

Brushy Canyon/U. Bone Springs

	% Brushy	% Bone
Pauline ALB St. #6 (Sec. 32)	94	6

(Data based on Yates testimony for commingling order.)

Brushy Canyon/Bell Canyon

	% Brushy	% Bell
Medano VA St. #1 (Sec. 16)	--	--
Medano VA St. #3 (Sec. 16)	--	--

(No data available on contribution from each zone. Do not know if Bell Canyon was tested separately from Brushy Canyon.)

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"Many studies indicate that the recovery from true solution gas–drive reservoirs by primary depletion is essentially independent of both individual well rates and total or reservoir production rates".

"The failure to reduce the gas–oil ratios is typical of the dissolved gas drive mechanism, because when the critical gas saturation is reached, the gas–oil ratio is a function of the decline in reservoir pressure or depletion, and is not materially changed by production rate or completion methods".

"Rate sensitive reservoirs imply that there is some mechanism(s) at work in the reservoir, which, in a practical period of time, can substantially improve the recovery of the oil in place. These mechanisms include partial water drive, and gravitational segregation".

After Craft & Hawkins, "Applied Petroleum Reservoir Engineering",
pp. 120, 197.

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Equation for Instantaneous GOR for a Solution - Gas Drive Reservoir

$$R = R_s + \frac{k_g}{k_o} \frac{\mu_o}{\mu_g} \frac{B_o}{B_g}$$

WHERE:

R	=	Instantaneous producing gas-oil ratio, scf/stb.
R_s	=	Solution gas-oil ratio, scf/stb.
k_g	=	Effective permeability to gas, md.
k_o	=	Effective permeability to oil, md.
μ_o	=	Oil viscosity, cp.
μ_g	=	Gas viscosity, cp.
B_o	=	Oil formation volume factor, bbl/scf.
B_g	=	Gas formation volume factor, bbl/scf.

After H.C. Slider, "Practical Petroleum Reservoir Engineering Methods". p. 340, eqn. 6.24.

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EXHIBIT # 22

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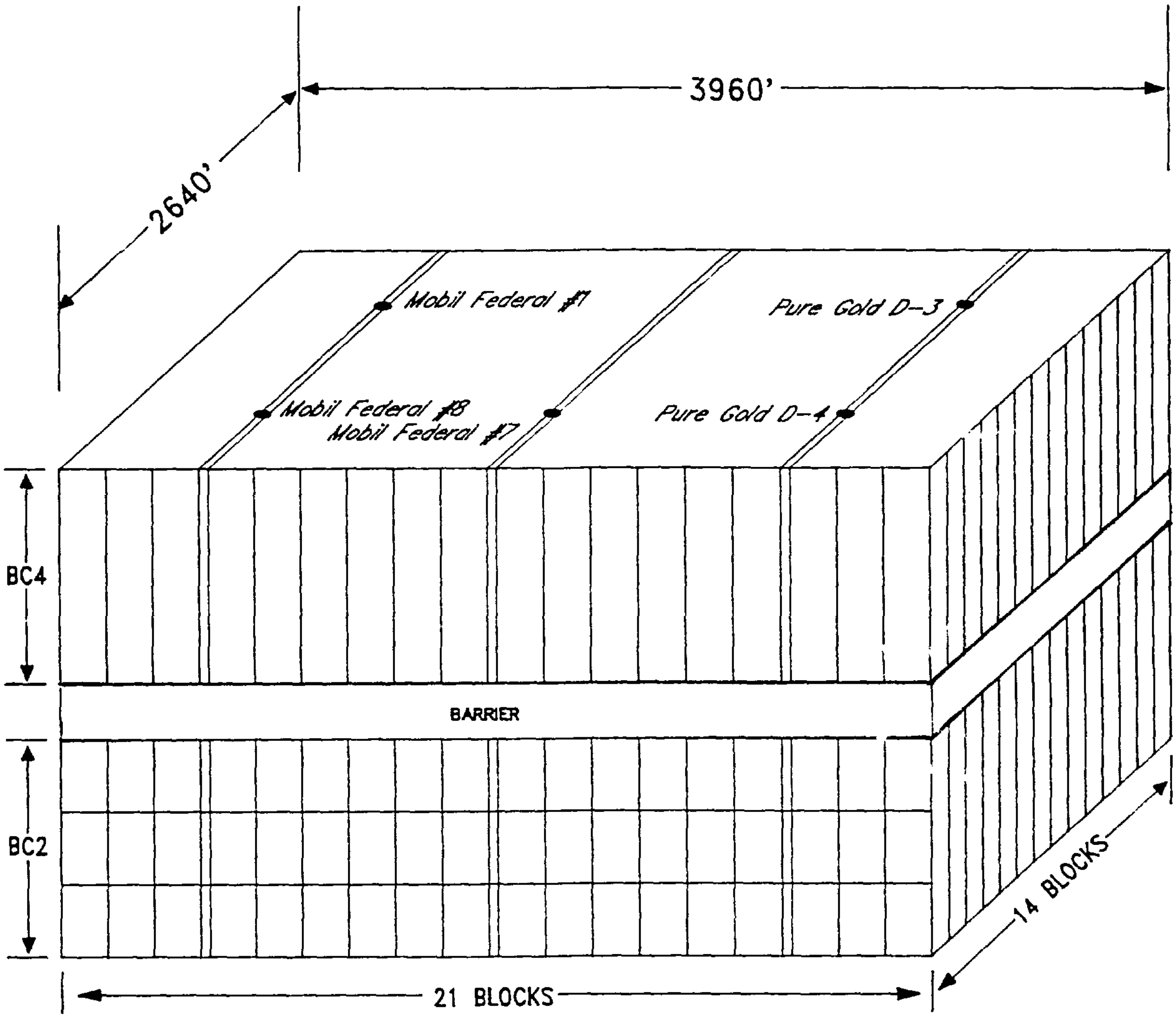
Pogo EXHIBIT 23

CASE NO. 10870



240-ACRE
FIVE WELL
RESERVOIR MODEL
SAND DUNES, WEST (BRUSHY CANYON) FIELD
EDDY COUNTY, NEW MEXICO

SAND DUNES, WEST (DELAWARE)
Reservoir Simulation Input

Reservoir Pressure, psia	3300
Bubble Point Pressure, psia	3173
Rock Compressibility, l/psi	4.3×10^{-6}
Oil Formation Volume Factor, RB/STB	1.570
Oil Gravity, °API	44.1°
Gas Gravity	0.774
Water Density, lb/ft^3	71.14

	BC4	BC2
Average Porosity, %	14	14
Average Permeability, md	2.70	1.60
Irreducible Water Saturation, %	31.5	31.5
Residual Oil Saturation, %	18	18
Critical Gas Saturation, %	7	7
Initial Solution GOR, SCF/STB	1130	1130

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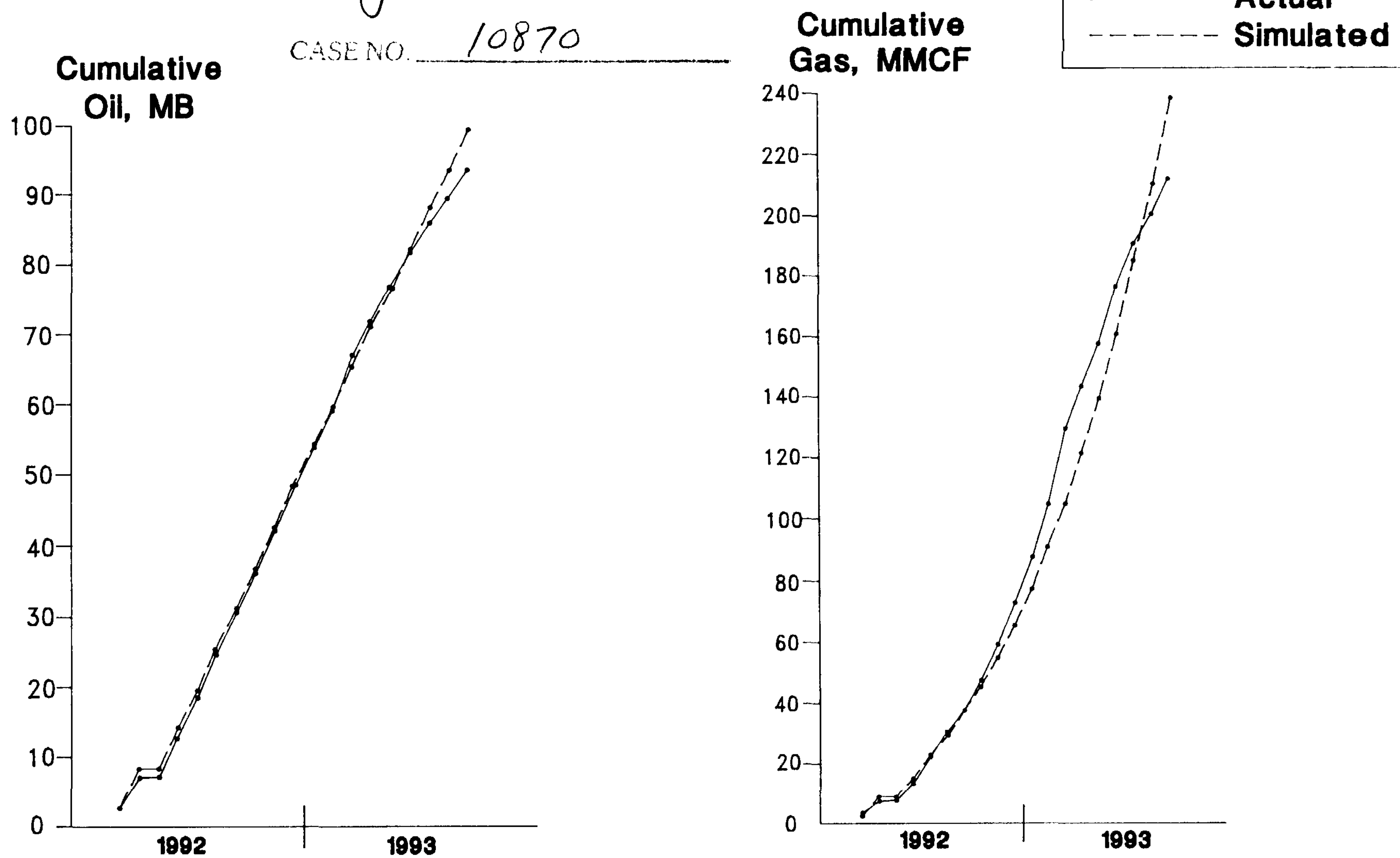
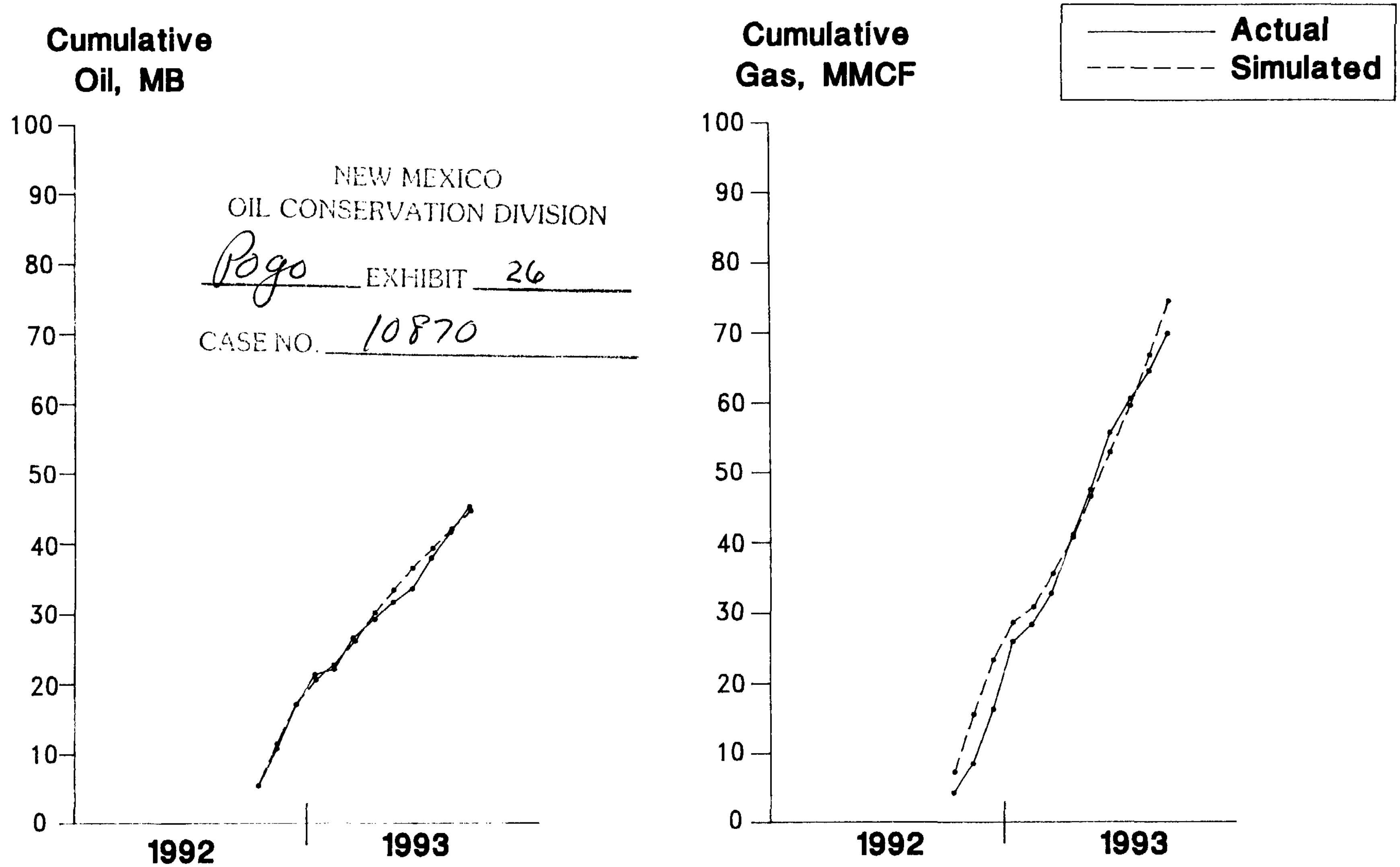


MOBIL FEDERAL #1
Sand Dunes, West (Delaware) Field
Eddy County, New Mexico



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MOBIL FEDERAL #7

Sand Dunes, West (Delaware) Field
Eddy County, New Mexico

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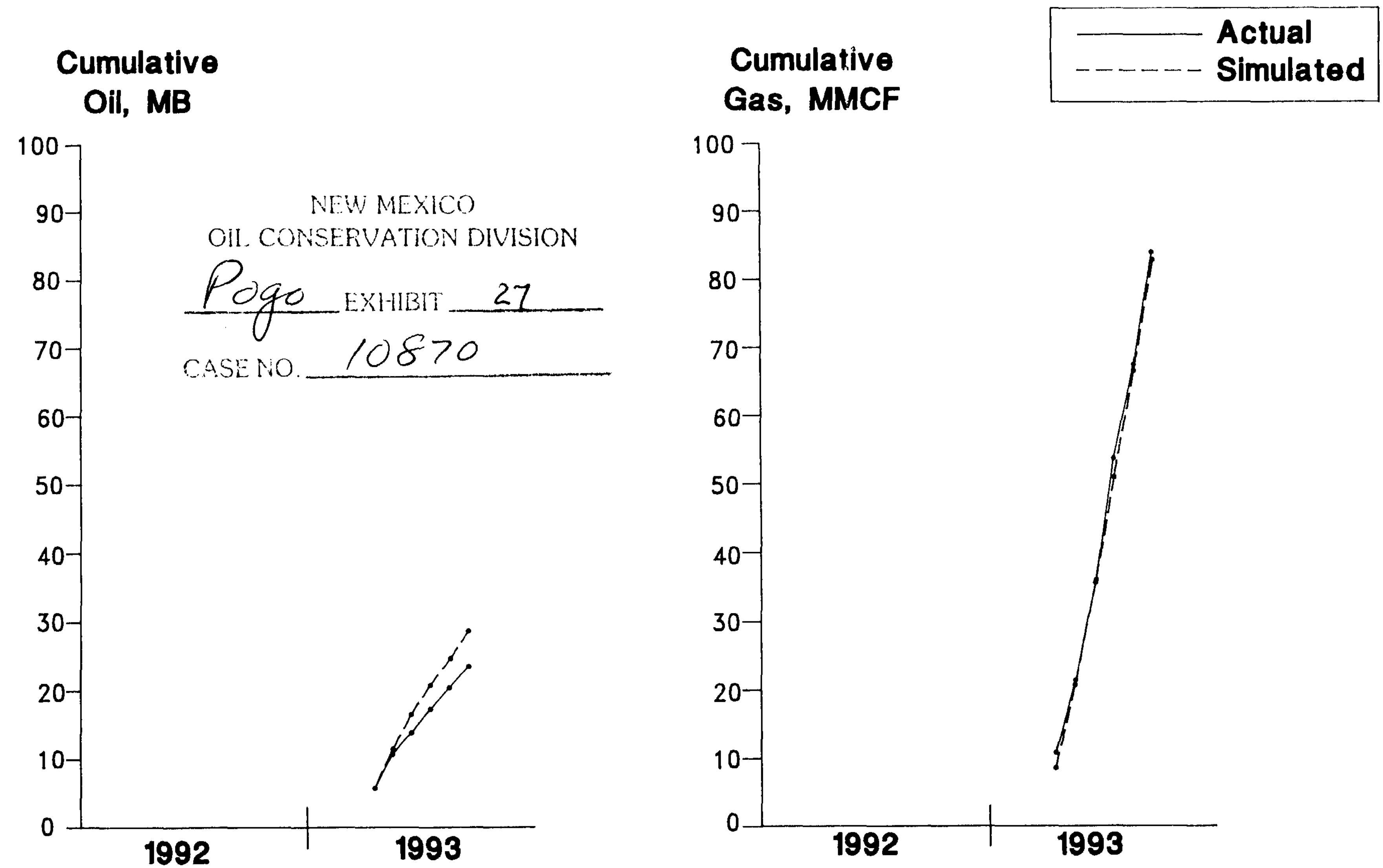
Pogo EXHIBIT 27
CASE NO. 10870



MOBIL FEDERAL #8
Sand Dunes, West (Delaware) Field
Eddy County, New Mexico

NEW MEXICO
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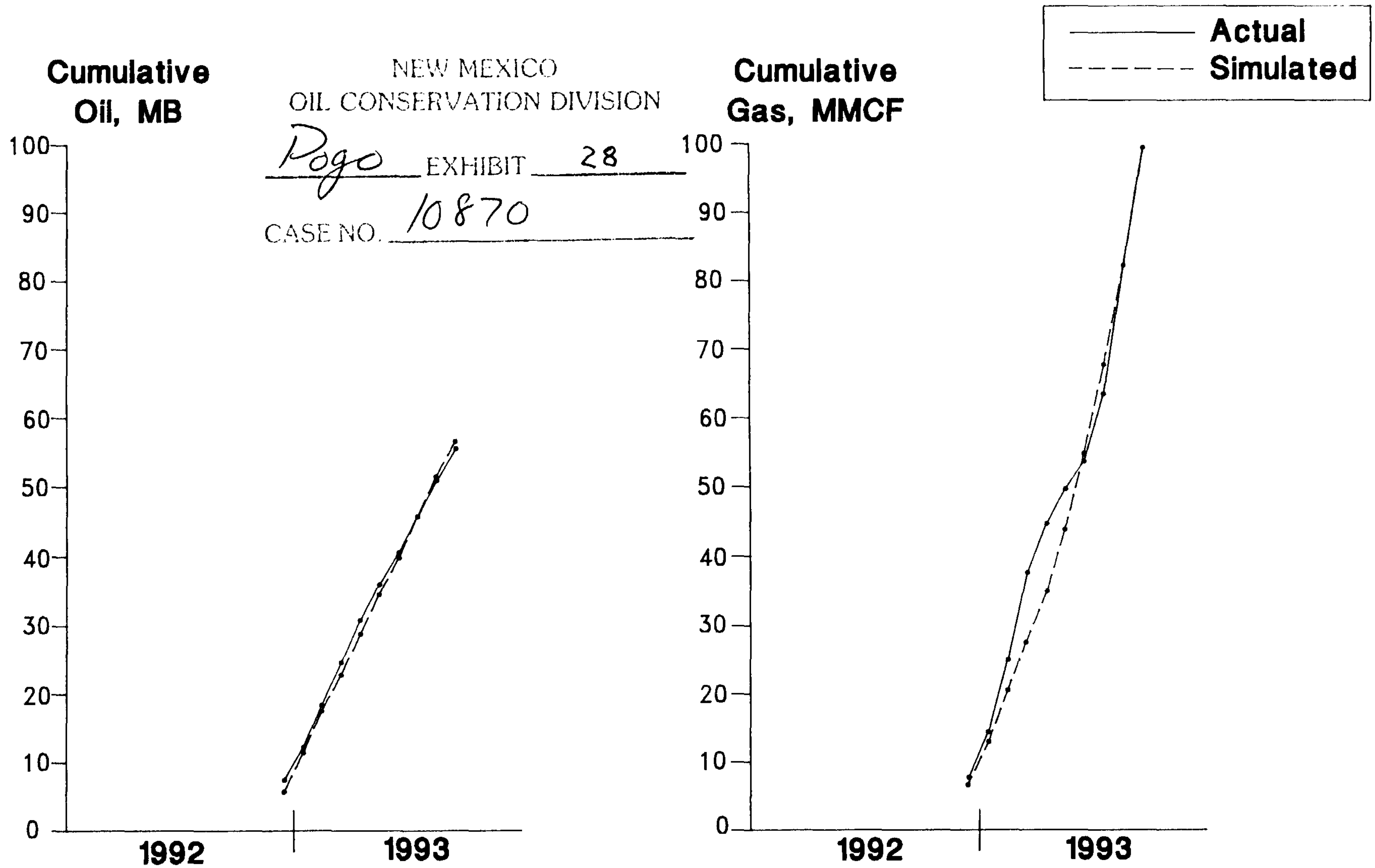
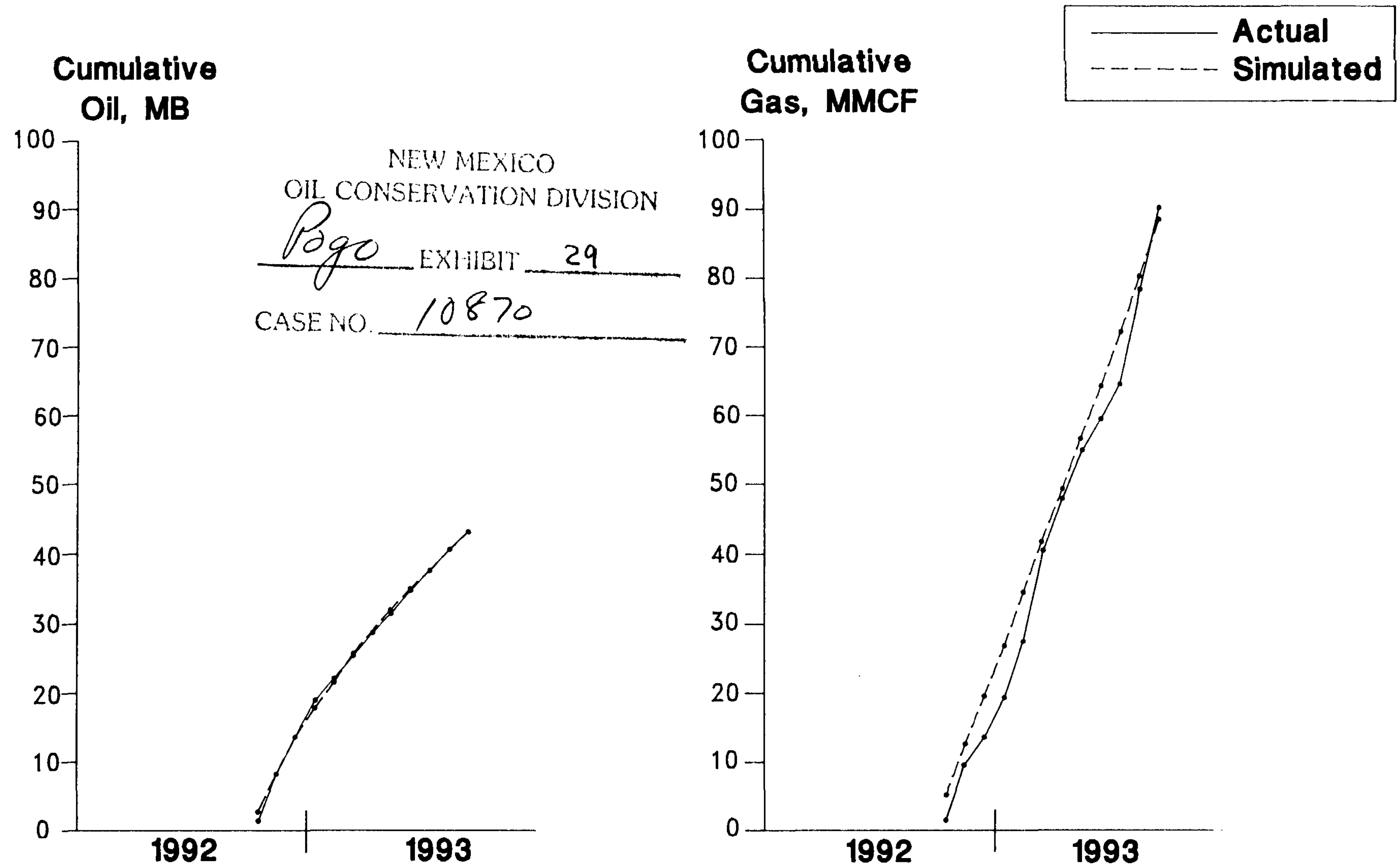
Pogo EXHIBIT 28
CASE NO. 10870



PURE GOLD D-3
Sand Dunes, West (Delaware) Field
Eddy County, New Mexico



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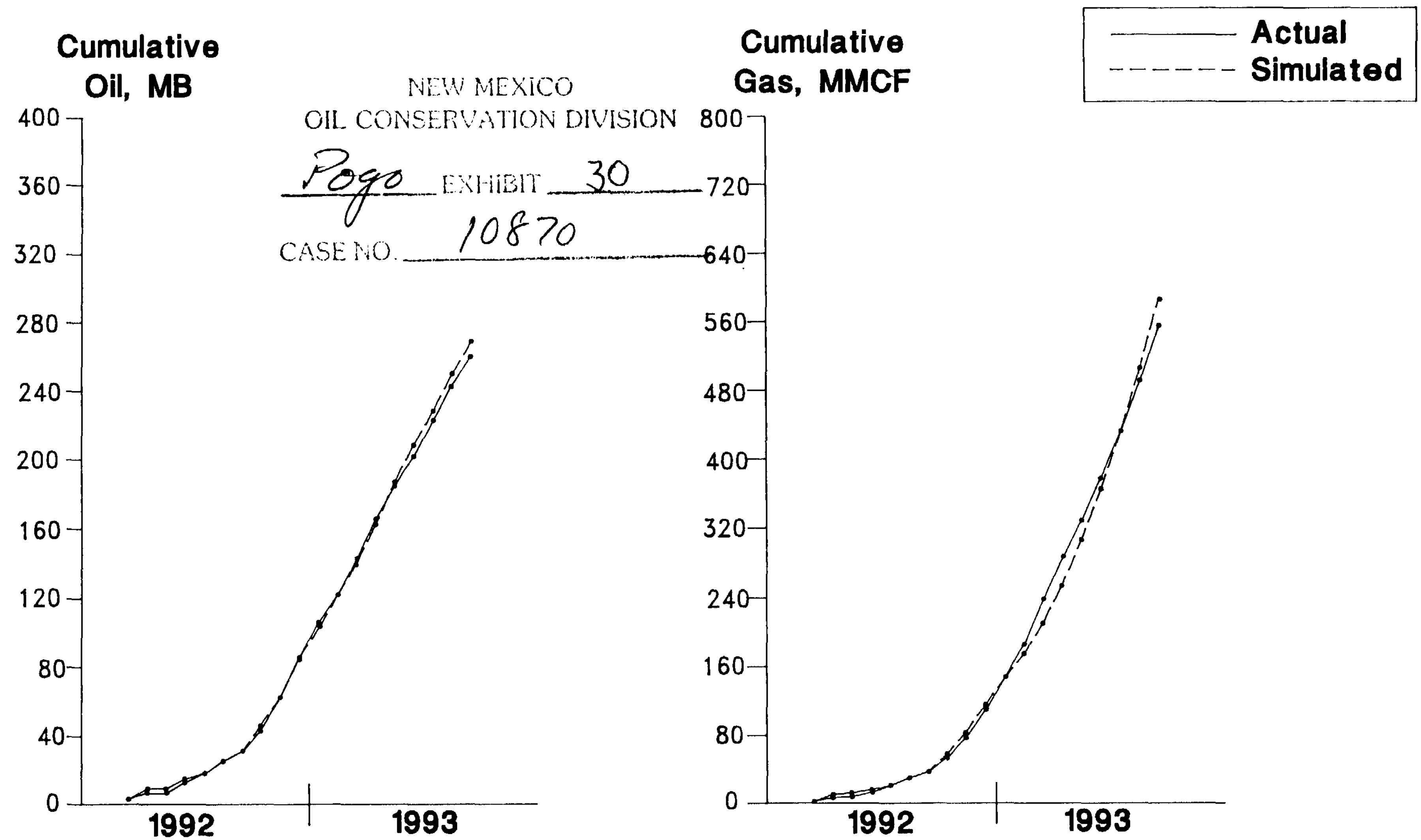
PURE GOLD D-4
Sand Dunes, West (Delaware) Field
Eddy County, New Mexico



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CASE NO. 10870

FIVE WELL AREA

Sand Dunes, West (Delaware) Field
Eddy County, New Mexico

SIMULATION RESULTS
Five Well Area
Sand Dunes, West (Delaware) Field
Eddy County, New Mexico

GOR Allowable	2000:1	8000:1
(Economic) Production Limit, STB/D/Well	10	10
Oil Recovery, MB	605	594
Gas Recovery, MMCF	4,003	4,036
Cumulative GOR, SCF/STB	6,615	6,795
Oil Recovery Factor, %	11.19	10.99

NEW MEXICO
OIL CONSERVATION DIVISION
Pogo EXHIBIT 31
CASE NO. 10870

RESERVES AND ECONOMIC COMPARISON
FOR 5-WELL MODEL AREA
AT 2000:1 AND 8000:1 GOR ALLOWABLES

	2000:1 GOR	8000:1 GOR
Oil Recovery Factor, %	11.19	10.99
Cumulative Gas-Oil Ratio, SCF/STB	6,615	6,795
Ultimate Oil Recovery, MSTB	605	594
Ultimate Gas Recovery, MMCF	4,003	4,036
Total Life, yrs.	10.3	8.3
Total Operating Costs, $M	1,701	1,470
Net Present Value @ 15% (After tax), $M	5,457	5,795

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NEW MEXICO OIL CONSERVATION DIVISION

CASE NO. 10870

EXHIBIT # 32