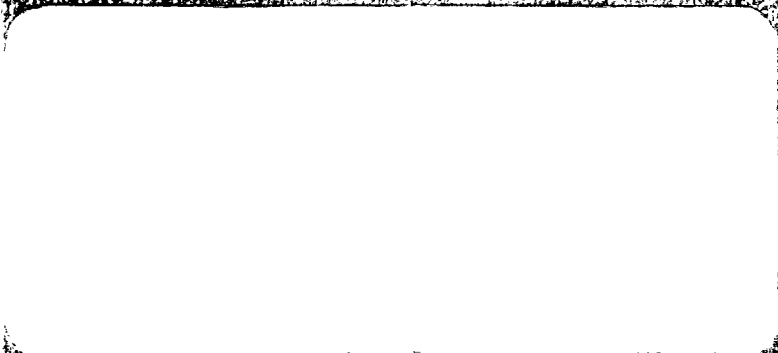




COLUMBIA GAS
Development



**DOCKET #7-93
CASE #10669
OIL CONSERVATION DIVISION
DEPARTMENT OF ENERGY, MINERALS,
AND NATURAL RESOURCES
Application of Columbia Gas Development Corporation
for Pool Creation, Special Pool Rules,
and A Discovery Allowable
Lea County, New Mexico
McMillan #34-1**

R 38 E

Case No. 10669

Exhibit No. 1

T
14
S
WARREN PET. CORP.
11a Cox
1 -5713'
13,375'

21

22

23

24

14

S

28

27

26

25

14

S

LEA COUNTY, NEW MEXICO
YOAKUM COUNTY, TEXAS

CGDC
Cave Est.
1
9850' -5607'

CGDC
Mc Millan
34-1
11,900' -5564'

GREATHOUSE, PIERCE & DAVIS
Ester McClure Barnes
1
13,036' -5638'

READING & BATES PET.
Dickenson Cattle
2
9619' -5632'
1
13,360' -5608'
3
9582' -5675'

MC BEE OIL CO.
Moreman
1
-5604'
13,023'

R 38 E

COLUMBIA GAS
Development

EAST DENTON
LEA COUNTY, NEW MEXICO

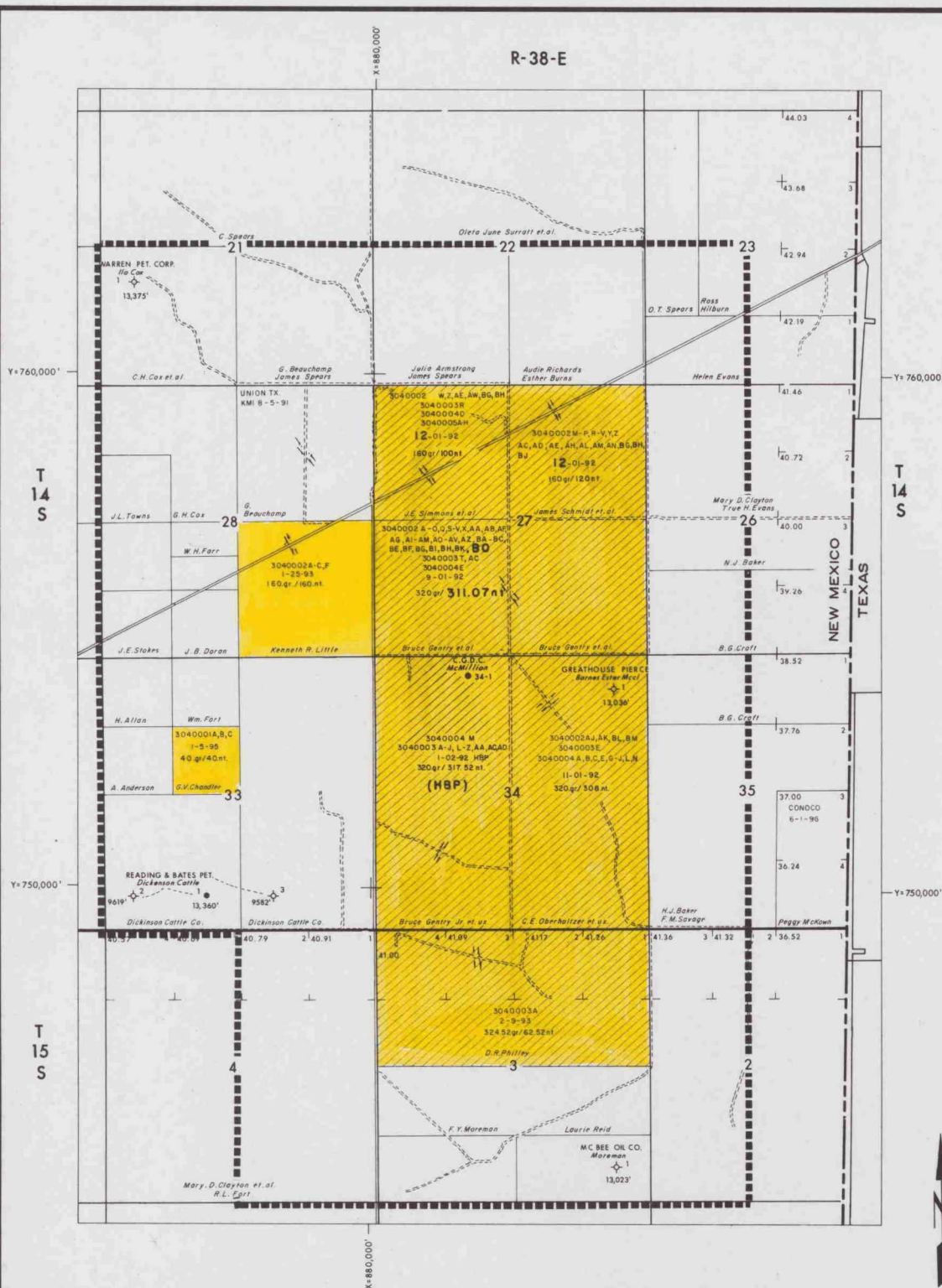
Structure
TOP U. WOLFCAMP POROSITY
..... SEISMIC CONTROL

1000' 500' 0 1000' 2000' 3000'

INTERP. BY: SPRAIN, METZ
C.L.: 25'

DATE: 10-92
DRAFTED BY: SMS

R-38-E



REVISIONS	
REVISED BY	DATE
R.G.S.	9-21-92
C.J.D.	10-10-91
C.J.D.	10-05-91
C.J.D.	1-21-92
C.J.D.	2-14-92
C.J.D.	2-18-92
R.G.S.	4-21-92
R.G.S.	4-23-92
C.J.D.	6-04-92

- AREA OF MUTUAL INTEREST
- 100% C.G.D.C.
- Less than 100% C.G.D.C.

COLUMBIA GAS
Development

EAST DENTON
LEA COUNTY, NEW MEXICO

1000' 0 1000' 2000' 3000'

DRAFTED BY: R.G.S. DATE: 2-21-91 SCALE: 1" = 1000'

(LAND: M. Wardenhall) LOCATION: 2817

SHEET: 1 OF 1 CONTRACT NO. 304

Case No. 10669

Exhibit No. 2



ATLAS
WIRELINE
SERVICES

COMPENSATED Z-DENSILOG
COMPENSATED NEUTRON
GAMMA RAY X-Y CALIPER

FILE NO.

API NO.

COMPANY COLUMBIA GAS DEVELOPMENT CORP.

WELL MCMILLAN NO. 34-1

FIELD WILDCAT

COUNTY LEA STATE NEW MEXICO

LOCATION:

400' FNL & 1980' FML

OTHER SERVICES

DIFL-GR-CAL
LS BHC/AL-GR
ML-GR-CAL
DIPLOG, DELS

PERMANENT DATUM GROUND LEVEL

ELEVATION 3768 FT.

ELEVATIONS

LOGS MEASURED FROM KELLY BUSHING 19.8 FT. ABOVE PERMANENT DATUM
ALL MEAS. FROM KELLY BUSHING

KB 3779.8
DF 3778.8
GL 3760.0

DATE 11 FEBRUARY 1992

WELL NO. ONE

WELL ORDER 94924

DEPTH DRILLER 11900

DEPTH LOGGER NOT LOGGED

WELL LOGGED INTERVAL 11876

WELL LOGGED INTERVAL SURFACE

CASING - DRILLER 8 5/8" @4900

CASING LOGGER 4895

CASING LOGGER 7 7/8"

TYPE FLUID IN HOLE LSND

TEMPERATURE / VISCOSITY 9.0 45

TEMPERATURE / FLUID LOSS 9.5 8.2

SOURCE OF SAMPLE CIRCULATION TANK

AT MEAS. TEMP. 0.56 @71 DEG.F

AT MEAS. TEMP. 0.32 @81 DEG.F

AT MEAS. TEMP. 0.53 @79 DEG.F

SOURCE OF RMT / RMC MEASURED MEASURED

AT BHT 0.276 @151 DEG.F

ME SINCE CIRCULATION 14 HOURS

MAX. REC. TEMP. DEG. F 151 DEG. F

WELL NO. / LOCATION HL 6364 HOBBS, NM

RECORDED BY RAIL / JOKES

WITNESSED BY ROGER ALLEN

FOLD HERE

09300

09400

Top Upper Wolfcamp

Top Wolfcamp Porosity

9336' (-5556)

9344' (-5564)

2 Jet Shots per foot
9345' - 9468' OA

ENGINEERING EXHIBIT

McMILLAN #34-1
WOLFCAMP FORMATION

Gas Composition

<u>Component</u>	<u>Mol %</u>
C ₁ - Methane	54.94
C ₂ - Ethane	13.08
C ₃ - Propane	13.27
iC ₄ - Isobutane	2.75
nC ₄ - n-Butane	6.70
iC ₅ - i-Pentane	2.07
nC ₅ - n-Pentane	2.00
C ₆ + - n-Hexanes	2.68
CO ₂ - Carbon Dioxide	0.00
N ₂ - Nitrogen	2.51
H ₂ S - Hydrogen Sulfide	<u>0.00</u>
Total	100.00

Calculated Specific Gravity = 1.037 (Air = 1.0)

Calculated Gross BTU/Cu.Ft. = 1,726 (saturated) 1,757 Dry
@ 15.025 psi, 60° F

Case No. 10669
Exhibit No. 4

ENGINEERING EXHIBIT

**McMILLAN #34-1
WOLFCAMP FORMATION**

Reservoir Properties

Initial reservoir pressure (DST)	3,808 psi
Bubble point pressure (correl.)	716 psi
Reservoir temperature	140° F
Reservoir drive mechanism (assumed)	Pressure Depletion
Average water saturation (logs)	33%
Average porosity (logs)	6%
Net pay (logs)	31 ft.
Effective permeability (DST Horner plot)	7.9 Md
Formation volume factor (correl.)	1.15
Oil gravity	40° API
Gas gravity	1.037
Gas-oil ratio	57 CF/BO
Current 24-hour rate - oil	70 BOPD
Current 24-hour rate - gas	4 MCFPD
Current 24-hour rate - water	1 BWPD
Cumulative oil production through 02/01/93	32 MBO
Fluid disposition - oil	Sold to Koch
Fluid disposition - gas	Flared
Fluid disposition - water	Trucked
Estimated effective drainage (decline)	160 acres
Estimated recoverable reserves (decline)	124 MBO

ENGINEERING EXHIBIT

McMILLAN #34-1 WOLFCAMP FORMATION

Volumetric Reserves and Recovery Estimates

Volumetric Reserve Estimate (OOIP)

$$N = \frac{7758 \times \phi \times (1 - S_w) \times h}{B_o} \text{ (Barrels per ac.)}$$

Where: Porosity, ϕ = 6%
Water saturation, S_w = 33%
Average Net Pay (h) = 22 ft.
Area, A = 160 acres
Oil formation volume factor, B_o = 1.15

$$N = 5,966 \frac{B_o}{ac}$$

$$OOIP = \frac{B_o}{ac} \times ac$$

$$OOIP = 5,966 \times 160$$
$$OOIP = 954,598 \text{ BO}$$

Estimated Ultimate Oil Recovery (EUR)

EUR = Cumulative Production + Remaining Reserves

$$\text{Remaining Reserves} = \frac{(q - q_{el}) 365}{\ln(1 - dy)} \text{ (Exponential Decline Curve)}$$

Where: Production Rate (q) = 70 BOPD
Economic Limit (q_{el}) = 10 BOPD
Decline Rate (dy) = 21%
Cumulative Production (02/93) = 32,000 BO

$$\text{Remaining Reserves} = \frac{(70 - 10) 365}{\ln(1 - 0.21)} = 92,000 \text{ BO}$$

$$EUR = 32,000 + 92,000 = 124,000 \text{ BO}$$

Recovery Factor (RF)

$$RF = \frac{EUR}{OOIP} = \frac{124,000}{954,598}$$

$$RF = 13\% \text{ (160 acres)}$$

Case No. 10669
Exhibit No. 6

ENGINEERING EXHIBIT

McMILLAN #34-1 WOLFCAMP FORMATION

Wolfcamp Formation Economics

A. Investment

Drill and Complete, \$	988,000
Facilities, \$	90,000
Pumping Unit Installation, \$	<u>110,000</u>
Total	\$1,188,000

B. Operating Cost

Dollars per month	4,000
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C. Reserves and Rate

Initial Production Rate, BOPD	215
Reserves, BO	124,000

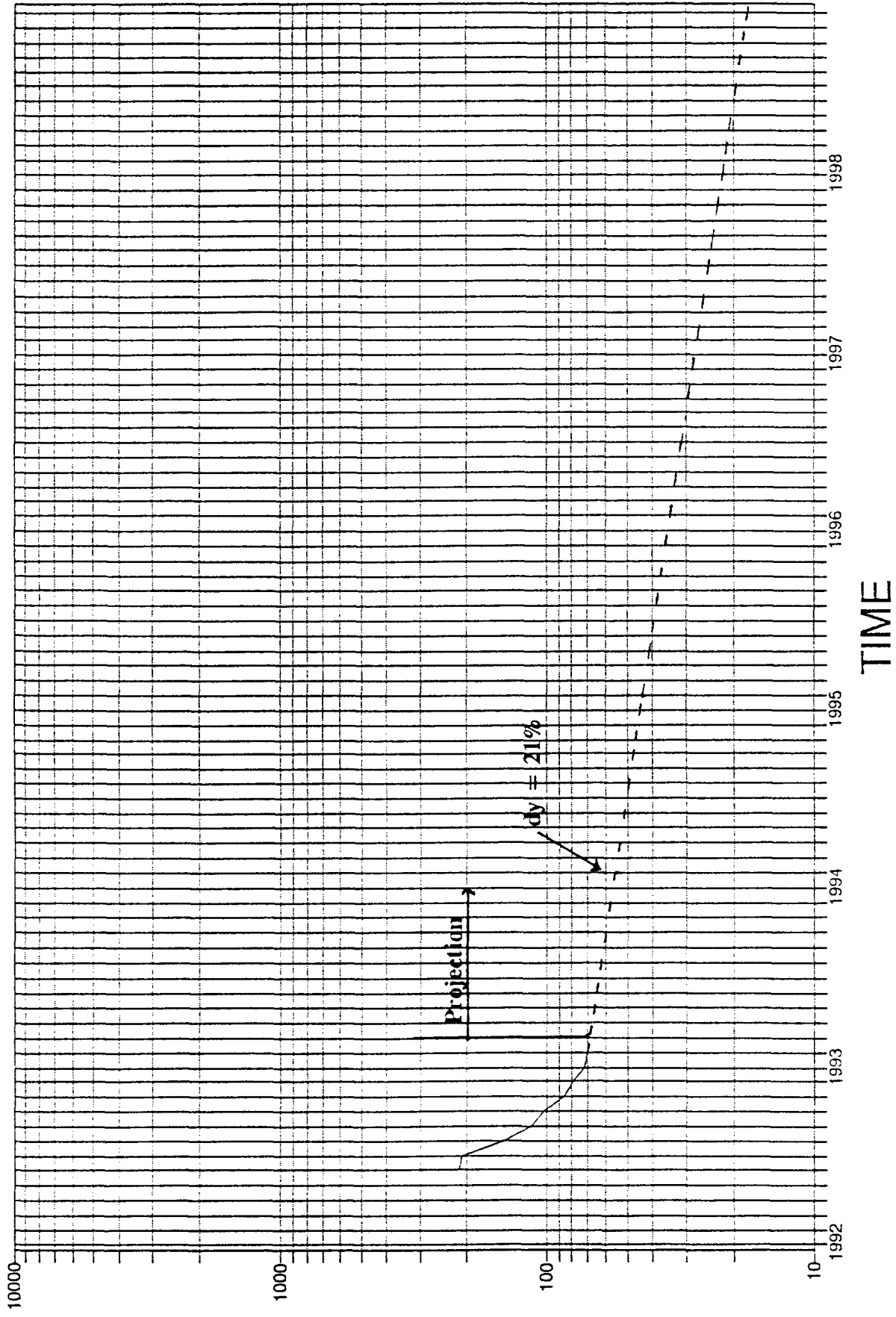
D. Economics

Initial Oil Price, \$/BO	20.75
Payout, years	4.6
Cash Flow After Federal Tax, \$	340,000
Rate of Return, %	11.9

COMPLETION DATE: 5-29-92
IP: 227 BOPD

MCMILLAN #34-1
LEA COUNTY, NEW MEXICO

DATE SPUDDED: 12-30-92
DATE TD REACHED: 2-10-92



— BOPD