Reservoir Fluid Study

for

Home Oil Company Limited

Home Scurry S Pierson 6-19-2-29 (W1M)

South Pierson Field, Manitoba

File: 55377-87-258

Date: 1987 11 17

Litton

Core Lab

Core Laboratories Canada, Ltd.
1540 - 25th Avenue N.E.
Calgary, Alberta
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1987 11 17

Home Oil Company Limited
2300, 324 - Eighth Avenue S.W.
Calgary, Alberta
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Attention: Mr. Jik Chan

Subject: Reservoir Fluid Study
Home Scurry S Pierson 6-19-2-29 (W1M)
South Pierson Field, Manitoba
File Number: 55377-87-258

Gentlemen:

Samples of treater gas and oil were collected from the subject well on 1987 08 28 by a representative of Core Laboratories. The samples were then submitted to our Calgary laboratory for analysis.

Initially, the treater samples were physically recombined to the specified gas-oil ratio of 44.44 m^3/m^3 stock tank liquid. A portion of the recombined reservoir fluid was transferred, under pressure, to a high pressure, windowed cell and heated to the reported reservoir temperature of 42.0°C. The pressure-volume relations and the differential pressure depletion relations of the fluid were determined at this temperature. The viscosity of the fluid was also measured at the reservoir temperature for pressures exceeding the saturation pressure to atmospheric pressure. A two-stage separator test was then conducted, using a primary pressure of 131 kPa (gauge) at 54.4°C.

The solution gas-oil ratios and formation volume factor generated from this separator test have been adjusted using data from the pressure-volume relations test and the differential vaporization test.

The composition of the recombined reservoir fluid was determined by low temperature, fractional distillation.

Thank you for the opportunity to be of service. Please contact us if you have any questions concerning the enclosed data.

Yours truly,

CORE LABORATORIES

Tom B. Martin
Supervisor
Reservoir Fluids Laboratory

TC:lr
enclosures

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SECTION I

Tabular Data

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VOLUMETRIC DATA OF RESERVOIR FLUID SAMPLE

1. Saturation pressure (P_s) (bubble point) 4551 kPa (gauge) at 42.0 °C.

2. Thermal expansion (β_o) of reservoir fluid: Volume @ 42.0°C:
   Volume @ 22.2°C

   At 34474 kPa (Gauge) = 1.01732

3. Compressibility (C_o) of reservoir fluid @ reservoir temperature: Vol/Vol/kPa:

   From 34474 kPa to 27579 kPa = 8.66×10^{-6}

   From 27579 kPa to 20684 kPa = 9.06×10^{-6}

   From 20684 kPa to 13790 kPa = 10.03×10^{-6}

   From 13790 kPa to 6895 kPa = 10.83×10^{-6}

   From 6895 kPa to 4551 kPa = 11.98×10^{-6}

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PRESSURE VOLUME RELATIONS AT 42.0°C

	PRESSURE kPa (Gauge)	RELATIVE VOLUME V/Vsat (1)	Y FUNCTION (2)	OIL DENSITY kg/m^3
	34474	0.9711		798.2
	27579	0.9769		793.5
	20684	0.9830		788.6
	13790	0.9898		783.2
	6895	0.9972		777.4
	6205	0.9980		776.8
	5516	0.9989		776.1
Ps	4551	1.0000		775.2
	4378	1.0117	3.307	
	4089	1.0349	3.156	
	3709	1.0744	2.971	
	3296	1.1338	2.761	
	2910	1.2127	2.562	
	2517	1.3292	2.360	
	2172	1.4783	2.188	
	1841	1.6883	2.027	
	1572	1.9380	1.898	

(1) Cubic metres at indicated pressure and temperature per cubic metre of saturated oil.

(2) $Y = \dfrac{(Psat-P)}{(P + 101.325)(\text{Relative Volume} - 1)}$

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DIFFERENTIAL VAPORIZATION AT 42.2°C

OIL PROPERTIES

	PRESSURE kPa (GAUGE)	OIL DENSITY kg/m^3 C_o	RELATIVE OIL VOLUME (1) B_o	RELATIVE TOTAL VOLUME (2) B_t	SOLUTION GAS-OIL RATIO (3) R_s	LIBERATED GAS-OIL RATIO R_l
P_s	4551	775.2	1.196	1.196	53.67	0.00
	3861	775.7	1.191	1.268	50.69	2.98
	3034	777.9	1.183	1.409	46.78	6.89
	2413	779.8	1.175	1.597	43.40	10.27
	1724	782.7	1.164	2.011	38.77	14.90
	1014	787.3	1.148	3.139	32.37	21.30
	634	791.0	1.136	4.793	28.10	25.57
	0	824.7	1.022	59.838	0.00	53.67

Gravity of Residual Oil - 36.3° API @ 15.6°C

Density of Residual Oil - 842.4 kg/m^3 @ 15.6°C

(1) Cubic metres of oil at indicated pressure and temperature per cubic metre of residual oil at 15.0°C.

(2) Cubic metres of oil plus liberated gas at indicated pressure and temperature per cubic metre of residual oil at 15.0°C.

(3) Cubic metres of gas at 101.325 kPa (absolute) and 15.0°C per cubic metre of residual oil at 15.0°C.

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DIFFERENTIAL VAPORIZATION AT 42.0°C

GAS PROPERTIES

PRESSURE kPa (Gauge)	INCREMENTAL GAS RELATIVE DENSITY (1)	CUMULATIVE GAS RELATIVE DENSITY (1)	INCREMENTAL DEVIATION FACTOR (Z)	GAS FORMATION VOLUME FACTOR (2) B_g	GAS EXPANSION FACTOR (3) $1/B_g$
P_s 4551					
3861	0.891	0.891	0.926	0.02595	38.54
3034	0.860	0.873	0.928	0.03287	30.42
2413	0.868	0.872	0.930	0.04107	24.35
1724	0.893	0.878	0.934	0.05682	17.60
1014	0.956	0.902	0.939	0.09349	10.70
634	1.049	0.926	0.947	0.14301	6.99
0	1.607	1.284	1.000	1.09589	0.91

(1) AIR = 1.000

(2) Cubic metres of gas at indicated pressure and temperature per cubic metre at 101.325 kPa (absolute) at 15.0°C.

(3) Cubic metres of gas at 101.325 kPa (absolute) and 15.0°C per cubic metre at indicated pressure and temperature.

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RESERVOIR FLUID VISCOSITY AT 42.0°C

PRESSURE kPa (Gauge)	OIL VISCOSITY mPa.S	GAS VISCOSITY mPa.S (1)	OIL/GAS VISCOSITY RATIO
34474	1.783		
31026	1.720		
27579	1.657		
24132	1.596		
20684	1.533		
17237	1.470		
13790	1.407		
10342	1.345		
6895	1.282		
4551	1.239		
3861	1.268	0.0116	109.31
3034	1.324	0.0113	117.17
2413	1.379	0.0111	124.23
1724	1.439	0.0108	133.24
1014	1.568	0.0104	150.77
634	1.752	0.0100	175.20
0	2.939	0.0082	358.41

(1) Calculated from the correlation by Lee, Eakin and Gonzalez: "The Viscosity of Natural Gases". August 1966 - Journal of Petroleum Technology.

COMPANY Home Oil Company Limited
WELL Home Scurry S Pierson 6-19-2-29 (W1M)

FLASH TEST OF TREATER OIL SAMPLE

STOCK TANK PRESSURE kPa (Gauge)	STOCK TANK TEMPERATURE °C	GAS-OIL RATIO R_1 (1)	GAS-OIL RATIO R_1 (2)	STOCK TANK OIL GRAVITY ° API @ 15.6°C	SEPARATOR VOLUME FACTOR B_o (3)	STOCK TANK VOLUME FACTOR (4)	RELATIVE DENSITY OF LIBERATED GAS (5)
131 to 0	15.0	-	3.11	38.4	1.041	-	0.976
		TOTAL	3.11				

This data was used to develop the recombined reservoir fluid; i.e., the treater gas and oil were physically recombined to the specified gas-oil ratio of 44.44 m^3/m^3 stock tank liquid.

(1) Cubic metres of gas @ 101.325 kPa (absolute) and 15.0°C per cubic metre of oil @ indicated pressure and temperature.
(2) Cubic metres of gas @ 101.325 kPa (absolute) and 15.0°C per cubic metre of stock tank oil @ 15.0°C.
(3) Cubic metres of saturated oil @ 131 kPa (gauge) and 54.4°C per cubic metre of stock tank oil @ 15.0°C.
(4) Cubic metres of oil @ indicated pressure and temperature per cubic metre of stock tank oil @ 15.0°C.
(5) AIR = 1.000.

COMPANY Home Oil Company Limited
WELL Home Scurry S Pierson 6-19-2-29 (W1M)

FILE 55377-87-258

SEPARATOR TEST OF RESERVOIR FLUID SAMPLE

SEPARATOR PRESSURE kPa (Gauge)	SEPARATOR TEMPERATURE °C	GAS-OIL RATIO R_1 (1)	GAS-OIL RATIO R_1 (2)	STOCK TANK OIL GRAVITY ° API @ 15.6°C	FORMATION VOLUME FACTOR B_o (3)	SEPARATOR VOLUME FACTOR (4)	RELATIVE DENSITY OF LIBERATED GAS (5)
4551							
to							
131	54.4	45.82	47.20			1.030	1.184
to							
0	26.7	3.05	3.08	37.6	1.178	1.009	N/M
		TOTAL	50.28				

N/M - Not measured due to insufficient liberated gas.

(1) Cubic metres of gas @ 101.325 kPa (absolute) and 15.0°C per cubic metre of oil @ indicated pressure and temperature.
(2) Cubic metres of gas @ 101.325 kPa (absolute) and 15.0°C per cubic metre of stock tank oil @ 15.0°C.
(3) Cubic metres of saturated oil @ 4551 kPa (gauge) and 42.0°C per cubic metre of stock tank oil @ 15.0°C.
(4) Cubic metres of oil @ indicated pressure and temperature per cubic metre of stock tank oil @ 15.0°C.
(5) AIR - 1.000.

CORE LABORATORIES

HYDROCARBON LIQUID ANALYSIS

B327 — CONTAINER IDENTITY

55377-87-258 — LABORATORY NUMBER

Home Oil Company Limited — OPERATOR

LSD 6-19-2-29 W1M — LOCATION

Home Scurry S Pierson 6-19-2-29 — WELL OR SAMPLE LOCATION NAME

KB ELEV.(m) — GR ELEV.(m)

South Pierson, Manitoba — FIELD OR AREA

POOL OR ZONE

SAMPLER

TEST TYPE & NO.

TEST RECOVERY

Recombined Reservoir Fluid — POINT OF SAMPLE

AMT. & TYPE CUSHION

@ °C — MUD RESISTIVITY

PUMPING | FLOWING | GAS LIFT | SWAB

TEST INTERVALS (metres)

WATER m^3/d | OIL m^3/d | GAS m^3/d

SEPARATOR	RESERVOIR	@ °C CONTAINER WHEN SAMPLED	@ °C CONTAINER WHEN RECEIVED	SEPARATOR
	4551			42.0

PRESSURES, kPa (gauge) — TEMPERATURES, °C

DATE SAMPLED (Y/M/D)	DATE RECEIVED (Y/M/D)	DATE ANALYZED (Y/M/D)	ANALYST	REMARKS
		87 11 01	DW	

COMPONENT	MOLE FRACTION	MASS FRACTION	LIQUID VOLUME FRACTION
N_2	0.0125	0.0026	0.0025
CO_2	0.0001	0.0000	0.0000
H_2S	0.0000	0.0000	0.0000
C_1	0.1058	0.0125	0.0323
C_2	0.0787	0.0174	0.0379
C_3	0.0943	0.0306	0.0468
iC_4	0.0182	0.0078	0.0107
C_4	0.0603	0.0258	0.0342
iC_5	0.0246	0.0131	0.0163
C_5	0.0356	0.0189	0.0232
C_{6+}	0.5699	0.8713	0.7961
TOTAL	1.0000	1.0000	1.0000

OBSERVED PROPERTIES OF C_{6+} RESIDUE (15/15°C)

849.9 kg/m³	0.8507	34.9
DENSITY	RELATIVE DENSITY	API & 15.5° C

208 — RELATIVE MOLECULAR MASS

CALCULATED PROPERTIES OF TOTAL SAMPLE (15/15°C)

776.5 kg/m³	0.7772	50.6
DENSITY	RELATIVE DENSITY	API & 15.5° C

135.99 — RELATIVE MOLECULAR MASS

REMARKS

Refer to page 9 of 25 for extended analysis of hexanes plus.

HYDROCARBON LIQUID ANALYSIS

OPERATOR Home Oil Company Limited
WELL Home Scurry S Pierson 6-19-2-29
SAMPLE POINT Recombined Reservoir Fluid

FILE 55377-87-258
DATE 87 11 01

Analysis of C_6+ Fraction

Boiling Point Range (°C)	Component	Carbon Number	Mole Fraction	Mass Fraction
36.1- 68.9	Hexanes	C_6	0.0472	0.0339
68.9- 98.3	Heptanes	C_7	0.0466	0.0388
98.3-125.6	Octanes	C_8	0.0426	0.0405
125.6-150.6	Nonanes	C_9	0.0325	0.0346
150.6-173.9	Decanes	C_{10}	0.0385	0.0455
173.9-196.1	Undecanes	C_{11}	0.0328	0.0426
196.1-215.0	Dodecanes	C_{12}	0.0268	0.0379
215.0-235.0	Tridecanes	C_{13}	0.0257	0.0393
235.0-252.2	Tetradecanes	C_{14}	0.0226	0.0373
252.2-270.6	Pentadecanes	C_{15}	0.0183	0.0324
270.6-287.8	Hexadecanes	C_{16}	0.0167	0.0315
287.8-302.8	Heptadecanes	C_{17}	0.0135	0.0269
302.8-317.2	Octadecanes	C_{18}	0.0124	0.0263
317.2-330.0	Nonadecanes	C_{19}	0.0124	0.0278
330.0-344.4	Eicosanes	C_{20}	0.0094	0.0220
344.4-357.2	Heneicosanes	C_{21}	0.0090	0.0222
357.2-369.4	Docosanes	C_{22}	0.0075	0.0194
369.4-380,0	Tricosanes	C_{23}	0.0069	0.0186
380.0-391.1	Tetracosanes	C_{24}	0.0065	0.0184
391.1-401.7	Pentacosanes	C_{25}	0.0058	0.0171
401.7-412.2	Hexacosanes	C_{26}	0.0047	0.0144
412.2-422.2	Heptacosanes	C_{27}	0.0045	0.0143
422.2-431.7	Octacosanes	C_{28}	0.0042	0.0137
431.7-441.1	Nonacosanes	C_{29}	0.0039	0.0131
441.1 PLUS	Triacontanes Plus	C_{30}+	0.0259	0.1292
80.0	Benzene	C_6H_6	0.0043	0.0028
110.6	Toluene	C_7H_8	0.0170	0.0131
136.1-138.9	Ethylbenzene, p + m-Xylene	C_8H_{10}	0.0164	0.0145
144.4	o-Xylene	C_8H_{10}	0.0055	0.0048
168.9	1,2,4 Trimethylbenzene	C_9H_{12}	0.0065	0.0065
48.9	Cyclopentane	C_5H_{10}	0.0010	0.0006
72.2	Methylcyclopentane	C_6H_{12}	0.0126	0.0088
81.1	Cyclohexane	C_6H_{12}	0.0142	0.0099
101.1	Methylcyclohexane	C_7H_{14}	0.0155	0.0126
	TOTAL		0.5699	0.8713
68.9 PLUS	Mole Fraction of C_7+			0.5217
68.9 PLUS	Mass Fraction of C_7+			0.8368
68.9 PLUS	Calculated Relative Molecular Mass of C_7+			219
68.9 PLUS	Calculated Relative Density of C_7+			0.8605
68.9 PLUS	Calculated Density of C_7+ (kg/m^3)			859.8

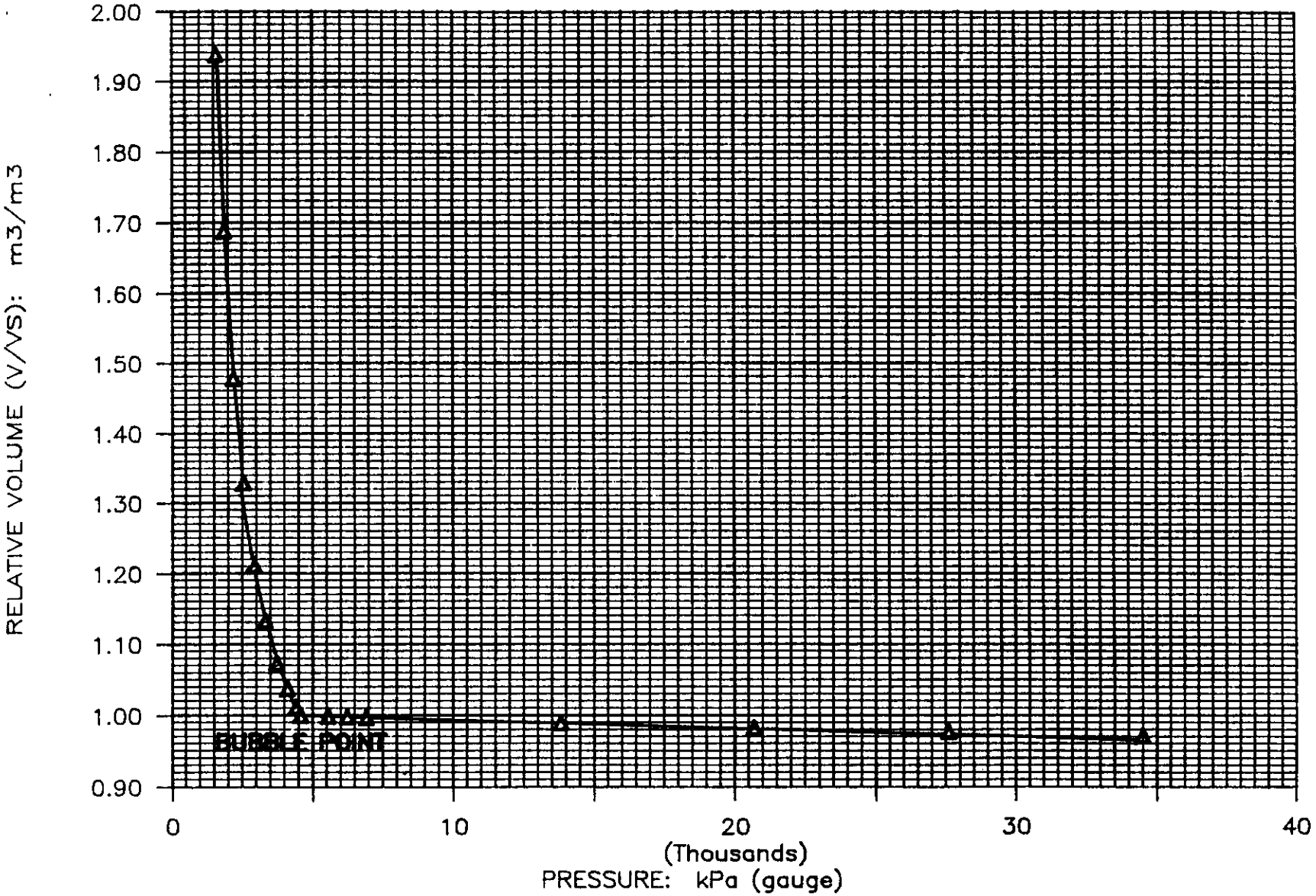
The above hexanes plus values are based upon a measured mass fraction and a calculated mole fraction, and assume a total hydrocarbon recovery from the chromatographic system.

SECTION II

Illustrations

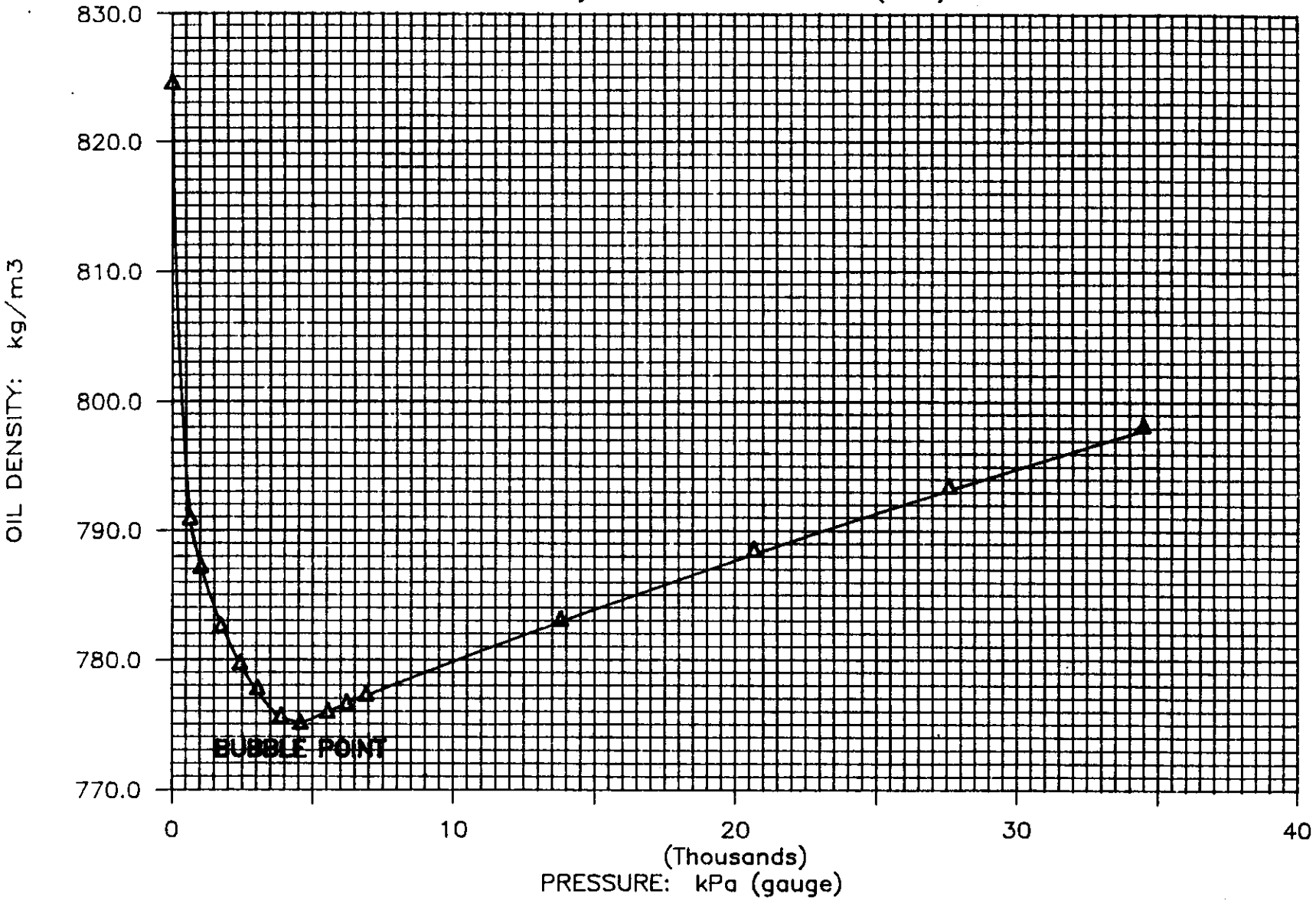
RELATIVE VOLUME (V/VS)

Home Scurry S.Pierson 6-19-2--29(W1M)



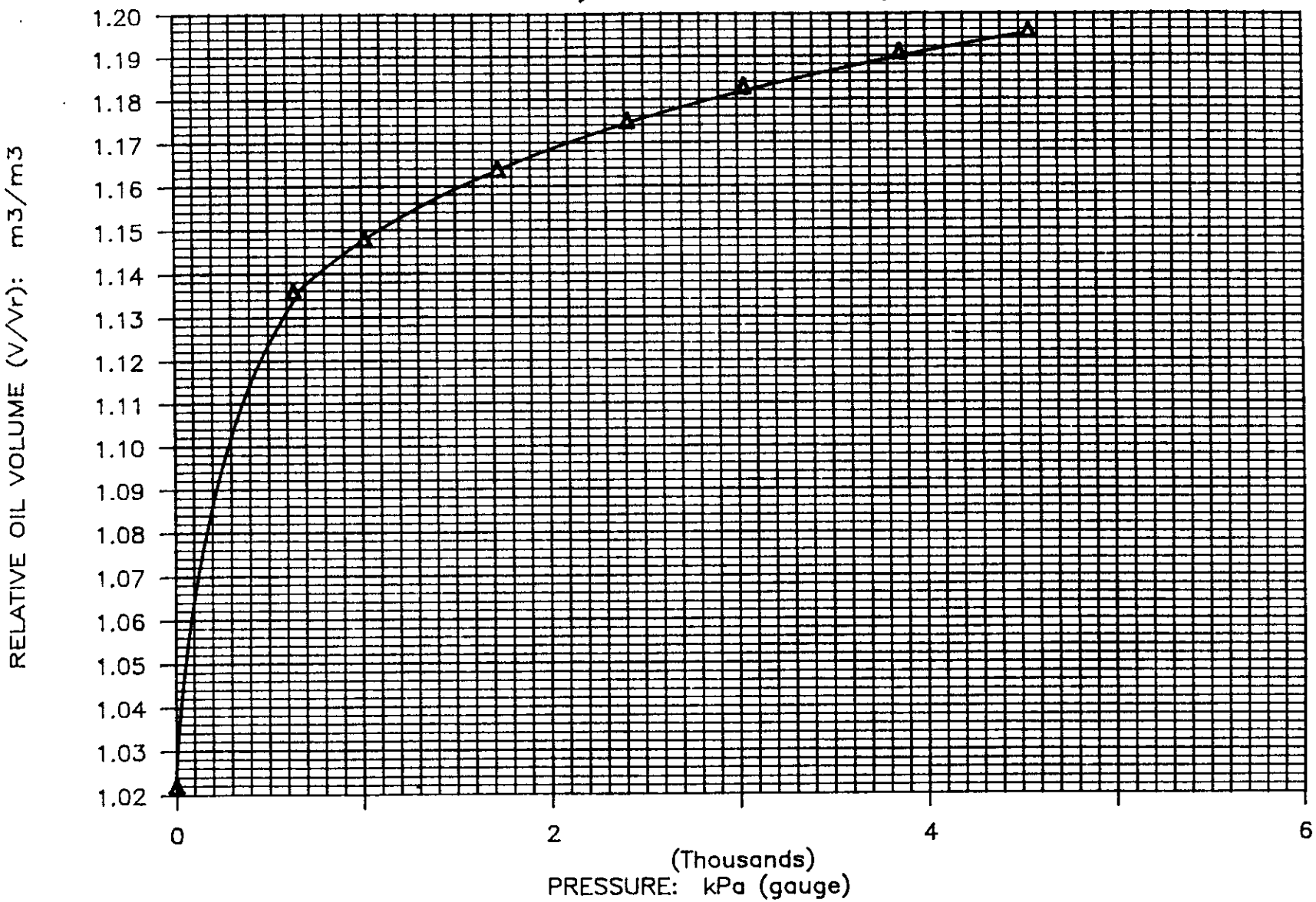
OIL DENSITY

Home Scurry S.Pierson 6-19-2-29(W1M)



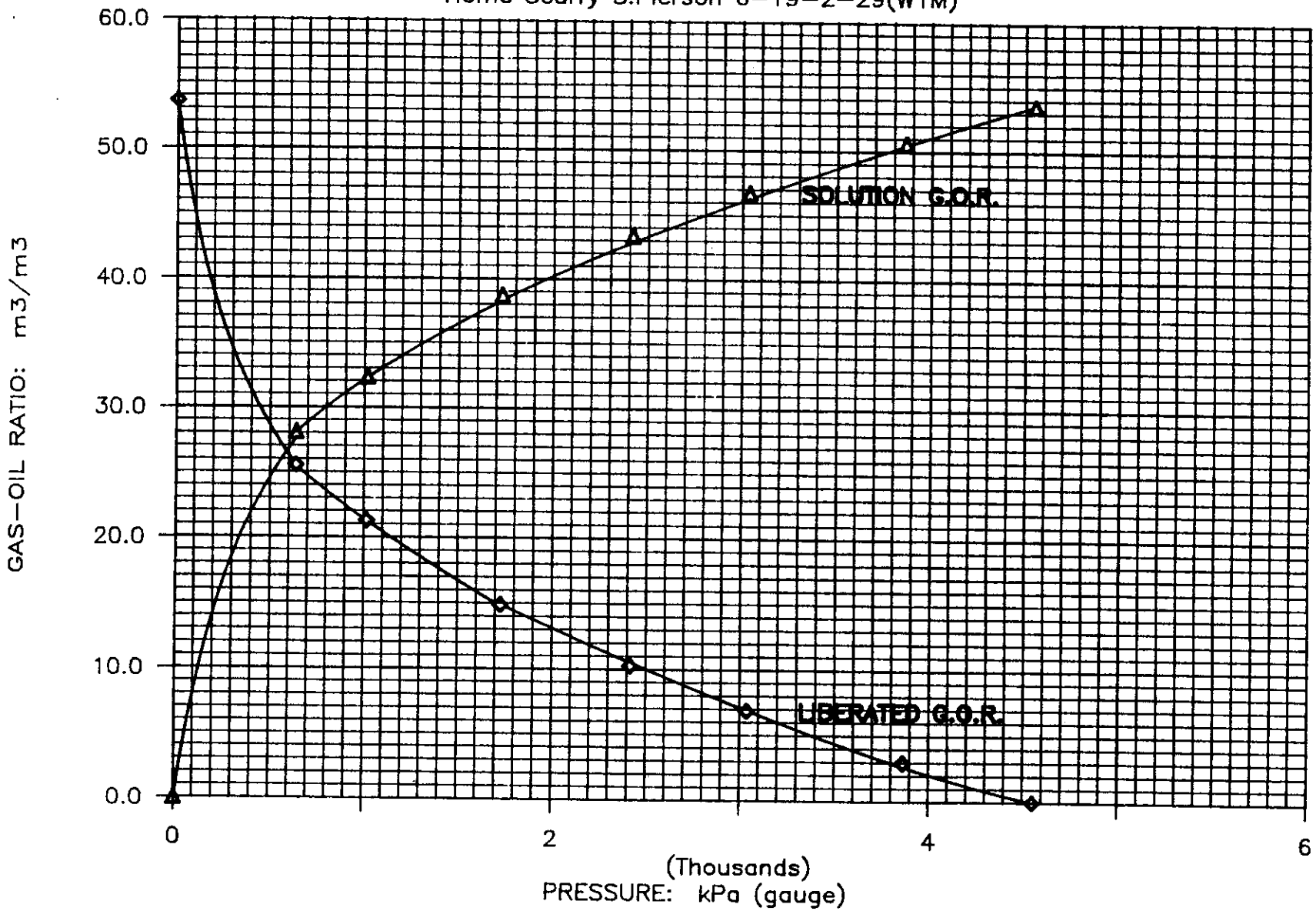
RELATIVE OIL VOLUME (V/Vr)

Home Scurry S.Pierson 6-19-2-29(W1M)



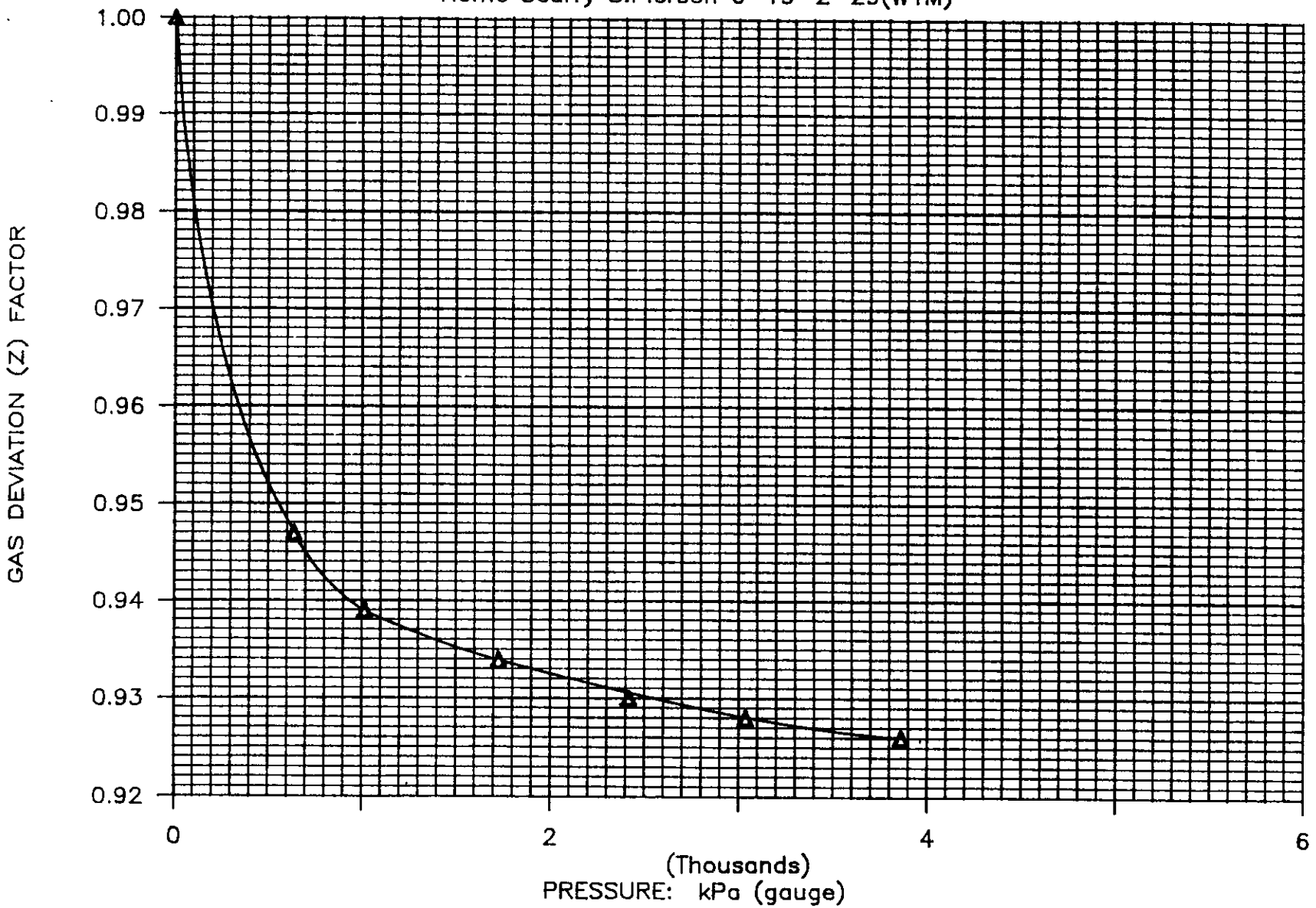
GAS—OIL RATIO

Home Scurry S.Pierson 6—19—2—29(W1M)



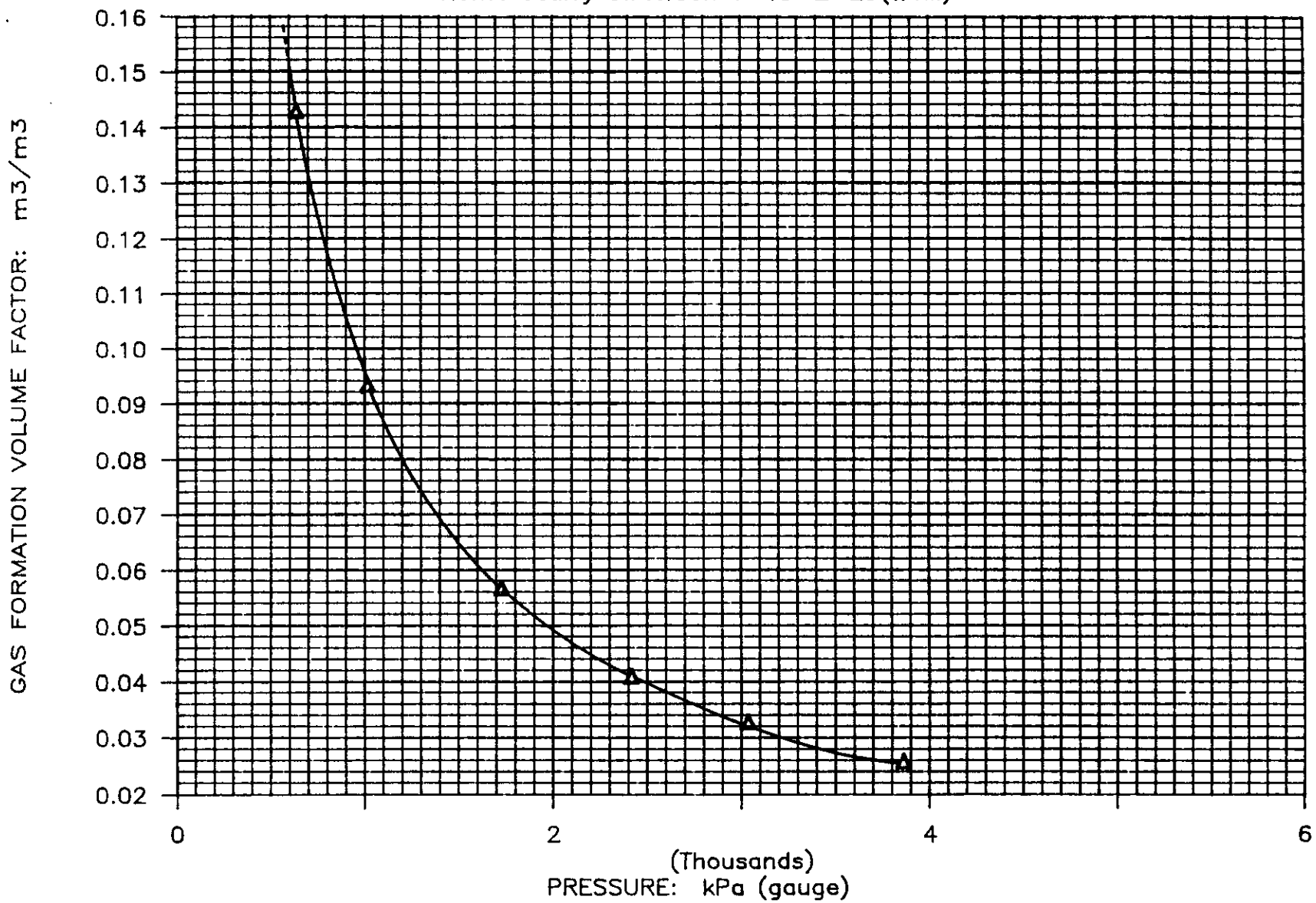
GAS DEVIATION (Z) FACTOR

Home Scurry S.Pierson 6-19-2-29(W1M)



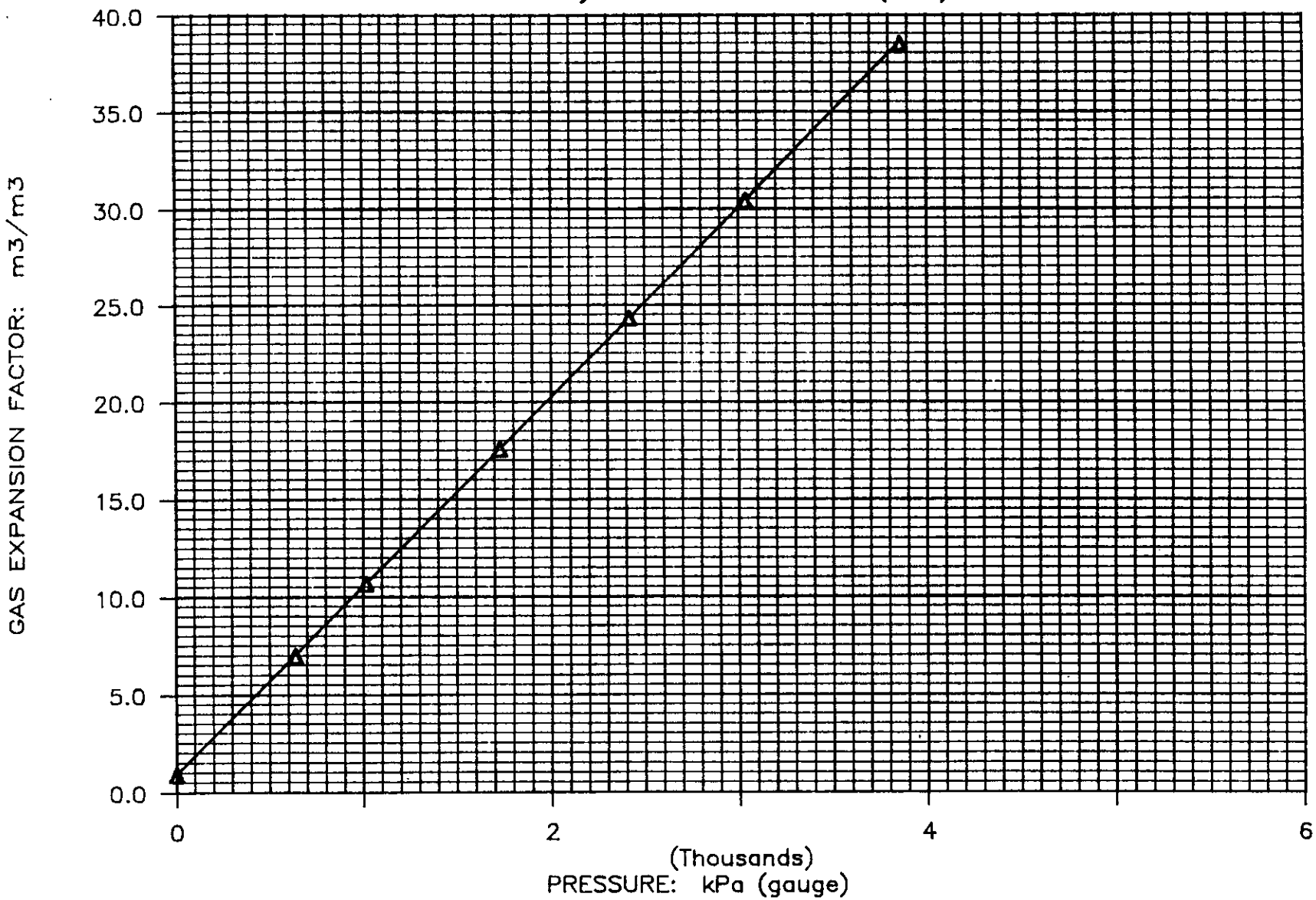
GAS FORMATION VOLUME FACTOR

Home Scurry S.Pierson 6-19-2-29(W1M)



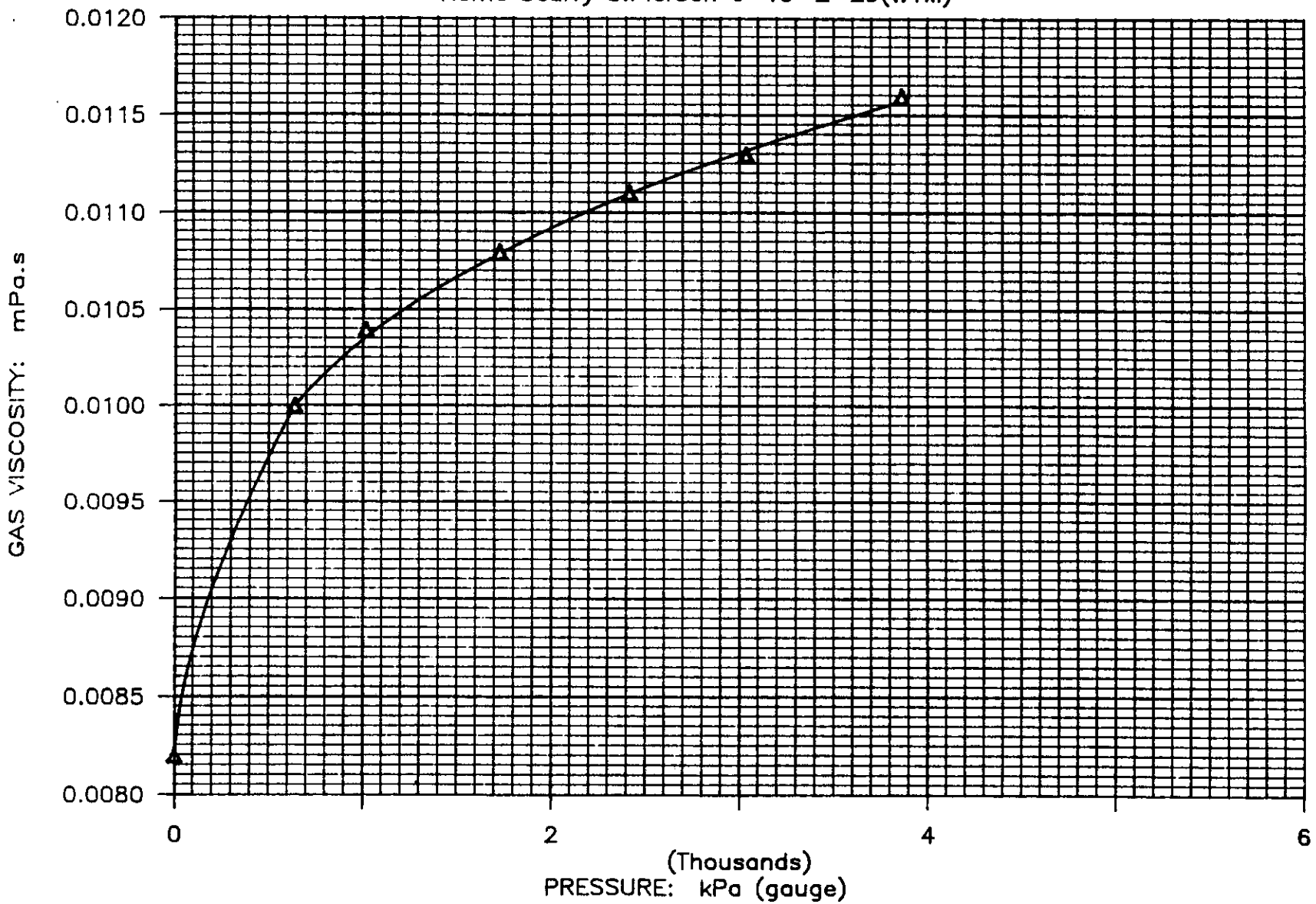
GAS EXPANSION FACTOR

Home Scurry S.Pierson 6-19-2-29(W1M)



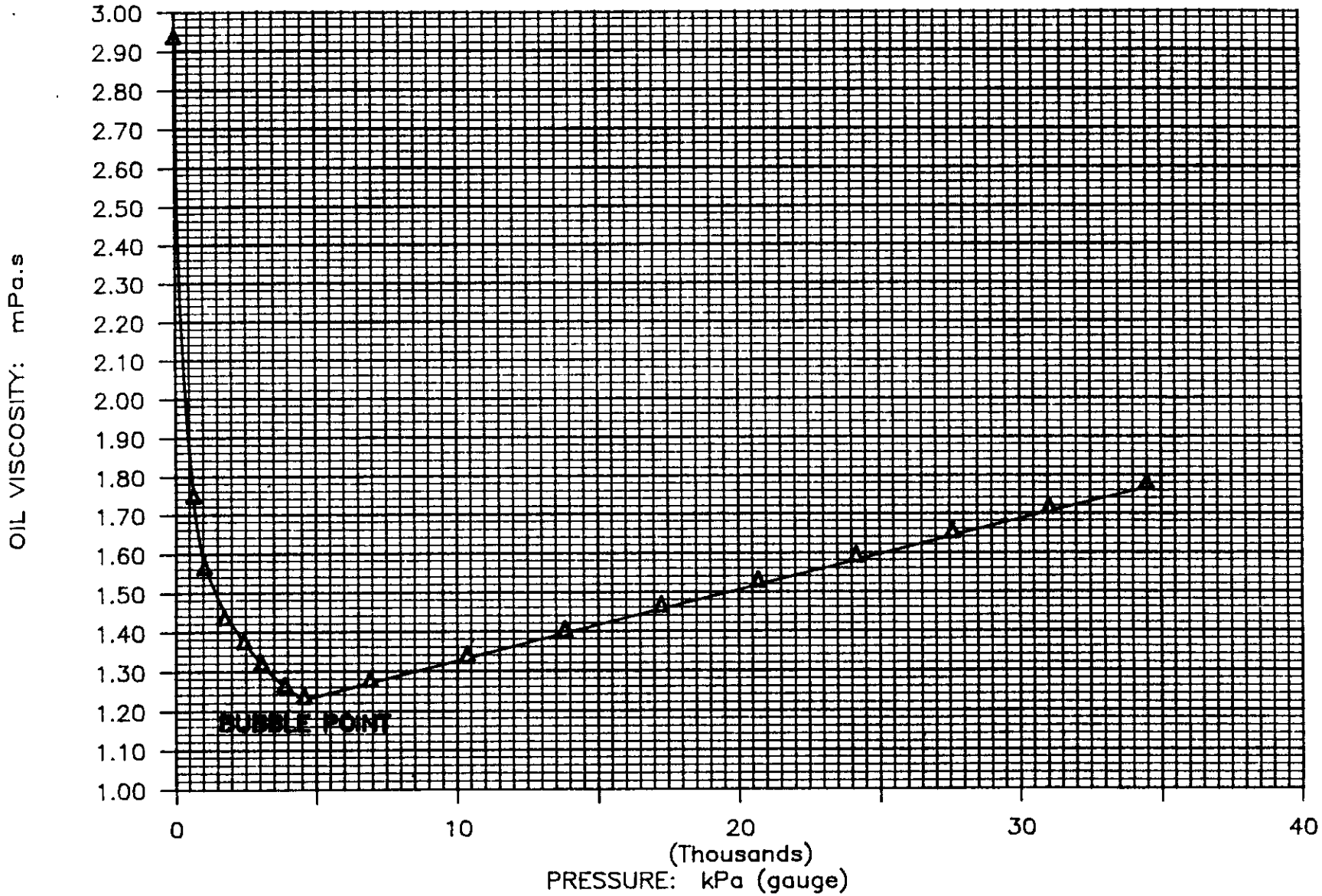
GAS VISCOSITY

Home Scurry S.Pierson 6-19-2-29(W1M)



OIL VISCOSITY

Home Scurry S.Pierson 6-19-2-29(W1M)



SECTION III

Data Adjustment

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INTRODUCTION TO DATA ADJUSTMENT

Reservoir fluids, while being produced, simultaneously undergo two different thermodynamic processes. One is the flash separation process which occurs in surface separation facilities, and the second is insitu reservoir fluid expansion ultimately resulting in differential equilibrium separation of gas and oil in the reservoir during reservoir pressure decline.

Flash separation data are referenced to reservoir fluid volumes at saturation pressure (bubble point). The data are usable only at the specific instant when the reservoir pressure is equal to the saturation pressure as determined in the PVT study.

It is therefore necessary to adjust flash separation data to account for the insitu changes in reservoir fluid properties that will occur during primary pressure depletion. Both the flash solution gas-oil ratio data (R_s) and the flash formation volume factor data (B_o) requires adjustment for pressures above and below the saturation pressure.

The methods by which these adjustments are made are as follows:

A. Solution Gas-Oil Ratio (R_s)

Pressures above P_s: No correction is required as no gas will escape from solution at pressures above the saturation pressure. Therefore, R_s is equal to flash R_s at all pressures in excess of P_s.

Pressures below P_s: Due to insitu differential equilibrium separator of gas and oil, flash separation data must be corrected as follows:

$$R_s = R_sfb - (R_sdb - R_sd) \frac{B_ofb}{B_odb}$$

R_s = Adjusted Solution Gas-Oil Ratio

R_sfb = Total Gas-Oil Ratio from Flash at Saturation Pressure

R_sdb = Gas-Oil Ratio from Differential Liberation at Saturation Pressure

R_sd = Gas-Oil Ratio from Differential Liberation at Pressure less than Saturation Pressure

B_ofb = Formation Volume Factor from Flash at Saturation Pressure

B_odb = Relative Oil Volume from Differential Liberation at Saturation Pressure

This correction must be made for all D.V. gas-oil ratio data points below saturation pressure.

B. Formation Volume Factor (B_o)

Pressures above P_s: Because flash formation volume factors are referenced to a volume at saturation pressure, B_o at pressures above saturation pressure must be corrected to account for oil compressibility. The adjustment is:

Adjusted B_o = $B_ofb \times V/Vsat$

Adjusted B_o = Flash Formation Volume Factor for Pressures above Saturation Pressure

B_ofb = Formation Volume Factor from Flash at Saturation Pressure

$V/Vsat$ = Relative Volume from Pressure Volume Relations at Pressure above Saturation Pressure

Pressures below P_s: Because insitu oil shrinkage occurs due to differential gas liberation at pressures below the saturation pressure (P_s), flash formation volume factors which are referenced to a volume at saturation pressure must be corrected to reflect insitu reservoir fluid shrinkage. The adjustment is as follows:

$$\text{Adjusted } B_o = B_od \frac{B_ofb}{B_odb}$$

Adjusted B_o = Flash Formation Volume Factors for Pressure below Saturation Pressure

B_od = Relative Oil Volume from Differential Liberation at Pressure below Saturation Pressure

B_ofb = Formation Volume Factor from Flash at Saturation Pressure

B_odb = Relative Oil Volume from Differential Liberation at Saturation Pressure

This adjustment must be made for all D.V. relative oil volumes below the saturation pressure.

The above adjustments have been made on your behalf and are reported on the following pages.

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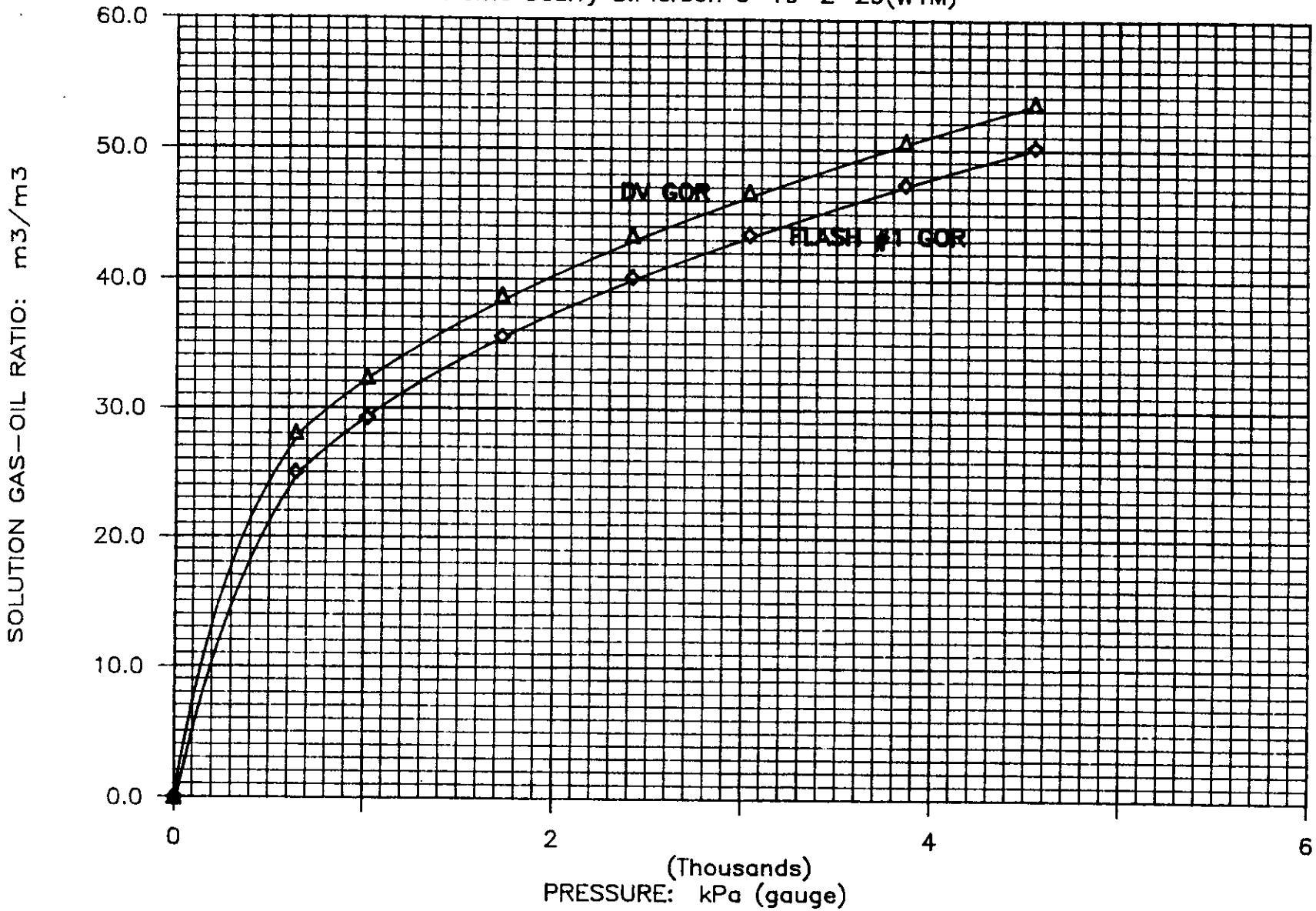
ADJUSTED SOLUTION GAS-OIL RATIOS

PRESSURE kPa (Gauge)	DV GOR R_s	FLASH GOR R_s
34474	53.67	50.28
27579	53.67	50.28
20684	53.67	50.28
13790	53.67	50.28
6895	53.67	50.28
6205	53.67	50.28
5516	53.67	50.28
4551	53.67	50.28
3861	50.69	47.34
3034	46.78	43.49
2413	43.40	40.16
1724	38.77	35.60
1014	32.37	29.30
634	28.10	25.09
0	0.00	0.00

ADJUSTED SOLUTION GAS–OIL RATIOS

Home Scurry S.Pierson 6–19–2–29(W1M)



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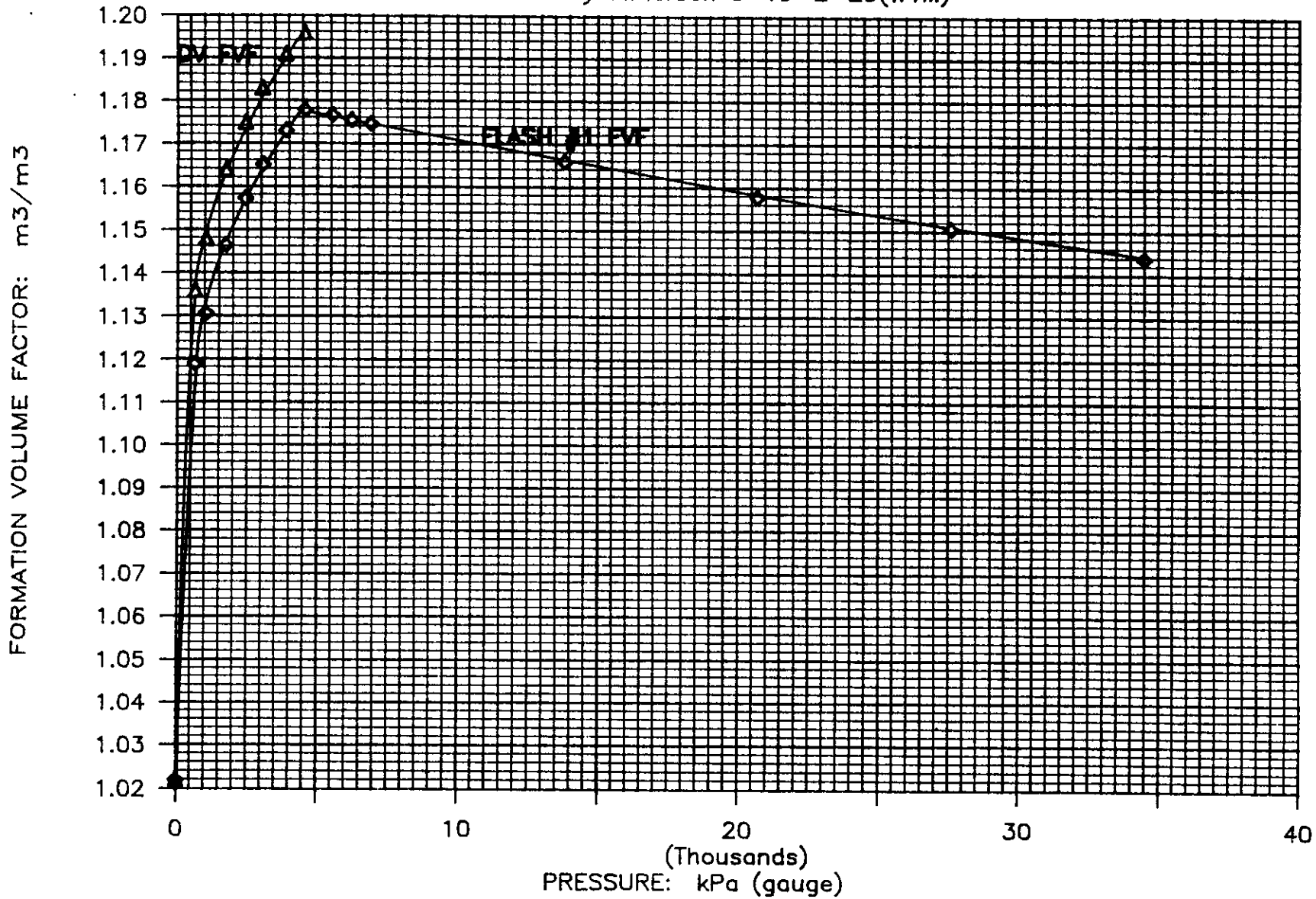
WELL	Home Scurry S Pierson 6-19-2-29	FILE	55377-87-258

ADJUSTED SOLUTION GAS-OIL RATIOS

PRESSURE kPa (Gauge)	DV FVF B_o	FLASH FVF B_o
34474		1.144
27579		1.151
20684		1.158
13790		1.166
6895		1.175
6205		1.176
5516		1.177
4551	1.196	1.178
3861	1.191	1.173
3034	1.183	1.165
2413	1.175	1.157
1724	1.164	1.146
1014	1.148	1.131
634	1.136	1.119
0	1.022	1.022

ADJUSTED FORMATION VOLUME FACTORS

Home Scurry S.Pierson 6-19-2-29(W1M)



Manitoba

Energy and Mines | Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

November 30, 1987

Home Oil Company Limited
1700 Home Oil Tower
324 - Eighth Ave. S.W.
Calgary, Alberta
T2P 2Z5

Attention: Mr. G. Martineau

Dear Sir:

Re: South Pierson Lower Amaranth B Pool
Reservoir PVT and Pressure Data

Your letter of November 19, 1987 with attached reservoir fluid PVT analysis and pressure buildup survey is acknowledged. Your prompt response to our request is appreciated.

While the pressure measured at 6-19-2-29 is well above the bubble point, I suggest that due to the remoteness of this well from other production and the Low reservoir permeability, this survey may not reflect the effects of continuous production on pressure levels. It is further suggested that such effects may be best determined by re survey of a well which has had significant cumulative production.

Pressure data obtained for the major developed Lower Amaranth Pool in Manitoba (Waskada Lower Amaranth A Pool) has indicated this pool to be subject to very severe primary pressure declines. This has resulted in the need for early implementation of pressure maintenance in this pool. As the South Pierson Lower Amaranth B Pool is geologically similar to the major Waskada pool, I suggest that further reservoir pressure data should be obtained to better define its producing characteristics and to help assess the need for and urgency of pressure maintenance. You are therefore requested to obtain a reservoir pressure survey of a minimum of one well which has had substantial cumulative production. You are further requested to submit the results of this test not later than January 31, 1988.

If you have any comments or questions with respect to the foregoing, please contact the undersigned at (204) 945-6574.

Your sincerely,

L.R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

LRD/sml

home oil

1987-11-19

Manitoba Energy and Mines
555 - 330 Graham Avenue
Winnipeg, Manitoba
R3C 4E3

Attention: Mr. L.R. Dubreuil

Dear Sir:

Re: South Pierson Lower Amaranth B Pool
PVT and Reservoir Pressure Data

Please find attached a reservoir fluid study that was conducted on samples collected from the subject field. Also attached is a flow and build-up test that was conducted this year to determine the reservoir pressure.

If additional information is required, please contact Mr. Greg Martineau in our Calgary office at (403) 232-7699.

Yours truly,

HOME OIL COMPANY LIMITED

R.R. Padget, P. Eng.
Manager, Reservoir Engineering

GDM/jlc
Attachment
929e

cc: G. Martineau
D. Botterill
FILE: 13-PIER
Reading File

DEPARTMENT OF ENERGY AND MINES
NOV 24 1987
PETROLEUM BRANCH

Home Oil Company Limited
1700 Home Oil Tower
324 Eighth Avenue S.W.
Calgary, Alberta, Canada
T2P 2Z5
Telephone (403) 232-7100

TEAM PETROLEUM'88

Manitoba

Energy and Mines | Petroleum

555 — 330 Graham Avenue
Winnipeg, Manitoba, CANADA
R3C 4E3

(204) 945-6577

November 5, 1987

Home Oil Company Limited
1700 Home Oil Tower
324 - 8th Avenue S.W.
CALGARY, Alberta T2P 2Z5

Attention: R.R. Padget,
Manager, Reservoir Engineering

Re: South Pierson Lower Amaranth B Pool
PVT Data

Dear Sir:

Drilling carried out by your Company over the past two years has resulted in the discovery and development of the subject Pool. Development drilling and early production performance indicates that the Pool is a significant discovery.

In order to properly evaluate and develop the Pool for maximum recovery, basic reservoir information should be obtained. One of the most important pieces of information that can be obtained for a new pool is a PVT analysis of a reservoir fluid sample. Due to the possibility that production may result in pressure drawdown below the bubble point, this data should be obtained early in the life of the reservoir.

We note that as of yet, no reservoir fluid PVT analysis has been submitted for the above Pool. You are therefore requested, pursuant to Section 93 of The Petroleum Drilling and Production Regulations to submit your plans to obtain this data. We request that your plans be submitted prior to December 1, 1987 and that a full PVT analysis be submitted prior to January 31, 1988. In addition, you are requested to submit plans for a survey designed to determine the average reservoir pressure of the Pool.

Any questions or comments in this regard may be directed to the undersigned.

Yours sincerely,

L.R. Dubreuil
Chief Petroleum Engineer
Petroleum Division

LRD:dah