

RESERVOIR FLUID ANALYSIS

FOR

STATOIL

WELL: 6407/1-3 DST No.2



CORE LABORATORIES
Petroleum Reservoir Engineering
CCB, ÅGOTNES

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WELL: 6407/1-3 DST No.2

CORE LABORATORIES
Petroleum Reservoir Engineering

CCB, ÅGOTNES
28th May 1984

Statoil
Damsgårdsgaten 131
P.O. Box 1212
5001 Bergen

Attention: Jon Hanstveit

Subject: Reservoir Fluid Study
Well: 6407/1-3 DST No. 2
Tyrihans Field, Norway
Our file no: RFLN 840009

Gentlemen,

On the 3rd of April 1984 a sample of separator liquid and two samples of separator vapour, collected from the subject well, were received in our Ågotnes laboratory for use in a reservoir fluid study. The results of this study as requested by a representative of Statoil are presented in the following report.

On arrival in the laboratory the ambient temperature bubble point of the separator liquid was found to be 58.4 Barg at 16°C. The opening pressures of the gas sample cylinders were found to be 70.3 Barg and 76.5 Barg at 36°C for cylinder numbers A14048 and A14770 respectively, both cylinders were found to contain small amounts of excess condensate. The hydrocarbon composition to decanes plus of the separator gas was determined by gas chromatography, and of the separator liquid by low and high temperature fractional distillation. After correction for the factors shown on page one, the producing gas-liquid ratio was calculated to be 3114 standard cubic metres separator gas per cubic metre of primary separator liquid at 69 Bar A and 36°C. The hydrocarbon composition of the well stream material was calculated by utilising the producing gas liquid ratio, in conjunction with the measured hydrocarbon compositions of the separator products. These data are tabulated on page two of this report.

Samples of the gas and liquid were physically recombined in the above gas/liquid ratio. The resultant reservoir fluid was subjected to constant composition expansion at the reported reservoir temperature of 132.5°C. During this expansion, a retrograde dew point of 365.8 Bar A was observed. The results of the pressure-volume measurements are presented on page four along with the deviation factor measurements at the dew point pressure and above.

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A large portion of the recombined fluid was then subjected to a constant volume depletion at the reservoir temperature of 132.5°C. After determining the original saturated sample volume, a series of expansions and constant pressure displacements were made, with each displacement terminating at the original sample volume. Each displacement well stream was charged to low temperature fractional distillation equipment for compositional analysis, deviation factor measurement and determination of produced volume. The composition of the heptanes plus fraction from each displacement well stream was determined by gas - liquid chromatography. A summary of the data resultant from the constant volume depletion may be found on page five.

Calculations were then performed to predict the cumulative surface recoveries that may be expected during the pressure depletion of the reservoir. These calculations were performed by utilising the smooth compositional data in conjunction with published equilibrium ratios. The results of these surface recovery calculations may be found on pages six and seven.

Visual measurements of the retrograde condensation were performed at several points during the constant composition expansion, and at each point during the constant volume depletion. The maximum observed volume of retrograde condensation was approximately 3.1% of the hydrocarbon pore space. A tabulation of these retrograde volume measurements may be found on page eight and are graphically represented on page fifteen.

The smooth well stream compositions were then used in conjunction with the correlation of Carr, Kobayashi and Burrows to calculate the viscosity of the well streams during the depletion at 132.5°C. The results of these calculations may be found on page nine and are graphically represented on page sixteen.

The hydrocarbon composition of the equilibrium liquid remaining in the cell at the termination of the depletion was determined by gas - liquid chromatography and may be found on page ten.

It has been a pleasure to be of service to Statoil. Should any questions arise concerning data presented in this report, or if we may be of service in any other matter, please do not hesitate to contact us.

Very truly yours,
Core Laboratories Norsk



Duncan Thow
RFL Operations Supervisor

DT/ah
7cc/Addressee

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| | | | |
|---------|--------------------------|--------------|-------------------------|
| Company | <u>Statoil</u> | Date Sampled | <u>5th January 1984</u> |
| Well | <u>6407/1-3 DST No.2</u> | State | <u></u> |
| Field | <u>Tyrihans</u> | Country | <u>Norway</u> |

FORMATION CHARACTERISTICS

| | |
|------------------------------------|-------------------------------------|
| Formation Name | <u>Middle Jurassic</u> |
| Date First Well Completed | <u>, 19</u> |
| Original Reservoir Pressure | <u>Bar G @ m</u> |
| Original Produced Gas-Oil Ratio | <u>Sm³/m³</u> |
| Production Rate | <u>m³/Day</u> |
| Separator Pressure and Temperature | <u>Bar G °C</u> |
| Liquid Density at 15°C | <u>Kg/m³</u> |
| Datum | <u>m Subsea</u> |

WELL CHARACTERISTICS

| | |
|-------------------------|-----------------------------|
| Elevation | <u>m RKB</u> |
| Total Depth | <u>m</u> |
| Producing Interval | <u>3665-3670 m</u> |
| Tubing Size and Depth | <u>3½ In. to 3403 m</u> |
| Open Flow Potential | <u>Sm³ /Day</u> |
| Last Reservoir Pressure | <u>378 Bar A @ 3658.9 m</u> |
| Date | <u>5th January , 1984</u> |
| Reservoir Temperature | <u>132.5°C @ m</u> |
| Status of Well | <u></u> |
| Pressure Gauge | <u></u> |

SAMPLING CONDITIONS

| | | |
|---|------------------|--|
| Flowing Tubing Pressure | <u>236</u> | <u>Bar A</u> |
| Flowing Bottom Hole Pressure | <u>375</u> | <u>Bar A</u> |
| Primary Separator Pressure | <u>69</u> | <u>Bar A</u> |
| Primary Separator Temperature | <u>36</u> | <u>°C</u> |
| Secondary Separator Pressure | <u></u> | <u>Bar G</u> |
| Secondary Separator Temperature | <u></u> | <u>°C</u> |
| Field Stock Tank Liquid Density | <u>0.8007</u> | <u>Kg/m³ @ 15 °C</u> |
| Primary Separator Gas Production Rate | <u>470.91</u> | <u>m³x10⁶ /Day</u> |
| Pressure Base | <u>1.01325</u> | <u>Bar A</u> |
| Temperature Base | <u>15</u> | <u>°C</u> |
| Compressibility Factor (Fpv) | <u>1.0654</u> | |
| Gas Gravity (Laboratory) | <u>0.662</u> | |
| Gas Gravity Factor (Fg) | <u>1.2291</u> | |
| Separator Liquid Production Rate @69 Bar A and 36°C | <u>151.2</u> | <u>m³ /Day</u> |
| Primary Separator Gas/ Separator Liquid Ratio | <u>3114</u> | <u>Sm³/m³</u> |
| or | <u>0.946</u> | <u>m³/Sm³x10⁶</u> |
| Sampled by | <u>FLOPETROL</u> | |

REMARKS: Third set of samples

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Hydrocarbon Analysis of Separator Products and Calculated Well Stream.

| <u>Component</u> | <u>Separator Liquid</u> | <u>Separator Gas</u> | <u>m³/10⁶m³</u> | <u>Well Stream</u> | <u>m³/10⁶m</u> |
|------------------|-------------------------|----------------------|--|--------------------|--------------------------------------|
| | <u>Mol %</u> | <u>Mol %</u> | | <u>Mol %</u> | |
| Hydrogen Sulfide | NIL | NIL | | NIL | |
| Carbon Dioxide | 1.20 | 2.48 | | 2.41 | |
| Nitrogen | Trace | 0.71 | | 0.67 | |
| Methane | 23.17 | 87.94 | | 84.48 | |
| Ethane | 4.43 | 4.60 | 163.10 | 4.59 | 162.74 |
| Propane | 5.73 | 2.34 | 85.81 | 2.52 | 92.41 |
| iso-Butane | 1.58 | 0.38 | 16.55 | 0.44 | 19.16 |
| n-Butane | 4.06 | 0.71 | 29.79 | 0.89 | 37.35 |
| iso-Pentane | 1.99 | 0.21 | 10.24 | 0.31 | 15.12 |
| n-Pentane | 3.47 | 0.21 | 10.14 | 0.38 | 18.35 |
| Hexanes | 4.88 | 0.16 | 8.77 | 0.41 | 22.47 |
| Heptanes | 7.71 | 0.14 | 7.34 | 0.55 | 28.85 |
| Octanes | 8.28 | 0.05 | 2.80 | 0.49 | 27.46 |
| Nonanes | 6.80 | 0.05 | 3.11 | 0.41 | 25.52 |
| Decanes Plus | 26.70 | 0.02 | 1.64 | 1.45 | 138.62 |
| | <u>100.00</u> | <u>100.00</u> | <u>339.29</u> | <u>100.00</u> | <u>588.05</u> |

Properties of Heptanes Plus

| | | | |
|-----------------------------------|-------|-----|-----|
| Density, kg/m ³ (15°C) | 804.2 | 737 | 800 |
| Molecular Weight | 150 | 105 | 146 |

Calculated separator gas gravity (air=1.000) = 0.662
 Calculated gross heating value for separator gas = 41.09 MJ
 per cubic metre of dry gas at 1.01325 Bar A and 15°C.

Primary separator gas collected at 68 Bar G and 36°C.
 Primary separator liquid collected at 68 Bar G and 36°C.

Primary separator gas/separator liquid ratio = 3114 m³/m³ at 36°C.
 Primary separator gas/well stream ratio = 0.946 m³/m³.

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Measured Properties of Liquid Fractions
From Hydrocarbon Analysis of Separator Liquid.

| <u>Fraction</u> | <u>Molecular Weight</u> | <u>Density Kg/m³ at 15°C.</u> |
|-----------------|-------------------------|--|
| Heptanes | 91 | 732.2 |
| Octanes | 100 | 753.3 |
| Nonanes | 113 | 766.2 |
| Decanes Plus | 186 | 821.3 |

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Pressure-Volume Relations at 132.5°C...

| <u>PRESSURE</u> <u>BAR A</u> | <u>RELATIVE</u> <u>VOLUME (1)</u> | <u>DEVIATION</u> <u>FACTOR</u> | <u>RETROGRADE LIQUID</u> <u>VOLUME (2)</u> |
|---------------------------------|--------------------------------------|-----------------------------------|---|
| 449.2 | 0.8872 | 1.162 | |
| 414.7 | 0.9269 | 1.120 | |
| 400.9 | 0.9450 | 1.104 | |
| 387.1 | 0.9645 | 1.088 | |
| 380.2 | 0.9751 | 1.081 | |
| 378.0 | 0.9786 | 1.078++ | |
| 373.3 | 0.9845 | 1.073 | |
| 365.8 | 1.0000 | 1.066+ | 0.00 |
| 359.5 | 1.0082 | | 0.09 |
| 352.6 | 1.0211 | | 0.18 |
| 345.8 | 1.0358 | | 0.27 |
| 338.9 | 1.0489 | | 0.36 |
| 332.0 | 1.0635 | | 0.42 |
| 325.1 | 1.0795 | | 0.48 |
| 318.2 | 1.0962 | | 0.53 |
| 304.4 | 1.1324 | | 0.68 |
| 290.6 | 1.1732 | | 0.83 |
| 276.8 | 1.2193 | | 1.00 |
| 249.3 | 1.3285 | | 1.51 |
| 221.6 | 1.4716 | | 2.09 |
| 194.1 | 1.6627 | | 2.86 |
| 166.5 | 1.9283 | | |
| 125.1 | 2.5677 | | |
| 94.1 | 3.4416 | | |
| 66.2 | 4.9561 | | |

++ Gas Formation Volume Factor = $247 \text{ Sm}^3 / \text{m}^3$
 + Gas Formation Volume Factor = $241 \text{ Sm}^3 / \text{m}^3$

- (1) Relative Volume : V/V_{sat} is volume at indicated pressure per volume at saturation pressure.
- (2) Retrograde Liquid Volume : Liquid volume as percent of saturated volume.

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Depletion Study at 132.5°C.

Hydrocarbon Analysis of Produced Well Stream - Mol Percent

| Component | Reservoir Pressure - Bar A | | | | | | | | | |
|--|----------------------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|----------|
| | 365.8 | 332.0 | 283.7 | 235.5 | 187.2 | 138.9 | 90.6 | 49.3 | 25.1+ | <u>1</u> |
| Carbon Dioxide | 2.41 | 2.40 | 2.39 | 2.39 | 2.39 | 2.40 | 2.41 | 2.42 | 2.43 | |
| Nitrogen | 0.67 | 0.68 | 0.69 | 0.70 | 0.70 | 0.68 | 0.64 | 0.60 | 0.58 | |
| Methane | 84.48 | 84.89 | 85.44 | 85.81 | 86.05 | 86.18 | 86.13 | 85.70 | 84.59 | |
| Ethane | 4.59 | 4.53 | 4.46 | 4.45 | 4.45 | 4.47 | 4.51 | 4.55 | 4.64 | |
| Propane | 2.52 | 2.50 | 2.44 | 2.40 | 2.39 | 2.42 | 2.46 | 2.56 | 2.64 | |
| iso-Butane | 0.44 | 0.43 | 0.42 | 0.41 | 0.41 | 0.40 | 0.42 | 0.44 | 0.48 | |
| n-Butane | 0.89 | 0.88 | 0.87 | 0.86 | 0.86 | 0.86 | 0.87 | 0.91 | 1.09 | |
| iso-Pentane | 0.31 | 0.30 | 0.29 | 0.28 | 0.27 | 0.27 | 0.29 | 0.33 | 0.41 | |
| n-Pentane | 0.38 | 0.36 | 0.35 | 0.34 | 0.33 | 0.33 | 0.36 | 0.42 | 0.50 | |
| Hexanes | 0.41 | 0.40 | 0.38 | 0.36 | 0.34 | 0.33 | 0.35 | 0.42 | 0.55 | |
| Heptanes | 0.55 | 0.53 | 0.50 | 0.48 | 0.48 | 0.47 | 0.48 | 0.54 | 0.68 | |
| Octanes | 0.49 | 0.47 | 0.43 | 0.40 | 0.38 | 0.37 | 0.36 | 0.39 | 0.49 | |
| Nonanes | 0.41 | 0.38 | 0.34 | 0.31 | 0.29 | 0.27 | 0.26 | 0.27 | 0.33 | |
| Decanes Plus | 1.45 | 1.25 | 1.00 | 0.81 | 0.66 | 0.55 | 0.46 | 0.45 | 0.59 | |
| | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | <u>100.00</u> | |
| <u>Properties of heptanes plus</u> | | | | | | | | | | |
| Molecular weight | 146 | 131 | 124 | 118 | 115 | 113 | 112 | 114 | 116 | |
| Density | 0.800 | 0.786 | 0.781 | 0.772 | 0.769 | 0.767 | 0.766 | 0.768 | 0.771 | |
| <u>Deviation Factor - Z</u> | | | | | | | | | | |
| Equilibrium gas | 1.066 | 1.030 | 0.991 | 0.962 | 0.946 | 0.944 | 0.962 | 0.977 | | |
| Two-phase | 1.066 | 1.028 | 0.987 | 0.959 | 0.933 | 0.917 | 0.908 | 0.894 | | |
| Well Stream produced- Cumulative % of initial | 0.000 | 5.874 | 16.236 | 28.465 | 40.965 | 55.697 | 70.893 | 83.927 | | 98.887 |

+ Mid-Point of Producing Interval

Disse analysene, eller tolkningene baseres på observasjoner og materiell skaffet til veie av klienter, som denne rapporten eksklusivt og fortrolig er laget for. Det utførte arbeidet representerer de beste tolkninger Core Laboratories Norsk er i stand til å gi, (med forbehold om feil og utelatelser). Likevel frasier Core Laboratories Norsk og Deres personell seg all ansvar og gir derfor ingen overslag på grunnlag av disse data, som f.eks produktivitet, aktuelle operasjoner, og lønnsomhet fra en hver olje, gass eller mineral brønn eller sand, som en slik rapport er basert på.

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Calculated Cumulative Recovery During Depletion

| Cumulative Recovery per $\text{Sm}^3 \times 10^6$ of Original Fluid | Initial in place | Reservoir Pressure - Bar A | | | | | | | |
|--|---------------------|----------------------------|--------------|--------------|--------------|--------------|--------------|-------------|-------------|
| | | <u>365.8+</u> | <u>332.0</u> | <u>283.7</u> | <u>235.5</u> | <u>187.2</u> | <u>138.9</u> | <u>90.6</u> | <u>49.3</u> |
| <u>Well Stream - $\text{Sm}^3 \times 10^3$</u> | 1000 | 0 | 58.74 | 162.36 | 284.65 | 409.65 | 556.97 | 708.93 | 839.27 |
| <u>Normal Temperature Separation ++</u> | | | | | | | | | |
| Stock Tank Liquid - m | 241.10 | 0 | 11.78 | 28.73 | 45.61 | 60.75 | 76.78 | 92.41 | 106.08 |
| Primary Separator Gas - $\text{Sm}^3 \times 10^3$ | 939.61 | 0 | 55.51 | 154.26 | 271.49 | 391.83 | 534.13 | 681.08 | 808.59 |
| Stock Tank Gas - $\text{Sm}^3 \times 10^3$ | 26.10 | 0 | 1.42 | 3.60 | 5.88 | 7.98 | 10.29 | 12.61 | 13.12 |
| <u>Total "Plant Products" in Primary Separator Gas - m</u> +++ | | | | | | | | | |
| Ethane | 151.91 | 0 | 8.86 | 24.37 | 42.74 | 61.60 | 84.05 | 107.44 | 128.19 |
| Propane | 78.22 | 0 | 4.62 | 12.73 | 22.32 | 32.20 | 44.10 | 56.60 | 68.39 |
| Butanes (total) | 40.35 | 0 | 2.41 | 6.77 | 12.00 | 17.42 | 23.89 | 30.76 | 37.59 |
| Pentanes plus | 36.39 | 0 | 2.24 | 6.49 | 11.54 | 16.78 | 22.89 | 29.72 | 37.79 |
| <u>Total "Plant Products" in Stock Tank Gas - m</u> +++ | | | | | | | | | |
| Ethane | 10.39 | 0 | 0.55 | 1.39 | 2.26 | 3.06 | 3.93 | 4.82 | 5.04 |
| Propane | 11.62 | 0 | 0.63 | 1.57 | 2.55 | 3.46 | 4.46 | 5.48 | 5.74 |
| Butanes (total) | 9.34 | 0 | 0.51 | 1.30 | 2.13 | 2.92 | 3.78 | 4.67 | 4.87 |
| Pentanes plus | 7.19 | 0 | 0.41 | 1.05 | 1.73 | 2.37 | 3.08 | 3.86 | 4.03 |
| <u>Total "Plant Products" in Well Stream - m</u> +++ | | | | | | | | | |
| Ethane | 162.74 | 0 | 9.43 | 25.82 | 45.11 | 64.84 | 88.19 | 112.48 | 133.51 |
| Propane | 92.41 | 0 | 5.39 | 14.66 | 25.42 | 36.38 | 49.45 | 63.16 | 75.39 |
| Butanes (total) | 56.51 | 0 | 3.27 | 8.95 | 15.54 | 22.29 | 30.17 | 38.50 | 45.97 |
| Pentanes plus | 279.34 | 0 | 14.04 | 35.18 | 57.05 | 77.30 | 99.46 | 121.79 | 143.01 |

+ Saturation Pressure

++ Separation Basis: Primary Stage 68.6 Bar G at 36°C, Stock Tank 0 Bar G at 15°C. (Final point primary stage: 20.7 Bar G at 36°C).

+++ Assumes 100% Plant efficiency.

Disse analysene, eller tokningene baseres på observasjoner og materiell skaffet til veie av klienter, som denne rapporten eksklusivt og fortrolig er laget for. Det utførte arbeidet representerer de beste tolkninger Core Laboratories Norsk er i stand til å gi, (med forbehold om feil og utelatelser). Likevel frasier Core Laboratories Norsk og deres personell seg alt ansvar og gir derfor ingen overslag på grunnlag av disse data, som f.eks produktivitet, aktuelle operasjoner, og lønnsomhet fra en hver olje, gass eller mineral brønn eller sand, som en slik rapport er basert på.

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Calculated Instantaneous Recovery During Depletion.

| | Reservoir Pressure - Bar A | | | | | | | |
|--|----------------------------|--------------|--------------|--------------|--------------|--------------|-------------|-------------|
| | <u>365.8+</u> | <u>332.0</u> | <u>283.7</u> | <u>235.5</u> | <u>187.2</u> | <u>138.9</u> | <u>90.6</u> | <u>49.3</u> |
| <u>Normal Temperature Separation ++</u> | | | | | | | | |
| Stock Tank Liquid Density, Kg/m ³ at 15°C | 777.2 | 759.6 | 753.6 | 745.0 | 741.9 | 739.5 | 736.7 | 737.5 |
| Separator Gas/Well Stream Ratio, Sm ³ /Sm ³ | 0.9396 | 0.9451 | 0.9529 | 0.9586 | 0.9628 | 0.9659 | 0.9670 | 0.9783 |
| Separator Gas/Stock Tank Liquid Ratio, Sm ³ /m ³ | 3897 | 4713 | 5826 | 6945 | 7952 | 8875 | 9399 | 9332 |
| <u>m³/m³ x 10⁶ from Smooth Well Stream Compositions</u> | | | | | | | | |
| Ethane plus | 591.00 | 546.90 | 506.44 | 478.57 | 461.35 | 451.16 | 451.90 | 475.32 |
| Propane plus | 428.26 | 386.29 | 348.27 | 320.79 | 303.57 | 292.67 | 291.99 | 314.00 |
| Butanes plus | 335.85 | 294.61 | 258.80 | 232.78 | 215.93 | 203.92 | 201.78 | 220.12 |
| Pentanes plus | 279.34 | 238.96 | 204.00 | 178.84 | 161.99 | 150.42 | 146.98 | 162.77 |

+ Saturation Pressure

++ Separation Basis: Primary Stage 68.6 Bar G at 36°C, Stock Tank 0 Bar G at 15°C,
except the 49.3 Bar A Well Stream where the primary stage is 20.7 Bar G at 36°C.

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RETROGRADE CONDENSATION DURING GAS DEPLETION AT 132.5°C.

| <u>Pressure</u> <u>Bar A</u> | <u>Retrograde Liquid Volume,</u> <u>Percent of Hydrocarbon Pore Space</u> |
|----------------------------------|--|
| <u>365.8</u> Dew Point Pressure | 0.0 |
| 359.6 | 0.1 |
| 352.7 | 0.2 |
| 345.8 | 0.3 |
| 338.9 | 0.4 |
| <u>332.0</u> 1st Depletion Level | 0.4 |
| 283.7 | 1.0 |
| 235.5 | 1.7 |
| 187.2 | 2.7 |
| 138.9 | 3.1 |
| 90.6 | 3.0 |
| 49.3 | 2.9 |
| 0 | 2.8 |

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Calculated Gas Viscosity at 132.5°C.

| <u>Pressure</u> <u>Bar A</u> | | <u>Gas Viscosity,</u> <u>Pascal-Seconds x 10⁻³+</u> |
|---------------------------------|--------------------|---|
| <u>378.0</u> | Reservoir Pressure | 0.0278 |
| <u>365.8</u> | Dew Point Pressure | 0.0272 |
| 332.0 | | 0.0249 |
| 283.7 | | 0.0224 |
| 235.5 | | 0.0202 |
| 187.2 | | 0.0184 |
| 138.9 | | 0.0167 |
| 90.6 | | 0.0151 |
| 49.3 | | 0.0138 |

+ Calculated using the correlation of Carr, Kobayashi
and Burrows, Aime Transactions, 1954, Vol 201, p264.

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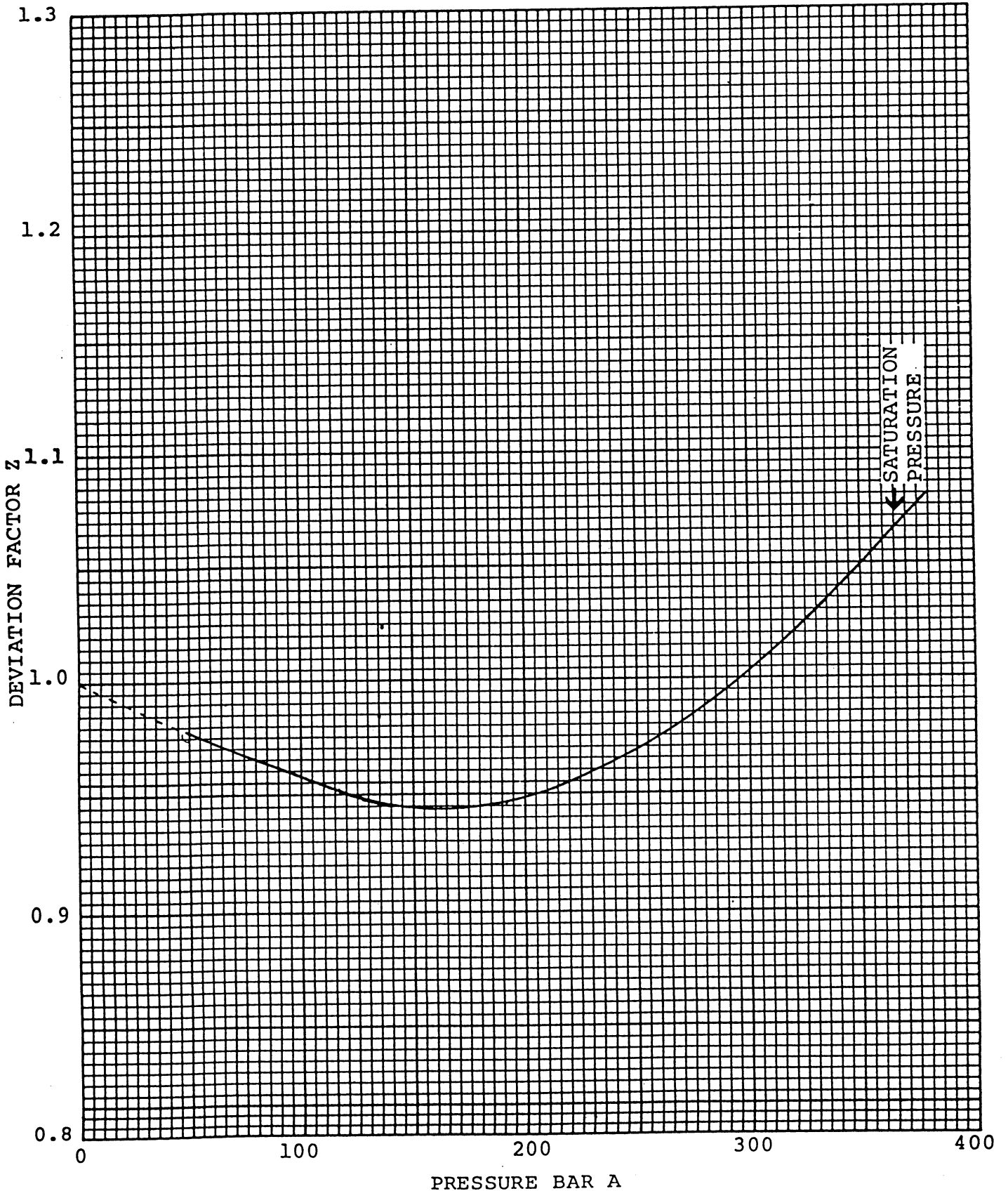
Hydrocarbon Analysis of Depletion Residual Liquid.

| <u>Component</u> | <u>Mol Percent</u> | <u>Weight Percent</u> |
|------------------|------------------------|---------------------------|
| Carbon Dioxide | NIL | NIL |
| Nitrogen | NIL | NIL |
| Methane | NIL | NIL |
| Ethane | NIL | NIL |
| Propane | NIL | NIL |
| Butane | 0.01 | TRACE |
| Pentanes | 0.24 | 0.09 |
| Hexanes | 0.96 | 0.46 |
| Heptanes | 4.20 | 2.19 |
| Octanes | 8.38 | 5.12 |
| Nonanes | 9.66 | 6.62 |
| Decanes | 76.55 | 85.52 |
| | <hr/> | <hr/> |
| | 100.00 | 100.00 |
| | <hr/> | <hr/> |

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DEVIATION FACTOR Z OF WELLSTREAM DURING DEPLETION AT 132.5°C

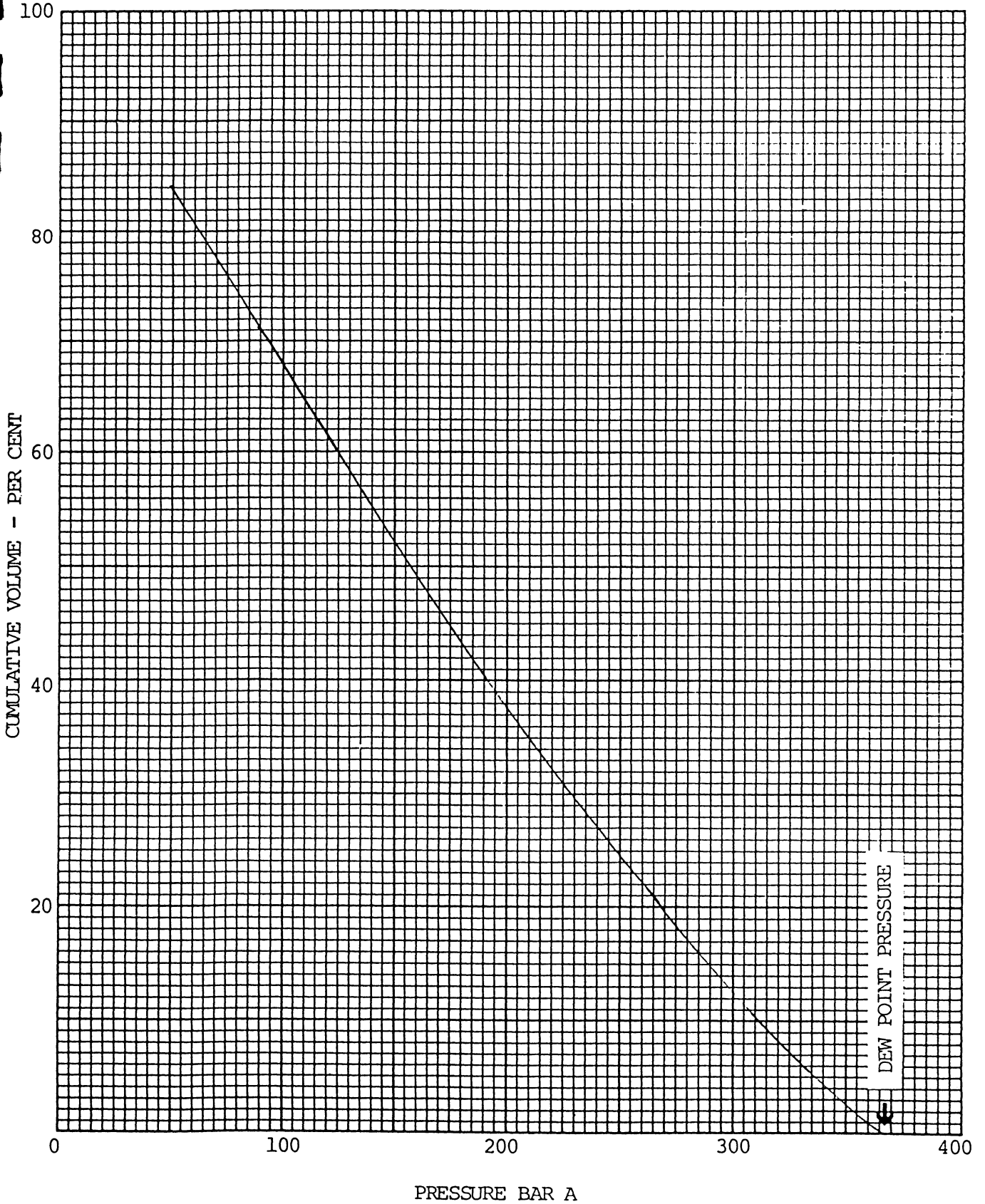
| | | | |
|---------|-------------------|-----------|--------|
| Company | STATOIL | Formation | _____ |
| Well | 6407/1-3 DST No.2 | Province | _____ |
| Field | Tyrihans | Country | Norway |



BERGEN, NORWAY

VOLUME OF WELL STREAM PRODUCED DURING DEPLETION

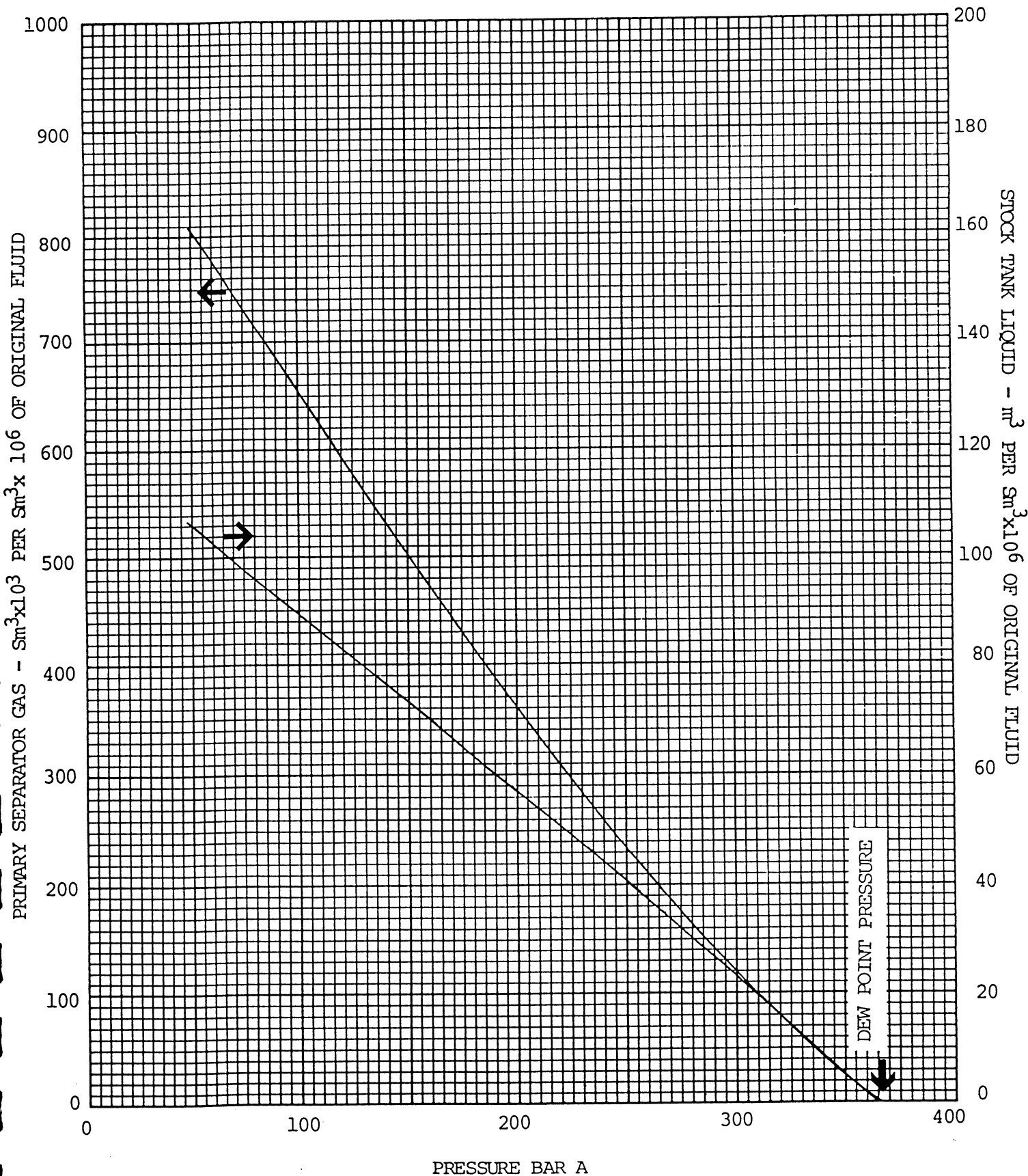
Company Statoil Formation _____
Well 6407/1-3 DST No. 2 Province _____
Field Tyrihans Country Norway



BERGEN, NORWAY

CUMULATIVE RECOVERY DURING DEPLETION

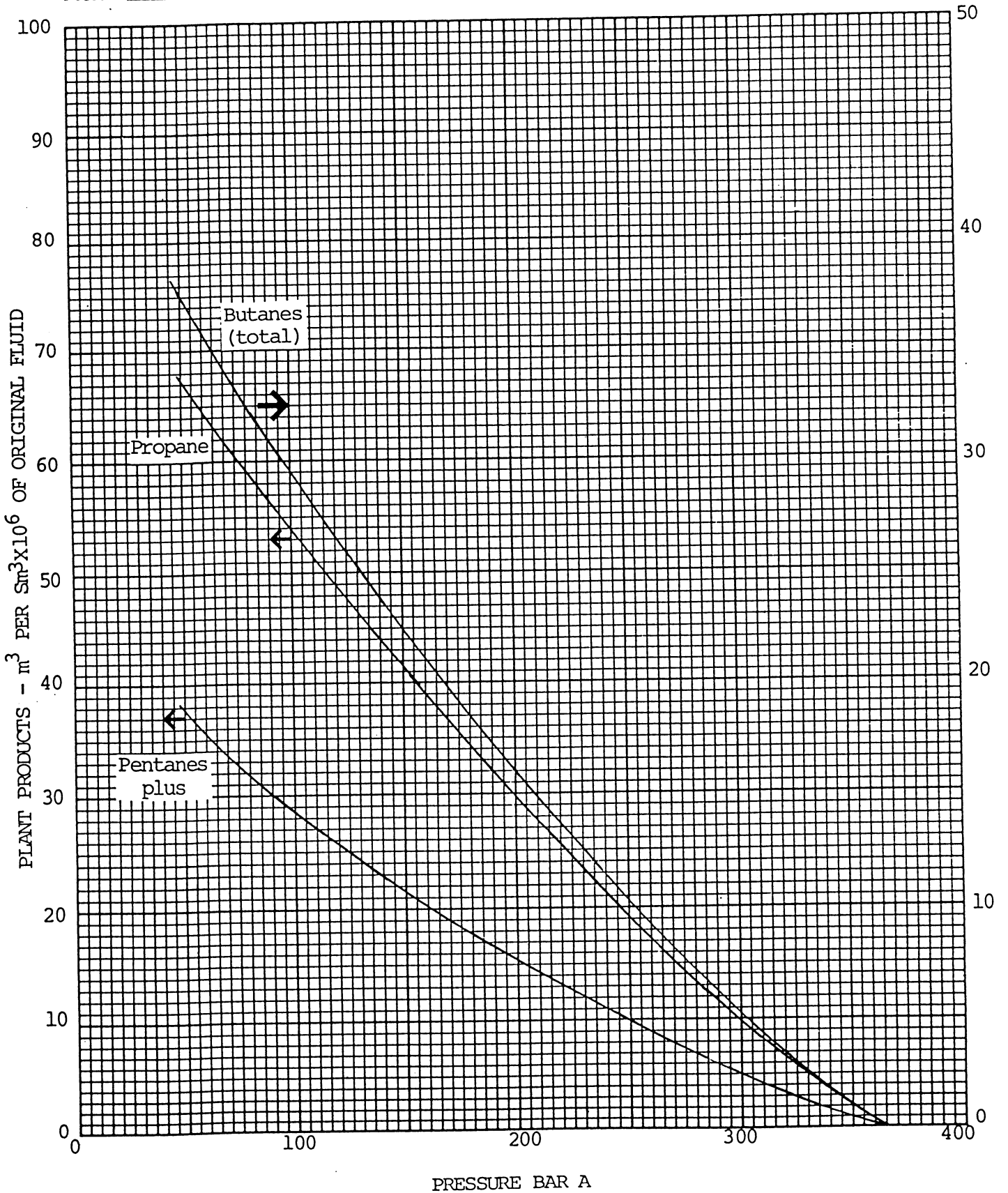
| | | | |
|---------|--------------------|-----------|--------|
| Company | Statoil | Formation | |
| Well | 6407/1-3 DST No. 2 | Province | |
| Field | Tyrihans | Country | Norway |



BERGEN, NORWAY

CUMULATIVE RECOVERY-PLANT PRODUCTS IN PRIMARY SEPARATOR GAS

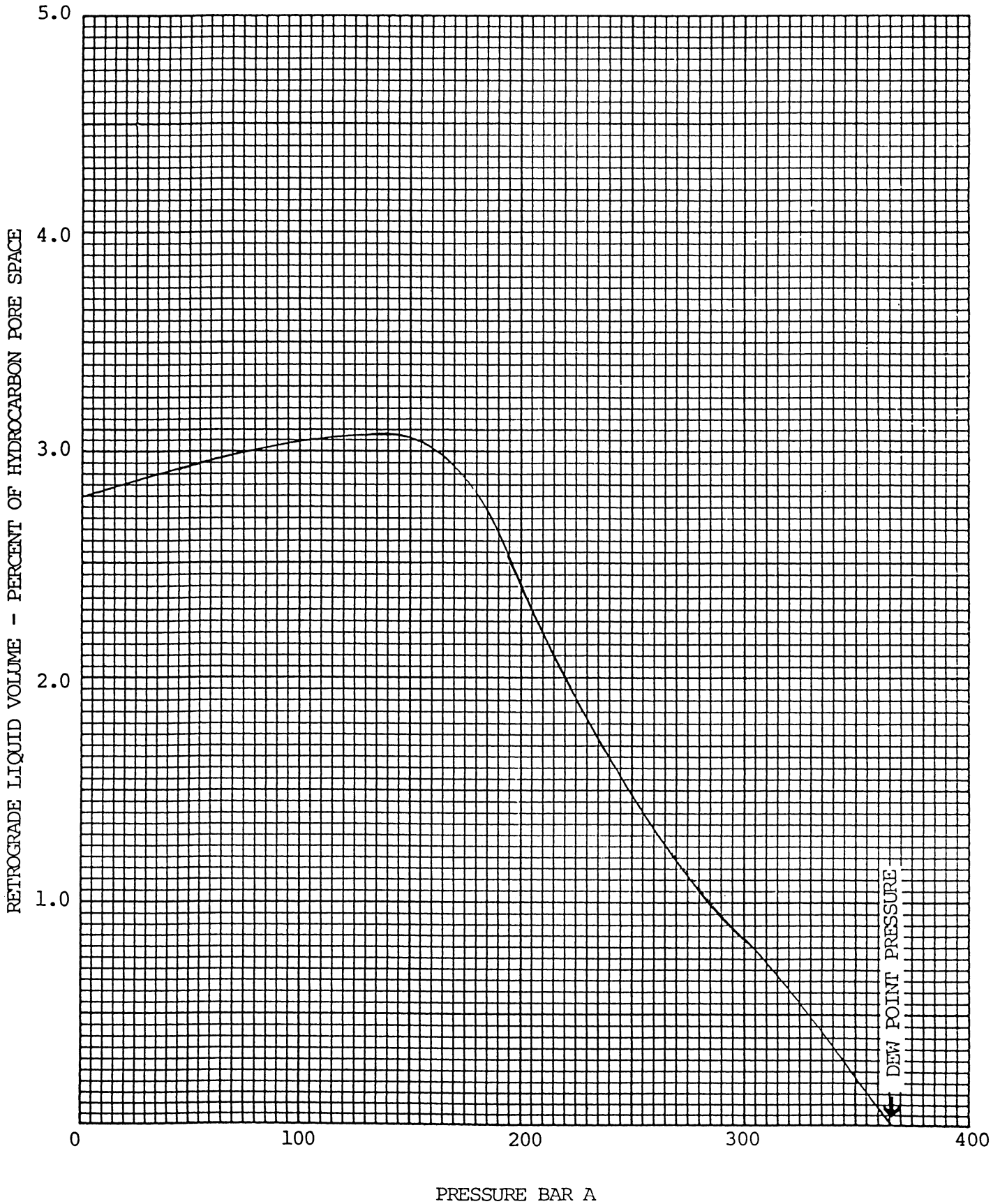
Company Statoil Formation _____
 Well 6407/1-3 DST No 2 Province _____
 Field Tyrihans Country Norway



BERGEN, NORWAY

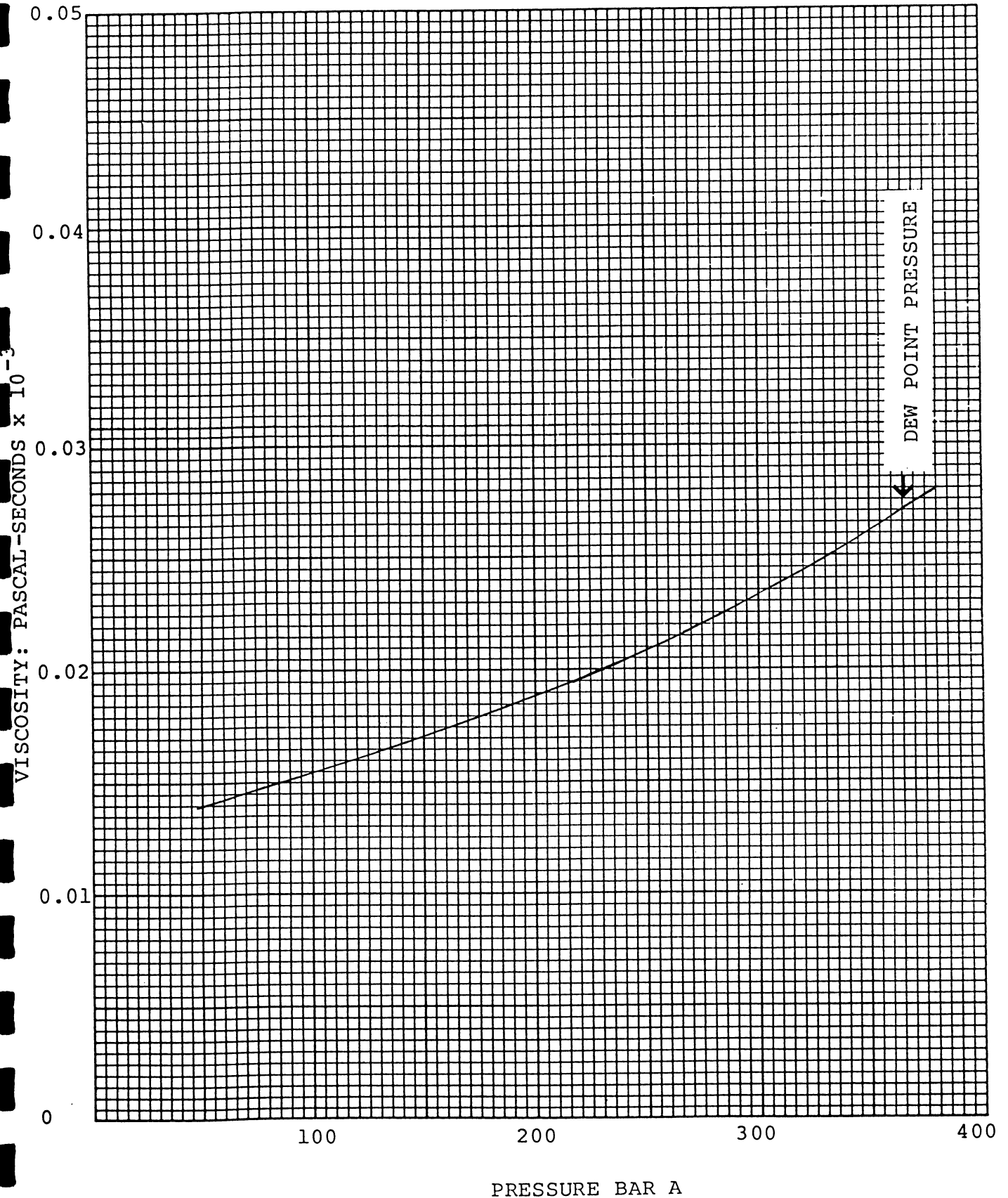
RETROGRADE CONDENSATION DURING DEPLETION AT 132.5°C

Company Statoil Formation _____
Well 6407/1-3 DST No 2 Province _____
Field Tyrihans Country Norway



CALCULATED GAS VISCOSITY AT 132.5°C.

Company STATOIL Formation _____
Well 6407/1-3 DST NO. 2 Province _____
Field TYRIHANS Country NORWAY



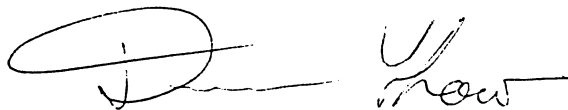
CORE LABORATORIES
Petroleum Reservoir Engineering
CCB, ÅGOTNES

Statoil

RFLN 840009

Well: 6407/1-3 DST No.2

Core Laboratories Norsk
Reservoir Fluid Analysis

A handwritten signature in black ink, appearing to read 'Duncan Thow'. The signature is fluid and cursive, with a large loop at the beginning and a long horizontal stroke at the end.

Duncan Thow
RFL Operations Supervisor