

Denne rapport  
tilhører



**L&U DOK. SENTER**

L. NR. 30285270061

KODE Well 31/2-5 nr 17

Returneres etter bruk

SUPPLEMENTARY REPORT

for

A/S Norske Shell Exploration & Production

Well: 31/2-5

North Sea, Norway.

**CORE LABORATORIES UK LTD.**  
*Petroleum Reservoir Engineering*  
**ABERDEEN, SCOTLAND**

---

25

**SUPPLEMENTARY REPORT**

for

**A/S Norske Shell Exploration & Production**

**Well: 31/2-5**

**North Sea, Norway.**

**CORE LABORATORIES UK LTD.**

*Petroleum Reservoir Engineering*

**ABERDEEN, SCOTLAND**

22nd April 1981

A/S Norske Shell Exploration & Production  
Damsle Ferusuei 43  
P.O. Box 10  
40-33 Forus  
Norway

Subject: Supplementary Report  
Well: 31/2-5  
North Sea, Norway.  
Our File Number:  
RFLA 81028A

Attention: Mr. Dave Jolly.

Gentlemen,

On the 16th March 1981 a report containing the results of a reservoir fluid study was issued from our Aberdeen laboratory (Our File RFLA 81028). The following report contains the results of further analysis as requested.

The extended hydrocarbon composition of the reservoir fluid was determined by the use of both high and low temperature fractional distillation and these data may be found on page two.

A flash separation was performed in the laboratory at conditions specified by A/S Norske Shell. The factors and data derived from this test may be found on page three.

The primary separator gas was collected and analysed for hydrocarbon composition by gas chromatography. This composition is presented on page four.

A portion of the primary separator liquid was analysed for hydrocarbon composition by low temperature fractional distillation. This composition in terms of both mol and weight percent through hexanes may be found on page five.

The hydrocarbon composition of the stock tank oil was determined by low temperature fractional distillation. This composition in terms of both mol and weight percent may be found on page six.

It has been a pleasure to be of service to A/S Norske Shell Exploration & Production. Should any questions arise concerning data presented in this report, or if we can be of further assistance, please do not hesitate to contact us.

Yours very truly

Core Laboratories UK Limited  
Reservoir Fluid Analysis



Les. K. Sebborn  
Laboratory Manager

LKS/STB  
15cc/Addressee

**CORE LABORATORIES UK LTD.**  
*Petroleum Reservoir Engineering*  
**ABERDEEN, SCOTLAND**

Page 1 of 6

File RFLA 81028A

Company A/S Norske Shell Expl. & Prod. Date Sampled \_\_\_\_\_

Well 31/2-5 State North Sea

Field \_\_\_\_\_ Country Norway

**FORMATION CHARACTERISTICS**

|                                    |                        |
|------------------------------------|------------------------|
| Formation Name                     | _____                  |
| Date First Well Completed          | _____, 19____          |
| Original Reservoir Pressure        | _____ PSIG @ _____ Ft. |
| Original Produced Gas-Oil Ratio    | _____ SCF/Bbl          |
| Production Ratio                   | _____ Bbl/Day          |
| Separator Pressure and Temperature | _____ PSIG _____ °F.   |
| Oil Gravity at 60°F.               | _____ °API             |
| Datum                              | _____ Ft. Subsea       |
| Original Gas Cap                   | _____                  |

**WELL CHARACTERISTICS**

|                                    |                         |         |
|------------------------------------|-------------------------|---------|
| Elevation                          | _____                   | Ft.     |
| Total Depth                        | _____                   | Ft.     |
| Producing Interval                 | _____                   | Ft.     |
| Tubing Size and Depth              | _____ In. to _____      | Ft.     |
| Productivity Index                 | _____ Bbl/D/PSI @ _____ | Bbl/Day |
| Last Reservoir Pressure            | 2280 PSIG @ _____       | Ft.     |
| Date                               | _____, 19____           |         |
| Reservoir Temperature              | 160 °F. @ _____         | Ft.     |
| Status of Well                     | _____                   |         |
| Pressure Gauge                     | _____                   |         |
| Normal Production Rate             | _____                   | Bbl/Day |
| Gas-Oil Ratio                      | _____                   | SCF/Bbl |
| Separator Pressure and Temperature | _____ PSIG, _____       | °F.     |
| Base Pressure                      | _____                   | PSIA    |
| Well Making Water                  | _____                   | % Cut   |

**SAMPLING CONDITIONS**

|                                    |                     |         |
|------------------------------------|---------------------|---------|
| Sampled at                         | _____               | Ft.     |
| Status of Well                     | _____               |         |
| Gas-Oil Ratio                      | _____               | SCF/Bbl |
| Separator Pressure and Temperature | _____ PSIG, _____   | °F.     |
| Tubing Pressure                    | _____               | PSIG    |
| Casing Pressure                    | _____               | PSIG    |
| Sampled by                         | <u>Schlumberger</u> |         |
| Type Sampler                       | <u>Schlumberger</u> |         |

**REMARKS:**

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgement of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

**CORE LABORATORIES UK LTD.**  
*Petroleum Reservoir Engineering*  
**ABERDEEN, SCOTLAND**

Page 2 of 6

File RFLA 81028A

Company A/S Norske Shell Expl. & Prod. Formation \_\_\_\_\_  
 Well 31/2-5 County North Sea  
 Field \_\_\_\_\_ State Norway

HYDROCARBON ANALYSIS OF RESERVOIR FLUID SAMPLE\*

| COMPONENT        | MOL<br>PERCENT | WEIGHT<br>PERCENT | DENSITY | API  | MOL<br>WEIGHT |
|------------------|----------------|-------------------|---------|------|---------------|
| Hydrogen Sulfide | NIL            | NIL               |         |      |               |
| Carbon Dioxide   | 0.81           | 0.25              |         |      |               |
| Nitrogen         | 0.72           | 0.14              |         |      |               |
| Methane          | 35.27          | 3.97              |         |      |               |
| Ethane           | 4.00           | 0.84              |         |      |               |
| Propane          | 1.34           | 0.41              |         |      |               |
| iso-Butane       | 1.14           | 0.47              |         |      |               |
| n-Butane         | 0.47           | 0.19              |         |      |               |
| iso-Pentane      | 0.54           | 0.27              |         |      |               |
| n-Pentane        | 0.24           | 0.12              |         |      |               |
| Hexanes          | 1.15           | 0.69              |         |      |               |
| Heptanes         | 6.20           | 4.20              | 0.7609  | 54.3 | 94            |
| Octanes          | 3.41           | 2.65              | 0.7825  | 49.2 | 108           |
| Nonanes          | 2.71           | 2.35              | 0.8056  | 44.0 | 120           |
| Decanes          | 4.69           | 4.43              | 0.8158  | 41.8 | 131           |
| Undecanes Plus   | 37.31          | 79.02             | 0.9088  | 24.1 | 294           |
|                  | <u>100.00</u>  | <u>100.00</u>     |         |      |               |

\*Cylinder Number 80397.

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgement of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitability of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

**CORE LABORATORIES UK LTD.**  
*Petroleum Reservoir Engineering*  
**ABERDEEN, SCOTLAND**

Page 3 of 6

File RFLA 81028A

Well 31/2-5

SEPARATOR TESTS OF RESERVOIR FLUID SAMPLE

| Separator Pressure<br>PSI Gauge | Separator Temperature<br>°F. | Gas/Oil Ratio<br>(1) | Gas/Oil Ratio<br>(2) | Stock Tank Gravity<br>°API @ 60°F. | Formation Volume<br>Factor(3) | Separator Volume<br>Factor(4) | Specific Gravity of<br>Flashed Gas |
|---------------------------------|------------------------------|----------------------|----------------------|------------------------------------|-------------------------------|-------------------------------|------------------------------------|
| 450                             | 68                           | 244                  | 254                  |                                    |                               | 1.042                         | 0.611*                             |
| to<br>0                         | 68                           | 113                  | 114                  | 28.8                               | 1.185                         | 1.003                         | 0.797                              |

\* Gas collected and analysed for hydrocarbon composition.

- (1) Gas/Oil Ratio in cubic feet of gas at 14.73 psia and 60°F. per barrel of oil at indicated pressure and temperature.
- (2) Gas/Oil Ratio in cubic feet of gas at 14.73 psia and 60°F. per barrel of stock tank oil at 60°F.
- (3) Formation Volume Factor is barrels of saturated oil at 2280 psig and 160°F. per barrel of stock tank oil at 60°F.
- (4) Separator Volume Factor is barrels of oil at indicated pressure and temperature per barrel of stock tank oil at 60°F.

**CORE LABORATORIES UK LTD.**  
*Petroleum Reservoir Engineering*  
**ABERDEEN, SCOTLAND**

Page 4 of 6

File RFLA 81028A

Company A/S Norske Shell Expl. & Prod. Formation \_\_\_\_\_

Well 31/2-5 County North Sea

Field \_\_\_\_\_ State Norway

HYDROCARBON ANALYSIS OF SEPARATOR GAS SAMPLE

| COMPONENT        | MOL PERCENT   | GPM          |
|------------------|---------------|--------------|
| Hydrogen Sulfide | NIL           |              |
| Carbon Dioxide   | 1.66          |              |
| Nitrogen         | 0.96          |              |
| Methane          | 91.45         |              |
| Ethane           | 4.80          |              |
| Propane          | 0.71          | 0.195        |
| iso-Butane       | 0.24          | 0.079        |
| n-Butane         | 0.06          | 0.019        |
| iso-Pentane      | 0.05          | 0.018        |
| n-Pentane        | 0.01          | 0.004        |
| Hexanes          | 0.03          | 0.012        |
| Heptanes plus    | 0.03          | 0.014        |
|                  | <u>100.00</u> | <u>0.341</u> |

Calculated gas gravity (air = 1.000) = 0.611

Calculated gross heating value = 1044 BTU per cubic foot of dry gas at 14.73 psia and 60°F.

Collected at 450 psig and 68°F.

**CORE LABORATORIES UK LTD.**  
*Petroleum Reservoir Engineering*  
**ABERDEEN, SCOTLAND**

Page 5 of 6

File RFLA 81028A

Company A/S Norske Shell Expl. & Prod. Formation \_\_\_\_\_

Well 31/2-5 County North Sea

Field \_\_\_\_\_ State Norway

HYDROCARBON ANALYSIS OF PRIMARY SEPARATOR OIL SAMPLE

| COMPONENT        | MOL<br>PERCENT | WEIGHT<br>PERCENT | DENSITY | API  | MOL<br>WEIGHT |
|------------------|----------------|-------------------|---------|------|---------------|
| Hydrogen Sulfide | NIL            | NIL               |         |      |               |
| Carbon Dioxide   | 0.45           | 0.10              |         |      |               |
| Nitrogen         | 0.62           | 0.09              |         |      |               |
| Methane          | 11.73          | 0.97              |         |      |               |
| Ethane           | 3.67           | 0.57              |         |      |               |
| Propane          | 1.60           | 0.36              |         |      |               |
| iso-Butane       | 1.52           | 0.45              |         |      |               |
| n-Butane         | 0.64           | 0.19              |         |      |               |
| iso-Pentane      | 0.75           | 0.28              |         |      |               |
| n-Pentane        | 0.29           | 0.11              |         |      |               |
| Hexanes          | 1.62           | 0.71              |         |      |               |
| Heptanes plus    | <u>77.11</u>   | <u>96.17</u>      | 0.8872  | 27.8 | 243           |
|                  | <u>100.00</u>  | <u>100.00</u>     |         |      |               |

These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgement of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.



**CORE LABORATORIES UK LTD.**  
*Petroleum Reservoir Engineering*  
**ABERDEEN, SCOTLAND**

Page 6 of 6

File RFLA 81028A

Company A/S Norske Shell Expl. & Prod. Formation \_\_\_\_\_

Well 31/2-5 County North Sea

Field \_\_\_\_\_ State Norway

HYDROCARBON ANALYSIS OF STOCK TANK OIL SAMPLE

| COMPONENT        | MOL<br>PERCENT | WEIGHT<br>PERCENT | DENSITY | API  | MOL<br>WEIGHT |
|------------------|----------------|-------------------|---------|------|---------------|
| Hydrogen Sulfide | NIL            | NIL               |         |      |               |
| Carbon Dioxide   | 0.05           | 0.01              |         |      |               |
| Nitrogen         | 0.01           | Trace             |         |      |               |
| Methane          | 0.06           | Trace             |         |      |               |
| Ethane           | 0.25           | 0.03              |         |      |               |
| Propane          | 0.61           | 0.11              |         |      |               |
| iso-Butane       | 0.67           | 0.17              |         |      |               |
| n-Butane         | 0.65           | 0.16              |         |      |               |
| iso-Pentane      | 0.70           | 0.21              |         |      |               |
| n-Pentane        | 0.29           | 0.09              |         |      |               |
| Hexanes          | 1.64           | 0.60              |         |      |               |
| Heptanes plus    | 95.07          | 98.62             | 0.8883  | 27.6 | 244           |
|                  | <u>100.00</u>  | <u>100.00</u>     |         |      |               |

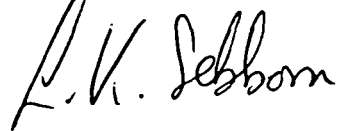
These analyses, opinions or interpretations are based on observations and material supplied by the client to whom, and for whose exclusive and confidential use, this report is made. The interpretations or opinions expressed represent the best judgement of Core Laboratories, Inc. (all errors and omissions excepted); but Core Laboratories, Inc. and its officers and employees, assume no responsibility and make no warranty or representations as to the productivity, proper operation, or profitableness of any oil, gas or other mineral well or sand in connection with which such report is used or relied upon.

**CORE LABORATORIES UK LTD.**  
*Petroleum Reservoir Engineering*  
**ABERDEEN, SCOTLAND**

A/S NORSKE SHELL EXPLORATION & PRODUCTION  
Well: 31/2-5

RFLA: 81028A

Core Laboratories UK Limited  
Reservoir Fluid Analysis

A handwritten signature in black ink, appearing to read "L. K. Sebborn". The signature is written in a cursive style with a large initial "L" and "K".

Les K. Sebborn  
Laboratory Manager-RFL