ORIGINAL

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Deres ref.	Deres brev av	Vår ref.	Dato
		Petroleum-div. Lydersen/WWi	November 12,1975

ANALYSIS OF SAMPLES FROM WELL 30/7-2

1. Samples from drill-stem test.
Two bottles will be transmitted: Redwood 5010 and A 1309. Data on the bottles are found in appendix 3 and 4. The analysis desired is outlined in appendix 1. Please note that condensate might be present in bottle A 1309.

Also note that no GOR is available. The recombination of oil and gas should therefore be done by saturating the oil with the gas at the reservoir conditions of 2582 psig and 128°F.

2. Samples from FIT.

Two bottles will be transmitted: Redwood 003 and A 1306. Data sheets in appendix 5 and 6.

Desired analysis is outlined in appendix 2.

Note that A 1306 probably contains some oil and/or condensate and should be treated accordingly.

./. 2

Suggested data sheets are included as appendix 7. We would prefer if these were used.

We would like to receive some data before the total analysis is completed. This will be discussed directly with the people at NTNFK and SINTEF.

Yours faithfully
for Norsk Hydro a.s

Th. van Golf-Racht

Appendix 1

Analysis on DST- samples.

The standard analysis as described for FIT- samples should be performed on both oil and gas samples. Before an attempt to recombine the oil and gas is made, a determination of the bubble point pressure of the oil at 128°F as well as compressibility measurements and a chromatographic analysis on the gas should be made.

Please note that the gas sample might contain some condensate, and should be handled accordingly.

The recombination should be carried out by assuming that the oil was saturated by the gas at reservoir conditions (128°F , 2582 psig).

After recombination, a standard "SINTEF reservoir fluid study" as decribed in SINTBF's letter of July 24, 1975 is to be performed.

A P P E N D I X 2

Analysis on FIT-samples.

1. FIT no. 5 (gas)

   Note that oil/condensate most probably is present. A Sample of the oil/condensate should be analysed as described in point 2 below, but excluding the Hempel distillation. Condensate volume relative to total volume should be measured.
   Specific gravity, mole weight are required for the gas. Also, compressibility as a function of pressure at reservoir temperature should be determined, as well as a chromatographic analysis of the gas.
   Reservoir conditions: FIT no. 5: 128°F, 2758 psig.

2. FIT no. 4 (oil)

   Required data:

   - Density at 15°C and 20°C, API gravity.
   - Viscosity at 4 temperatures, ranging from reservoir temperature to 15°C, measurement to be done at reservoir pressure.
   - Flash point
   - Pour point
   - Total sulfur
   - H_2S
   - Mercaptans
   - Water content by distillation
   - Salt content
   - Wax content
   - ASTM D = 285 Distillation

- Hempel distillation. In addition to standard data, average mole weights are desired for each fraction. The "gasoline" fraction (combined cuts up to 100°C) should be analysed as follows:
  - Yield, % of crude
  - Sp.gr. at 20°
  - Chromatographic analysis C_1 - C_9, giving all isomers possible to determine.

  The "diesels" fraction (100 - 175°C) should be analysed as follows:

  - Yield
  - Sp.gr. at 20°C
  - P.O.N.A. analysis (Paraffins, Naphtenes, Aromatics)

  The residue should be analysed for

  - Yield
  - Sp.gr. at 20°C
  - wt% sulfur
  - Cloud and pour points (if possible)

Reservoir conditions: FIT no. 4: 128°F, 2614 psig.

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Reservoir Sampling Report — Surface Sample

COMPANY NORSK-HYDRO

LEASE 30/7

LOCATION OFFSHORE NORWAY

FORMATION

WELL No. 30/7-2A

INTERVAL SAMPLED 1765.5 - 1776 metres

TYPE SAMPLE OIL

JOB No.

DATE 2-11-75

MEASUREMENT AND SAMPLING CONDITIONS

Production Test Operators OTIS

Flowing Well

Choke ..... for ..... hours

BH Pressure ..... at ..... Ft.

BH Temperature ..... at ..... Ft.

Well Head Pressure .....

Well Head Temperature .....

BSW .....%

Separator

Pressure ..... Temperature .....

Gas ..... SCF/Day

Oil ..... BOPD

GOR ..... SCF/BBL
(Separator conditions)

GOR ..... SCF/BBL
(Stock Tank conditions)

Sample Details:

Sample No. 1 Date 2/11/75 Time 10.35 - 10.55

Method Displacement Duration of Sampling 20 minutes

Bottle Pressure 50 psig. Temperature 50°F Volume 500cc (Nominal) Serial No. REDWOOD 5010

REMARKS:— Sample taken from separator @ static pressure of 50 psig after flow shut off. No G.O.R obtained thus sample is only of value for a compositional analysis of the oil contained in the bottle and not for Recombination for P.V.T. testing.

Sampled by Les Jebbon

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Reservoir Sampling Report — Surface Sample

COMPANY NORSK HYDRO

LEASE 30/7

LOCATION OFFSHORE NORWAY

FORMATION

WELL No. 30/7-2A

INTERVAL SAMPLED 1765.5 - 1776 metres

TYPE SAMPLE GAS

JOB No.

DATE 2/11/75

MEASUREMENT AND SAMPLING CONDITIONS

Production Test Operators OTIS

Flowing Well

Choke ..... for ..... hours

BH Pressure ..... at ..... Ft.

BH Temperature ..... at ..... Ft.

Well Head Pressure .....

Well Head Temperature .....

BSW .....%

Separator

Pressure ..... Temperature .....

Gas ..... SCF/Day

Oil ..... BOPD

GOR ..... SCF/BBL
(Separator conditions)

GOR ..... SCF/BBL
(Stock Tank conditions)

Sample Details :

Sample No. 1 Date 2/11/75 Time 10.45 - 11.00

Method Filling evacuated Bottle. Duration of Sampling 15 minutes

Bottle Pressure 50 psig Temperature 50°F Volume 20 Litres Serial No. A1309

REMARKS :— As per oil sample 1 (Bottle Redwood 5010)
ONLY FOR COMPOSITIONAL ANALYSIS.

Sampled by Les Sebborn.

Field Bubble Point—Subsurface Sample

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COMPANY NORSK HYDRO LEASE 30/7

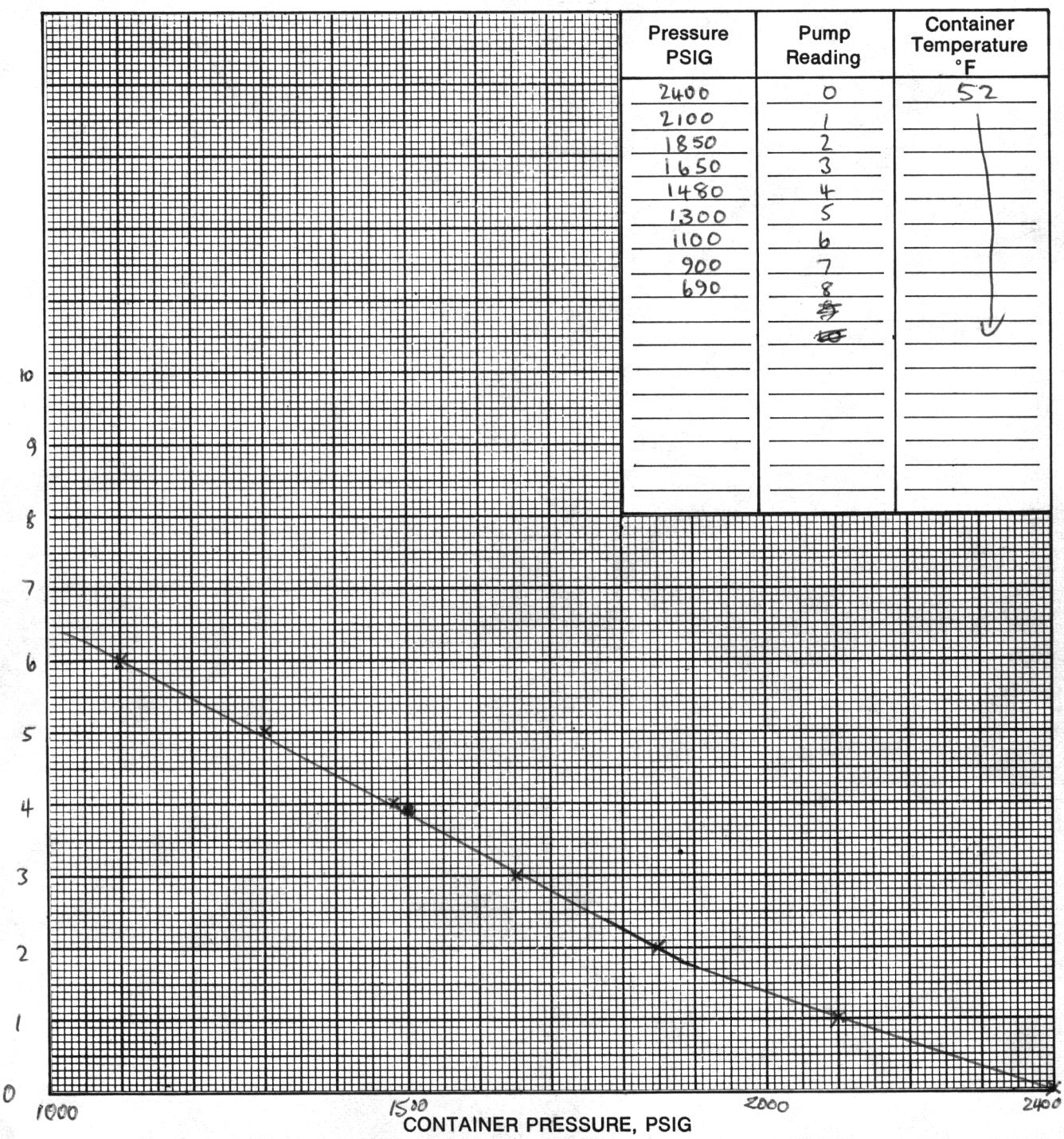
LOCATION NORTHERN NORTH SEA (NORWAY) FORMATION

WELL No. 30/7-2A INTERVAL SAMPLED 1808.5 metres

TYPE SAMPLE F.I.T. SAMPLE No. 4

DATE 23.10.75 SAMPLING TIME 1202-1228

Pressure PSIG	Pump Reading	Container Temperature °F
2400	0	52
2100	1	
1850	2	
1650	3	
1480	4	
1300	5	
1100	6	
900	7	
690	8	
	~~9~~	
	~~10~~	



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Reservoir Sampling Report—Subsurface Sample

COMPANY NORSK HYDRO

LEASE 30/7

LOCATION OFFSHORE NORWAY

FORMATION

WELL No. 30/7-2

INTERVAL SAMPLED 1808-5 metres

TYPE SAMPLE F.I.T

SAMPLE No. 4

DATE 23-10-75

TIME 1202-1228

SAMPLING AND TRANSFER CONDITIONS

* Bottom Hole Pressure	2620 p.s.i.g.	Bottle No.	REDWOOD 003
* Bottom Hole Temperature	°F.	Volume of Bottle	709 c.c.
Surface Pressure of Sample	200 p.s.i.g.	Volume of Hg. at end of transfer	560 c.c.
Surface Temperature of Sample	48 °F.	Volume of Hg. remaining in bottle	159 c.c.
Transfer Pressure	2600 p.s.i.g.	Volume of Hg. withdrawn	100 c.c.
Transfer Temperature	48 °F.	Field Bubble Point	2050 p.s.i.g.
Transfer Method	By pressure	Bubble Point Temperature	52 °F

* of sample.

Final pressure in Bottle 1650 psig

REMARKS :—

Sample pressure shut in on tool @ 12.28 hrs was in fact 2620 psi however on opening sample chamber on tool @ surface a pressure of only 200 psig was recorded - (possible leak from tool) Sample therefore pressured up to 2600 psig and transferred over. Some of sample flashed to atmosphere - black oil with some sand towards the bottom of the sample chamber, causing blockage of the valve. [One Amerada was also chocked with sand on removal from the tool.]

Remainder of sample in tool pushed out to atmosphere - mainly sand with a small amount of oil.

Sampled by Les Sebborn

Reported by Les Sebborn

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Reservoir Sampling Report—Subsurface Sample

COMPANY NORSK - HYDRO

LEASE 30/7

LOCATION OFFSHORE NORWAY

FORMATION

WELL No. 30/7-2A

INTERVAL SAMPLED 1753 metres

TYPE SAMPLE FIT

SAMPLE No. 5

DATE 2/11/75

TIME 2151–2207

SAMPLING AND TRANSFER CONDITIONS

Bottom Hole Pressure 2675 p.s.i.g.

Bottom Hole Temperature °F.

Surface Pressure of Sample 2200 p.s.i.g.

Surface Temperature of Sample 44 °F.

Transfer Pressure p.s.i.g.

Transfer Temperature 44 °F.

Transfer Method Direct Displacement into evacuated container

Bottle No. A1306

Volume of Bottle 20,000 c.c.

~~Volume of Hg. at end of transfer~~ c.c.

~~Volume of Hg. remaining in bottle~~ c.c.

~~Volume of Hg. withdrawn~~ c.c.

Field Bubble Point p.s.i.g.

Bubble Point Temperature °F

REMARKS :—

Sample Taken in 20 litre vessel as mainly gas, thus providing a more suitable sample for testing. Sample contained a reasonable amount of sand and blew out side of valve, causing pressure drop between sample vessel and F.I.T sample chamber. Thus final pressure in bottle 1245 psig, due to this mishap plus plugging up of valve on F.I.T. Tool.

Sampled by Les Lebbon

Reported by Les Lebbon

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Reservoir Sampling Report—Subsurface Sample

COMPANY NORSK HYDRO

LEASE 30-7

LOCATION OFFSHORE NORWAY

FORMATION

WELL No. 30/7-2A

INTERVAL SAMPLED 2010 metres

TYPE SAMPLE F.I.T.

SAMPLE No. 2

DATE 19-10-75

SAMPLING TIME 0743-0753

SAMPLING AND TRANSFER CONDITIONS

* Bottom Hole Pressure — p.s.i.g.

* Bottom Hole Temperature — °F.

Surface Pressure of Sample 50 p.s.i.g.

Surface Temperature of Sample 50 °F.

Transfer Pressure 100 p.s.i.g.

Transfer Temperature 50 °F.

Transfer Method Pressure

Bottle No. REDWOOD 014

Volume of Bottle 650 c.c.

Volume of Hg. at end of transfer 600 c.c.

Volume of Hg. remaining in bottle 50 c.c.

Volume of Hg. withdrawn — c.c.

Field Bubble Point — p.s.i.g.

Bubble Point Temperature — °F

* of sample

REMARKS :— Sample basically appeared to be water/drilling mud and explosion gases from firing of values. No value as a P.V.T sample as no work can be done on it except probably gas analysis to check on gas for possible hydrocarbon content.

No flow recorded on Amerada.

Sampled by Les Sebborn

Reported by Les Sebborn

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Reservoir Sampling Report—Subsurface Sample

COMPANY NORSK-HYDRO LEASE 30/7

LOCATION OFFSHORE NORWAY FORMATION

WELL No. 30/7-2A INTERVAL SAMPLED 1978 metres

TYPE SAMPLE F.I.T. SAMPLE No. 3

DATE 19-10-75 SAMPLING TIME 14.38-1503

SAMPLING AND TRANSFER CONDITIONS

* Bottom Hole Pressure	Open at 1585 Close at 2858 p.s.i.g.	Bottle No.	Redwood 015.
* Bottom Hole Temperature	..... °F.	Volume of Bottle	658 c.c.
Surface Pressure of Sample	200 p.s.i.g.	Volume of Hg. at end of transfer	508 c.c.
Surface Temperature of Sample	50 °F.	Volume of Hg. remaining in bottle	150 c.c.
Transfer Pressure	2000 p.s.i.g.	Volume of Hg. withdrawn	NIL c.c.
Transfer Temperature	50 °F.	Field Bubble Point	— p.s.i.g.
Transfer Method	Pressure	Bubble Point Temperature	— °F

* of sample.

REMARKS :—

Sample pressure in chamber 200 psig - pressured cell up to 2000 psig for sample transfer. Remains of sample flushed to atmosphere - mainly water and mud with slight trace of hydrocarbons present as a film on surface of water. Sample in bomb probably only water - not suitable for P.V.T. analysis although possible to do water compressibility study on this sample.

Hydrostatic pressure 3817 psig

Sampled by Les Lebborn

Reported by Les Lebborn