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Petroleum geochemistry of well 30/9-16 and hydrocarbon correlation with wells in the J and C areas of Oseberg Syd.

Volume 1 of 2

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Abstract see inside.

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1 INTRODUCTION

Well 30/9-16 was spudded on 14 June 1994 and was plugged and abandoned on 8 August 1994. The well is an exploration well drilled on the K-West structure of the Oseberg Syd area (Figure 1.1). It reached a total depth of 3550 m¹ in the Statfjord Fm. A summary log is shown in Figure 1.2. Formation tops are listed in Table 1.1.

The interval down to 2668 m was drilled using the Anco 2000 mud system, while a KCl polymer mud was used from there to TD.

Four cores were taken with recovery from the following depth intervals²: 2694 - 2722.35 m (Core #1, intra Heather Fm. and upper Tarbert Fm.), 2722.5 - 2759.7 m (Core # 2, upper Tarbert Fm.), 2759.7 - 2796.4 m (Core # 3, upper and middle Tarbert), 3459 - 3486.25 m (Core # 4, Statfjord Fm.). Drill stem tests were carried out in the oil zone at 2722 - 2753 m (DST # 1, Tarbert Fm., oil and gas samples) and in the gas zone at 2685.10 - 2694.10 m (DST # 2, intra Heather Fm., gas and condensate samples).

Parts of the Tarbert and Heather Fm. sandstones were oil-saturated. The oil-water contact (OWC) is located at 2764 m in the Heather Fm. sandstone and the gas-oil contact (GOC) at 2706 m depth in the Tarbert Fm. Oil shows were also recorded in the Statfjord Fm.

The objectives of this standard geochemical study include the characterisation of migrated hydrocarbons found in the Heather, Tarbert and Statfjord Fm. sandstones and the correlation of these hydrocarbons with those found in the wells of the J area (30/9-5, 30/9-9, 30/9-11A, 30/9-15) and the C structure (30/9-6). In addition, some coals from the Tarbert and Ness Fms. and some shales from the Drake Fm. were characterised with respect to their liquid hydrocarbon potential.

A list of all analysed samples is presented in Table 1.2. The analytical and preparative methods employed in this study comprise Rock-Eval pyrolysis, solvent extraction followed by asphaltene precipitation and preparative group type

¹
²

All depths used in this report are in metres measured depth below RKB (m MD RKB).
Depths refer to recovered core.

separation by MPLC³, analytical group type separation by TLC-FID⁴ (Iatroscan), gas chromatography (GC-FID) of saturated and aromatic hydrocarbons, analysis of biomarkers in the saturated and aromatic fractions by gas chromatography-mass spectrometry (GC-MSD⁵, oils from tests also GC-MRM⁶). Analysis of stable carbon isotopes and gas chromatographic analysis of C₄-C₂₀ hydrocarbons were performed on selected extract and oil/condensate samples. Pyrolysis-gas chromatography was carried out on selected coal and shale samples in order to characterise the organic matter composition of these rocks.

This report presents the results of this study. The first volume contains a descriptive and interpretive text, with figures and some basic tables in a separate section. Gas chromatograms, mass chromatograms and standardised graphic and tabular presentations of these data are found in a separate Appendix volume.

The volumetric and stable isotope composition of the gas samples was determined out by the Institute for Energy Research (IFE), Kjeller, Norway. Stable carbon isotope analysis of the oil and extract fractions and pyrolysis-gas chromatography of solvent-extracted rock samples were performed by Geolab Nor in Trondheim, Norway. All other analytical work and reporting was carried out at Norsk Hydro Research Centre in Bergen, Norway.

3 Medium Pressure/Performance Liquid Chromatography
4 Thin Layer Chromatography with Flame Ionisation Detection
5 Mass-Sensitive Detector
6 Metastable Reaction Monitoring

Table 1.2 List of analysed samples

| Well Name | Top Depth | End Depth | Group / Formation | Type | Lithology | Name | Rock-Eval | Rock-Eval (extr. rock) | Py-GC | Extr / Deasph | MPLC | Intros-can | GC SAT (FID) | GC-MS SAT (MSD) | GC-MS SAT (MRM1) | GC-MS ARO (MSD) | GC C5-C20 (FID) | C Isotopes (fractions) | C, H isotopes (gas) |
|-----------|-----------|-----------|-------------------|------|-----------|----------|-----------|------------------------|-------|---------------|------|------------|--------------|-----------------|------------------|-----------------|-----------------|------------------------|---------------------|
| 30/9-16 | 2655.00 | 2660.00 | HEATHER | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2665.00 | 2667.00 | HEATHER | DC | CLYST | | 1 | | | | | | | | | | | | |
| 30/9-16 | 2667.00 | 2670.00 | HEATHER | DC | CLYST | | 1 | | | | | | | | | | | | |
| 30/9-16 | 2670.00 | 2672.00 | HEATHER | DC | SH/COAL | | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | | |
| 30/9-16 | 2677.00 | 2680.00 | HEATHER | DC | SLST/SST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2692.50 | 2692.50 | HEATHER SST | SWC | SST | 52 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | | |
| 30/9-16 | 2685.10 | 2694.10 | HEATHER SST | OIL | | DST # 2 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 30/9-16 | 2685.10 | 2694.10 | HEATHER SST | GAS | | DST # 2 | | | | | | | | | | | | | 1 |
| 30/9-16 | 2702.00 | 2702.00 | HEATHER SST | COPL | SST | 32 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2703.00 | 2703.00 | HEATHER SST | COPL | SST | 36 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2704.05 | 2704.05 | HEATHER SST | COPL | SST | 40 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2705.00 | 2705.00 | HEATHER SST | COPL | SST | 44 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2706.00 | 2706.00 | HEATHER SST | COPL | SST | 48 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2707.00 | 2707.00 | HEATHER SST | COPL | SST | 52 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2708.00 | 2708.00 | HEATHER SST | COPL | SST | 56 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2709.00 | 2709.00 | HEATHER SST | COPL | SST | 60 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2711.00 | 2711.00 | HEATHER SST | COPL | SST | 67 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2712.00 | 2712.00 | HEATHER SST | COPL | SST | 71 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2713.00 | 2713.00 | HEATHER SST | COPL | SST | 75 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2718.00 | 2718.00 | TARBERT | COCH | COAL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2720.90 | 2720.90 | TARBERT | COCH | COAL | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2721.00 | 2721.00 | TARBERT | COPL | SST | 4 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2722.20 | 2722.20 | TARBERT | COCH | SST | 1 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | | |
| 30/9-16 | 2723.50 | 2723.50 | TARBERT | COPL | SST | 6 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2724.00 | 2724.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2727.00 | 2727.00 | TARBERT | OIL | | RFS(RFT) | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 30/9-16 | 2727.00 | 2727.00 | TARBERT | COCH | SST | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2729.00 | 2729.00 | TARBERT | COCH | SST | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | | |
| 30/9-16 | 2731.00 | 2731.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2736.00 | 2736.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2740.00 | 2740.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2740.46 | 2740.46 | TARBERT | COCH | SST | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2742.00 | 2742.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2744.00 | 2744.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2744.60 | 2744.60 | TARBERT | COCH | SST/PYR | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | | |
| 30/9-16 | 2744.62 | 2744.62 | TARBERT | COCH | SST | CORE # 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2746.00 | 2746.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2749.50 | 2749.50 | TARBERT | COCH | SST | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2749.55 | 2749.55 | TARBERT | COCH | SST | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | | |

Table 1.2 List of analysed samples (cont'd)

| Well Name | Top Depth | End Depth | Group / Formation | Type | Lithology | Name | Rock-Eval | Rock-Eval (extr. rock) | Py-GC | Extr / Deasph | MPLC | Isotroscan | GC SAT (FID) | GC-MS SAT (MSD) | GC-MS SAT (MRM1) | GC-MS ARO (MSD) | GC C5-C20 (FID) | C isotopes (fractions) | C, H isotopes (gas) |
|-----------|-----------|-----------|-------------------|------|------------|---------|-----------|------------------------|-------|---------------|------|------------|--------------|-----------------|------------------|-----------------|-----------------|------------------------|---------------------|
| 30/9-16 | 2750.00 | 2750.00 | TARBERT | COCH | SST | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | | |
| 30/9-16 | 2753.00 | 2753.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2722.00 | 2753.00 | TARBERT | OIL | | DST # 1 | | | | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | |
| 30/9-16 | 2722.00 | 2753.00 | TARBERT | GAS | | DST # 1 | | | | | | | | | | | | | 1 |
| 30/9-16 | 2757.00 | 2757.00 | TARBERT | COCH | SST | 2 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2759.00 | 2759.00 | TARBERT | COCH | SST | 2 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2760.00 | 2760.00 | TARBERT | COCH | SST | 3 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2764.00 | 2764.00 | TARBERT | COCH | SST | 3 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2767.50 | 2767.50 | TARBERT | COCH | SST | | 1 | | | | | | | | | | | | |
| 30/9-16 | 2769.00 | 2769.00 | TARBERT | COCH | SST | 3 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2769.25 | 2769.25 | TARBERT | COCH | SST | 3 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2771.00 | 2771.00 | TARBERT | COCH | SST | 3 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2780.00 | 2780.00 | TARBERT | COCH | SST | 3 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2783.00 | 2783.00 | TARBERT | COCH | COAL | 3 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 2790.00 | 2790.00 | TARBERT | COCH | SST | 3 | 1 | | | | | | | | | | | | |
| 30/9-16 | 2818.00 | 2818.00 | TARBERT | SWC | SST/COAL | 48 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | | |
| 30/9-16 | 2820.00 | 2822.00 | NESS | DC | COAL/SST | K 1-8 | 1 | 1 | 1 | 1 | | | | | | | | | |
| 30/9-16 | 3017.00 | 3020.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3037.00 | 3040.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3055.00 | 3060.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3075.00 | 3080.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3095.00 | 3100.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3110.00 | 3120.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3130.00 | 3140.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3150.00 | 3160.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 3170.00 | 3180.00 | DRAKE | DC | CLYST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3190.00 | 3200.00 | DRAKE | DC | CLYST/SLST | K 1-8 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 3210.00 | 3220.00 | DRAKE | DC | CLYST/SLST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3230.00 | 3240.00 | DRAKE | DC | CLYST/SLST | K 1-8 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3462.00 | 3462.00 | STATFJORD | COCH | SST | 4 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3465.00 | 3465.00 | STATFJORD | COCH | SST | 4 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 3465.40 | 3465.40 | STATFJORD | COCH | SST/COAL | 4 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 3467.00 | 3467.00 | STATFJORD | COCH | SST | 4 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3467.70 | 3467.70 | STATFJORD | COPL | SST | 416 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3468.00 | 3468.00 | STATFJORD | COCH | SST | 4 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3468.75 | 3468.75 | STATFJORD | COPL | SST | 420 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 3471.00 | 3471.00 | STATFJORD | COCH | SST | 4 | 1 | | | | | | | | | | | | |
| 30/9-16 | 3472.50 | 3472.50 | STATFJORD | COPL | SST | 435 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 3473.46 | 3473.46 | STATFJORD | COCH | SST | 4 | 1 | | | 1 | 1 | 1 | 1 | 1 | | 1 | | 1 | |
| 30/9-16 | 3477.75 | 3477.75 | STATFJORD | COPL | SST | 456 | 1 | | | | | | | | | | | | |

TABLE: 2.1.1

Petroleum Geochemistry Group
Research Centre Bergen



HYDRO

ROCK EVAL SCREENING DATA, WELL NOR:30/9-16

| Depth (m) | Group/Fm. | Lithology | Type | Tmax DegC | S1 kg/t | S2 kg/t | TOC % | HI | PI | Analysing Company |
|-----------|-------------|-----------|------|-----------|---------|---------|-------|-----|------|-------------------|
| 2660.00 | HEATHER | CLYST | DC | 433 | 1.9 | 6.5 | 3.1 | 208 | 0.22 | NORSK HYDRO |
| 2667.00 | HEATHER | CLYST | DC | 438 | 0.4 | 2.1 | 1.0 | 217 | 0.16 | NORSK HYDRO |
| 2670.00 | HEATHER | CLYST | DC | 434 | 0.4 | 2.6 | 1.5 | 174 | 0.14 | NORSK HYDRO |
| 2672.00 | HEATHER | SH/COAL | DC | 435 | 0.7 | 6.2 | 4.2 | 148 | 0.10 | NORSK HYDRO |
| 2680.00 | HEATHER | SLST | DC | 434 | 0.5 | 4.8 | 2.0 | 239 | 0.09 | NORSK HYDRO |
| 2692.50 | HEATHER SST | SST | SWC | 439 | 1.5 | 0.4 | 0.4 | 88 | 0.81 | NORSK HYDRO |
| 2702.00 | HEATHER SST | SST | COPL | 424 | 0.2 | 0.3 | 0.3 | 87 | 0.46 | NORSK HYDRO |
| 2703.00 | HEATHER SST | SST | COPL | 422 | 0.4 | 0.3 | 0.3 | 110 | 0.55 | NORSK HYDRO |
| 2704.05 | HEATHER SST | SST | COPL | 431 | 0.3 | 0.3 | 0.4 | 78 | 0.45 | NORSK HYDRO |
| 2705.00 | HEATHER SST | SST | COPL | 432 | 0.3 | 0.3 | 0.5 | 66 | 0.50 | NORSK HYDRO |
| 2706.00 | HEATHER SST | SST | COPL | 410 | 7.1 | 1.0 | 1.0 | 100 | 0.88 | NORSK HYDRO |
| 2707.00 | HEATHER SST | SST | COPL | 412 | 8.7 | 1.3 | 1.1 | 124 | 0.87 | NORSK HYDRO |
| 2708.00 | HEATHER SST | SST | COPL | 419 | 12.9 | 2.2 | 1.9 | 117 | 0.85 | NORSK HYDRO |
| 2709.00 | HEATHER SST | SST | COPL | 414 | 9.5 | 1.3 | 1.0 | 125 | 0.88 | NORSK HYDRO |
| 2711.00 | HEATHER SST | SST | COPL | 412 | 5.4 | 0.8 | 0.7 | 124 | 0.87 | NORSK HYDRO |
| 2712.00 | HEATHER SST | SST | COPL | 417 | 2.8 | 1.0 | 0.8 | 123 | 0.73 | NORSK HYDRO |
| 2713.00 | HEATHER SST | SST | COPL | 429 | 2.3 | 1.3 | 1.2 | 104 | 0.65 | NORSK HYDRO |
| 2718.00 | TARBERT | COAL | COCH | 429 | 45.4 | 238.4 | 70.7 | 337 | 0.16 | NORSK HYDRO |
| 2720.90 | TARBERT | COAL | COCH | 429 | 38.9 | 227.9 | 71.2 | 320 | 0.15 | NORSK HYDRO |
| 2721.00 | TARBERT | SST | COPL | 421 | 15.9 | 4.3 | 2.9 | 147 | 0.79 | NORSK HYDRO |
| 2722.20 | TARBERT | SST | COCH | 422 | 13.0 | 2.0 | 1.6 | 120 | 0.87 | NORSK HYDRO |
| 2723.50 | TARBERT | SST | COPL | 410 | 13.0 | 1.3 | 1.4 | 96 | 0.91 | NORSK HYDRO |
| 2724.00 | TARBERT | SST | COCH | 407 | 13.1 | 1.3 | 1.4 | 91 | 0.91 | NORSK HYDRO |
| 2727.00 | TARBERT | SST | COCH | 412 | 16.2 | 1.6 | 1.6 | 101 | 0.91 | NORSK HYDRO |
| 2729.00 | TARBERT | SST | COCH | 416 | 7.1 | 1.2 | 1.0 | 112 | 0.86 | NORSK HYDRO |
| 2731.00 | TARBERT | SST | COCH | 410 | 11.2 | 1.2 | 1.2 | 96 | 0.91 | NORSK HYDRO |
| 2736.00 | TARBERT | SST | COCH | 415 | 12.1 | 1.4 | 1.3 | 107 | 0.90 | NORSK HYDRO |
| 2740.00 | TARBERT | SST | COCH | 420 | 7.5 | 1.2 | 0.9 | 122 | 0.87 | NORSK HYDRO |
| 2740.46 | TARBERT | SST | COCH | 420 | 16.1 | 1.9 | 1.8 | 106 | 0.90 | NORSK HYDRO |
| 2742.00 | TARBERT | SST | COCH | 425 | 15.4 | 2.3 | 1.8 | 132 | 0.87 | NORSK HYDRO |
| 2744.00 | TARBERT | SST | COCH | 416 | 10.6 | 2.1 | 1.5 | 139 | 0.84 | NORSK HYDRO |
| 2744.60 | TARBERT | SST/PYR | COCH | 415 | 15.0 | 2.5 | 3.0 | 84 | 0.86 | NORSK HYDRO |
| 2744.62 | TARBERT | SST | COCH | 410 | 13.2 | 1.8 | 1.8 | 100 | 0.88 | NORSK HYDRO |



TABLE: 2.1.1

ROCK EVAL SCREENING DATA, WELL NOR:30/9-16 (cont'd)

| Depth (m) | Group/Fm. | Lithology | Type | Tmax DegC | S1 kg/t | S2 kg/t | TOC % | HI | PI | Analysing Company |
|-----------|-----------|------------|------|-----------|---------|---------|-------|-----|------|-------------------|
| 2746.00 | TARBERT | SST | COCH | 413 | 11.4 | 1.1 | 1.2 | 90 | 0.91 | NORSK HYDRO |
| 2749.50 | TARBERT | SST | COCH | 416 | 13.1 | 1.6 | 1.4 | 111 | 0.89 | NORSK HYDRO |
| 2749.55 | TARBERT | SST | COCH | 429 | 9.1 | 3.7 | 3.0 | 126 | 0.71 | NORSK HYDRO |
| 2750.00 | TARBERT | SST | COCH | 416 | 5.0 | 0.9 | 0.8 | 110 | 0.85 | NORSK HYDRO |
| 2753.00 | TARBERT | SST | COCH | 423 | 9.8 | 1.2 | 1.0 | 116 | 0.89 | NORSK HYDRO |
| 2757.00 | TARBERT | SST | COCH | 423 | 12.7 | 1.9 | 1.4 | 133 | 0.87 | NORSK HYDRO |
| 2759.00 | TARBERT | SST | COCH | 419 | 12.9 | 1.8 | 1.4 | 128 | 0.88 | NORSK HYDRO |
| 2760.00 | TARBERT | SST | COCH | 419 | 6.6 | 0.6 | 0.7 | 88 | 0.91 | NORSK HYDRO |
| 2764.00 | TARBERT | SST | COCH | 420 | 1.5 | 0.2 | 0.3 | 77 | 0.87 | NORSK HYDRO |
| 2767.50 | TARBERT | SST | COCH | | | 0.2 | 0.1 | 155 | | NORSK HYDRO |
| 2769.00 | TARBERT | SST | COCH | | 0.1 | 0.0 | 0.1 | | | NORSK HYDRO |
| 2769.25 | TARBERT | SST | COCH | | 0.1 | 0.0 | 0.1 | 0 | | NORSK HYDRO |
| 2771.00 | TARBERT | SST | COCH | | 0.0 | 0.0 | 0.0 | 0 | | NORSK HYDRO |
| 2780.00 | TARBERT | SST | COCH | | 0.0 | 0.0 | 0.0 | 0 | | NORSK HYDRO |
| 2783.00 | TARBERT | COAL | COCH | 429 | 27.9 | 204.1 | 72.4 | 282 | 0.12 | NORSK HYDRO |
| 2790.00 | TARBERT | SST | COCH | 431 | 3.8 | 2.0 | 1.8 | 110 | 0.66 | NORSK HYDRO |
| 2818.00 | TARBERT | SST/COAL | SWC | 436 | 0.6 | 6.9 | 5.3 | 132 | 0.08 | NORSK HYDRO |
| 2822.00 | NESS | COAL/SST | DC | 435 | 8.2 | 117.0 | 65.7 | 178 | 0.07 | NORSK HYDRO |
| 3020.00 | DRAKE | CLYST | DC | 439 | 0.3 | 3.2 | 2.1 | 149 | 0.09 | NORSK HYDRO |
| 3040.00 | DRAKE | CLYST | DC | 439 | 0.5 | 4.0 | 2.8 | 141 | 0.10 | NORSK HYDRO |
| 3060.00 | DRAKE | CLYST | DC | 436 | 0.6 | 3.8 | 2.2 | 171 | 0.13 | NORSK HYDRO |
| 3080.00 | DRAKE | CLYST | DC | 440 | 0.3 | 2.7 | 1.6 | 169 | 0.10 | NORSK HYDRO |
| 3100.00 | DRAKE | CLYST | DC | 439 | 0.3 | 4.3 | 2.3 | 191 | 0.07 | NORSK HYDRO |
| 3120.00 | DRAKE | CLYST | DC | 442 | 0.4 | 5.7 | 1.8 | 324 | 0.07 | NORSK HYDRO |
| 3140.00 | DRAKE | CLYST | DC | 437 | 1.4 | 11.6 | 2.6 | 445 | 0.11 | NORSK HYDRO |
| 3160.00 | DRAKE | CLYST | DC | 438 | 1.5 | 12.7 | 2.6 | 484 | 0.11 | NORSK HYDRO |
| 3180.00 | DRAKE | CLYST | DC | 444 | 0.4 | 3.9 | 1.3 | 298 | 0.10 | NORSK HYDRO |
| 3200.00 | DRAKE | CLYST/SLST | DC | 441 | 0.6 | 5.0 | 1.4 | 356 | 0.11 | NORSK HYDRO |
| 3220.00 | DRAKE | CLYST/SLST | DC | 442 | 0.5 | 4.7 | 1.7 | 270 | 0.09 | NORSK HYDRO |
| 3240.00 | DRAKE | CLYST/SLST | DC | 444 | 0.3 | 3.1 | 1.4 | 227 | 0.08 | NORSK HYDRO |
| 3462.00 | STATFJORD | SST | COCH | | 0.6 | 0.1 | 0.1 | 93 | 0.82 | NORSK HYDRO |
| 3465.00 | STATFJORD | SST | COCH | | 0.8 | 0.1 | 0.1 | 70 | 0.92 | NORSK HYDRO |
| 3465.40 | STATFJORD | SST/COAL | COCH | 447 | 1.5 | 4.7 | 4.3 | 109 | 0.24 | NORSK HYDRO |

TABLE: 2.1.1

Petroleum Geochemistry Group
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HYDRO

ROCK EVAL SCREENING DATA, WELL NOR:30/9-16 (cont'd)

| Depth (m) | Group/Fm. | Lithology | Type | Tmax DegC | S1 kg/t | S2 kg/t | TOC % | HI | PI | Analysing Company |
|-----------|-----------|-----------|------|-----------|---------|---------|-------|-----|------|-------------------|
| 3467.00 | STATFJORD | SST | COCH | | 0.2 | 0.0 | 0.0 | 150 | | NORSK HYDRO |
| 3467.70 | STATFJORD | SST | COPL | | 0.0 | 0.0 | 0.0 | 0 | | NORSK HYDRO |
| 3468.00 | STATFJORD | SST | COCH | | 0.0 | 0.2 | | | 0.00 | NORSK HYDRO |
| 3468.75 | STATFJORD | SST | COPL | | 0.8 | 0.2 | 0.1 | 175 | 0.79 | NORSK HYDRO |
| 3471.00 | STATFJORD | SST | COCH | | 0.0 | 0.0 | 0.0 | 0 | | NORSK HYDRO |
| 3472.50 | STATFJORD | SST | COPL | | 3.7 | 0.3 | 0.4 | 68 | 0.94 | NORSK HYDRO |
| 3473.46 | STATFJORD | SST | COCH | 411 | 3.9 | 0.3 | 0.4 | 83 | 0.92 | NORSK HYDRO |
| 3477.75 | STATFJORD | SST | COPL | 457 | 0.1 | 0.2 | 0.4 | 40 | 0.29 | NORSK HYDRO |

TABLE: 2.1.2

Petroleum Geochemistry Group
Research Centre Bergen



HYDRO

ROCK EVAL SCREENING DATA ON EXTRACTED SEDIMENTS, WELL NOR:30/9-16

| Depth (m) | Group/Fm. | Lithology | Type | Tmax DegC | S1 kg/t | S2 kg/t | TOC % | HI | PI | Analysing Company |
|--------------|-----------|------------|------|--------------|------------|------------|----------|-----|------|-------------------|
| 2718.00 | TARBERT | COAL | COCH | 430 | 1.8 | 213.1 | 57.5 | 370 | 0.01 | NORSK HYDRO |
| 2720.90 | TARBERT | COAL | COCH | 427 | 3.4 | 231.3 | 68.5 | 338 | 0.01 | NORSK HYDRO |
| 2783.00 | TARBERT | COAL | COCH | 430 | 2.7 | 216.8 | 79.0 | 274 | 0.01 | NORSK HYDRO |
| 2822.00 | NESS | COAL/SST | DC | 437 | 3.4 | 106.3 | 63.5 | 168 | 0.03 | NORSK HYDRO |
| 3160.00 | DRAKE | CLYST | DC | 440 | 0.0 | 9.0 | 2.1 | 419 | 0.00 | NORSK HYDRO |
| 3200.00 | DRAKE | CLYST/SLST | DC | 443 | 0.1 | 2.5 | 1.1 | 230 | 0.02 | NORSK HYDRO |

TABLE: 2.2.1

Petroleum Geochemistry Group
Research Centre Bergen

HYDRO

EXTRACTION/DEASPHALTING DATA (SEDIMENTS), WELL NOR:30/9-16

| Depth (m) | Group/Fm. | Lithology | Type | Rock (g) | EOM (mg) | ASP (mg) | EOM (%) | ASP (%) | EOM (ppm) | TOC (%) | EOM/TOC (%) | Analysing Company |
|--------------|-------------|------------|------|-------------|-------------|-------------|------------|------------|--------------|------------|----------------|----------------------|
| 2672.00 | HEATHER | SH/COAL | DC | 15.5 | 35.1 | | 0.23 | 27.0 | 2300 | 4.2 | 0.1 | NORSK HYD |
| 2692.50 | HEATHER SST | SST | SWC | 14.4 | 26.2 | | 0.18 | 10.6 | 1800 | 0.4 | 0.4 | NORSK HYD |
| 2705.00 | HEATHER SST | SST | COPL | 15.5 | 11.5 | 2.5 | 0.07 | 21.7 | 700 | 0.5 | 0.1 | NORSK HYD |
| 2707.00 | HEATHER SST | SST | COPL | 3.3 | 42.3 | 1.1 | 1.30 | 2.6 | 13000 | 1.1 | 1.2 | NORSK HYD |
| 2712.00 | HEATHER SST | SST | COPL | 5.8 | 27.7 | 1.5 | 0.48 | 5.4 | 4800 | 0.8 | 0.6 | NORSK HYD |
| 2718.00 | TARBERT | COAL | COCH | 0.7 | 31.6 | | 4.45 | 19.5 | 44500 | 70.7 | 0.1 | NORSK HYD |
| 2720.90 | TARBERT | COAL | COCH | 0.7 | 24.5 | | 3.31 | 26.9 | 33100 | 71.2 | 0.0 | NORSK HYD |
| 2721.00 | TARBERT | SST | COPL | 1.6 | 35.0 | 3.0 | 2.15 | 8.6 | 21500 | 2.9 | 0.7 | NORSK HYD |
| 2722.20 | TARBERT | SST | COCH | 3.4 | 55.8 | | 1.63 | 5.3 | 16300 | 1.6 | 1.0 | NORSK HYD |
| 2727.00 | TARBERT | SST | COCH | 2.7 | 47.4 | | 1.78 | 2.2 | 17800 | 1.6 | 1.1 | NORSK HYD |
| 2729.00 | TARBERT | SST | COCH | 5.8 | 47.8 | | 0.82 | 6.2 | 8200 | 1.0 | 0.8 | NORSK HYD |
| 2740.46 | TARBERT | SST | COCH | 2.7 | 34.9 | | 1.29 | 4.9 | 12900 | 1.8 | 0.7 | NORSK HYD |
| 2744.60 | TARBERT | SST/PYR | COCH | | | | | | | 3.0 | | NORSK HYD |
| 2744.62 | TARBERT | SST | COCH | 3.3 | 56.6 | | 1.73 | 11.0 | 17300 | 1.8 | 1.0 | NORSK HYD |
| 2749.50 | TARBERT | SST | COCH | 4.1 | 61.2 | | 1.49 | 4.0 | 14900 | 1.4 | 1.1 | NORSK HYD |
| 2749.55 | TARBERT | SST | COCH | 4.3 | 64.3 | | 1.50 | 5.4 | 15000 | 3.0 | 0.5 | NORSK HYD |
| 2750.00 | TARBERT | SST | COCH | 8.2 | 51.1 | | 0.62 | 6.7 | 6200 | 0.8 | 0.8 | NORSK HYD |
| 2759.00 | TARBERT | SST | COCH | 3.2 | 49.2 | | 1.53 | 4.5 | 15300 | 1.4 | 1.1 | NORSK HYD |
| 2764.00 | TARBERT | SST | COCH | 21.0 | 89.0 | | 0.42 | 5.6 | 4200 | 0.3 | 1.4 | NORSK HYD |
| 2783.00 | TARBERT | COAL | COCH | 1.6 | 47.5 | | 2.88 | 40.0 | 28800 | 72.4 | 0.0 | NORSK HYD |
| 2818.00 | TARBERT | SST/COAL | SWC | 19.8 | 58.1 | | 0.29 | 34.7 | 2900 | 5.3 | 0.1 | NORSK HYD |
| 3160.00 | DRAKE | CLYST | DC | 16.4 | 73.1 | | 0.45 | 13.4 | 4500 | 2.6 | 0.2 | NORSK HYD |
| 3200.00 | DRAKE | CLYST/SLST | DC | 15.4 | 28.5 | | 0.19 | 19.9 | 1900 | 1.4 | 0.1 | NORSK HYD |
| 3465.00 | STATFJORD | SST | COCH | 27.3 | 46.2 | | 0.17 | 5.1 | 1700 | 0.1 | 1.7 | NORSK HYD |
| 3465.40 | STATFJORD | SST/COAL | COCH | 20.8 | 39.0 | | 0.19 | 19.9 | 1900 | 4.3 | 0.0 | NORSK HYD |
| 3468.75 | STATFJORD | SST | COPL | 30.4 | 57.3 | | 0.19 | 4.2 | 1900 | 0.1 | 1.6 | NORSK HYD |
| 3472.50 | STATFJORD | SST | COPL | 16.2 | 66.8 | | 0.41 | 2.0 | 4100 | 0.4 | 1.1 | NORSK HYD |
| 3473.46 | STATFJORD | SST | COCH | 16.9 | 69.9 | | 0.41 | 3.9 | 4100 | 0.4 | 1.0 | NORSK HYD |

TABLE: 2.2.2Petroleum Geochemistry Group
Research Centre Bergen

HYDRO

DEASPHALTING DATA (OILS), WELL NOR:30/9-16

| St.Depth (m) | En.Depth (m) | Group/Fm. | Name | OIL (mg) | ASP (mg) | ASP (%) | Analysing Company |
|-----------------|-----------------|-------------|----------|-------------|-------------|------------|-------------------|
| 2685.10 | 2694.10 | HEATHER SST | DST # 2 | 58.30 | 0.0 | | NORSK HYDRO |
| 2727.00 | 2727.00 | TARBERT | RFS 1057 | 472.40 | 0.4 | 0.1 | NORSK HYDRO |
| 2722.00 | 2753.00 | TARBERT | DST # 1 | 53.10 | 0.1 | 0.2 | NORSK HYDRO |

TABLE: 2.2.3

Petroleum Geochemistry Group
Research Centre Bergen

HYDRO

COMPOSITION OF DEASPHALTED EXTRACT (IATROSCAN), WELL NOR:30/9-16

(all values in %)

| Depth (m) | Group/Fm. | Lithology | Type | Hydrocarbons | | | | Non-HC TOTAL | TOTAL HC/Non-HC | Analysing Company |
|--------------|-------------|------------|------|--------------|------|-------|---------|-----------------|--------------------|----------------------|
| | | | | SAT | ARO | TOTAL | SAT/ARO | | | |
| 2672.00 | HEATHER | SH/COAL | DC | 6.5 | 25.0 | 31.5 | 0.3 | 68.5 | 0.5 | NORSK HYDRO |
| 2692.50 | HEATHER SST | SST | SWC | 60.0 | 24.0 | 84.0 | 2.5 | 16.0 | 5.3 | NORSK HYDRO |
| 2705.00 | HEATHER SST | SST | COPL | 42.0 | 25.0 | 67.0 | 1.7 | 33.0 | 2.0 | NORSK HYDRO |
| 2707.00 | HEATHER SST | SST | COPL | 58.0 | 29.0 | 87.0 | 2.0 | 13.0 | 6.7 | NORSK HYDRO |
| 2712.00 | HEATHER SST | SST | COPL | 59.0 | 26.0 | 85.0 | 2.3 | 15.0 | 5.7 | NORSK HYDRO |
| 2718.00 | TARBERT | COAL | COCH | 21.0 | 56.0 | 77.0 | 0.4 | 23.0 | 3.3 | NORSK HYDRO |
| 2720.90 | TARBERT | COAL | COCH | 6.0 | 66.0 | 72.0 | 0.1 | 28.0 | 2.6 | NORSK HYDRO |
| 2721.00 | TARBERT | SST | COPL | 61.0 | 24.0 | 85.0 | 2.5 | 15.0 | 5.7 | NORSK HYDRO |
| 2722.20 | TARBERT | SST | COCH | 55.0 | 35.0 | 90.0 | 1.6 | 10.0 | 9.0 | NORSK HYDRO |
| 2727.00 | TARBERT | SST | COCH | 55.0 | 36.0 | 91.0 | 1.5 | 9.0 | 10.1 | NORSK HYDRO |
| 2729.00 | TARBERT | SST | COCH | 56.0 | 35.0 | 91.0 | 1.6 | 9.0 | 10.1 | NORSK HYDRO |
| 2740.46 | TARBERT | SST | COCH | 54.0 | 36.0 | 90.0 | 1.5 | 10.0 | 9.0 | NORSK HYDRO |
| 2744.60 | TARBERT | SST/PYR | COCH | 52.0 | 44.0 | 96.0 | 1.2 | 4.0 | 24.0 | NORSK HYDRO |
| 2744.62 | TARBERT | SST | COCH | 62.0 | 30.0 | 92.0 | 2.1 | 8.0 | 11.5 | NORSK HYDRO |
| 2749.50 | TARBERT | SST | COCH | 53.0 | 37.0 | 90.0 | 1.4 | 10.0 | 9.0 | NORSK HYDRO |
| 2749.55 | TARBERT | SST | COCH | 56.0 | 36.0 | 92.0 | 1.6 | 8.0 | 11.5 | NORSK HYDRO |
| 2750.00 | TARBERT | SST | COCH | 58.0 | 32.0 | 90.0 | 1.8 | 10.0 | 9.0 | NORSK HYDRO |
| 2759.00 | TARBERT | SST | COCH | 57.0 | 33.0 | 90.0 | 1.7 | 10.0 | 9.0 | NORSK HYDRO |
| 2764.00 | TARBERT | SST | COCH | 64.0 | 27.0 | 91.0 | 2.4 | 9.0 | 10.1 | NORSK HYDRO |
| 2783.00 | TARBERT | COAL | COCH | 8.0 | 45.0 | 53.0 | 0.2 | 47.0 | 1.1 | NORSK HYDRO |
| 2818.00 | TARBERT | SST/COAL | SWC | 5.0 | 54.0 | 59.0 | 0.1 | 41.0 | 1.4 | NORSK HYDRO |
| 3160.00 | DRAKE | CLYST | DC | 15.0 | 47.0 | 62.0 | 0.3 | 38.0 | 1.6 | NORSK HYDRO |
| 3200.00 | DRAKE | CLYST/SLST | DC | 17.0 | 48.0 | 65.0 | 0.4 | 35.0 | 1.9 | NORSK HYDRO |
| 3465.00 | STATFJORD | SST | COCH | 63.0 | 32.0 | 95.0 | 2.0 | 5.0 | 19.0 | NORSK HYDRO |
| 3465.40 | STATFJORD | SST/COAL | COCH | 10.0 | 78.0 | 88.0 | 0.1 | 12.0 | 7.3 | NORSK HYDRO |
| 3468.75 | STATFJORD | SST | COPL | 62.0 | 33.0 | 95.0 | 1.9 | 5.0 | 19.0 | NORSK HYDRO |
| 3472.50 | STATFJORD | SST | COPL | 64.0 | 31.0 | 95.0 | 2.1 | 5.0 | 19.0 | NORSK HYDRO |
| 3473.46 | STATFJORD | SST | COCH | 60.0 | 35.0 | 95.0 | 1.7 | 5.0 | 19.0 | NORSK HYDRO |

TABLE: 2.2.4

Petroleum Geochemistry Group
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HYDRO

COMPOSITION OF DEASPHALTED OIL (IATROSCAN), WELL NOR:30/9-16

(all values in %)

| St.Depth (m) | En.Depth (m) | Group/Fm. | Name | Hydrocarbons | | | | Non-HC TOTAL | TOTAL HC/Non-HC | Analysing Company |
|-----------------|-----------------|-------------|----------|--------------|------|-------|---------|-----------------|--------------------|----------------------|
| | | | | SAT | ARO | TOTAL | SAT/ARO | | | |
| 2685.10 | 2694.10 | HEATHER SST | DST # 2 | 74.0 | 21.0 | 95.0 | 3.5 | 5.0 | 19.0 | NORSK HYDRO |
| 2727.00 | 2727.00 | TARBERT | RFS 1057 | 58.0 | 34.0 | 92.0 | 1.7 | 8.0 | 11.5 | NORSK HYDRO |
| 2722.00 | 2753.00 | TARBERT | DST # 1 | 58.0 | 34.0 | 92.0 | 1.7 | 8.0 | 11.5 | NORSK HYDRO |



TABLE: 2.3.1

SATURATED FRACTION MOLECULAR RATIOS (SEDIMENT SAMPLES), WELL NOR:30/9-16

| Depth (m) | Group/Fm. | Lithology | Type | Pristane/ nC17 | Pristane/ Phytane | CPI-I | CPI-II | nC17/ nC17+nC27 | Analysing Company |
|-----------|-------------|------------|------|-------------------|----------------------|-------|--------|--------------------|----------------------|
| 2672.00 | HEATHER | SH/COAL | DC | 2.1 | 3.3 | 1.4 | 1.1 | | NORSK HYDRO |
| 2692.50 | HEATHER SST | SST | SWC | 1.1 | 4.6 | 1.1 | 0.9 | | NORSK HYDRO |
| 2705.00 | HEATHER SST | SST | COPL | 1.1 | 3.0 | 1.0 | 0.9 | | NORSK HYDRO |
| 2707.00 | HEATHER SST | SST | COPL | 1.0 | 2.5 | 1.0 | 1.0 | | NORSK HYDRO |
| 2712.00 | HEATHER SST | SST | COPL | 1.0 | 2.5 | 1.0 | 0.9 | | NORSK HYDRO |
| 2718.00 | TARBERT | COAL | COCH | 0.8 | 2.8 | 1.0 | 0.8 | | NORSK HYDRO |
| 2720.90 | TARBERT | COAL | COCH | 0.7 | 0.3 | 1.1 | 0.9 | | NORSK HYDRO |
| 2721.00 | TARBERT | SST | COPL | 1.0 | 2.4 | 1.0 | 0.9 | | NORSK HYDRO |
| 2722.20 | TARBERT | SST | COCH | 1.0 | 2.4 | 1.0 | 0.9 | | NORSK HYDRO |
| 2727.00 | TARBERT | SST | COCH | 1.0 | 2.3 | 1.0 | 0.9 | | NORSK HYDRO |
| 2729.00 | TARBERT | SST | COCH | 1.0 | 2.3 | 1.0 | 0.9 | | NORSK HYDRO |
| 2740.46 | TARBERT | SST | COCH | 1.0 | 2.3 | 1.0 | 0.9 | | NORSK HYDRO |
| 2744.62 | TARBERT | SST | COCH | 1.0 | 2.3 | 1.0 | 0.9 | | NORSK HYDRO |
| 2749.50 | TARBERT | SST | COCH | 1.0 | 2.3 | 1.0 | 0.9 | | NORSK HYDRO |
| 2749.55 | TARBERT | SST | COCH | 1.0 | 2.4 | 1.0 | 0.9 | | NORSK HYDRO |
| 2750.00 | TARBERT | SST | COCH | 1.0 | 2.2 | 1.0 | 0.9 | | NORSK HYDRO |
| 2759.00 | TARBERT | SST | COCH | 1.0 | 2.3 | 1.0 | 0.9 | | NORSK HYDRO |
| 2764.00 | TARBERT | SST | COCH | 1.0 | 2.0 | 0.9 | 0.8 | | NORSK HYDRO |
| 2783.00 | TARBERT | COAL | COCH | 375.9 | 10.7 | 1.3 | 0.9 | | NORSK HYDRO |
| 2818.00 | TARBERT | SST/COAL | SWC | 19.6 | 9.5 | 1.3 | 1.0 | | NORSK HYDRO |
| 3160.00 | DRAKE | CLYST | DC | 1.0 | 1.6 | 1.2 | 1.0 | | NORSK HYDRO |
| 3200.00 | DRAKE | CLYST/SLST | DC | 0.9 | 2.3 | 1.2 | 1.1 | | NORSK HYDRO |
| 3465.00 | STATFJORD | SST | COCH | 0.6 | 1.9 | 1.0 | 1.0 | | NORSK HYDRO |
| 3465.40 | STATFJORD | SST/COAL | COCH | 0.8 | 1.7 | 1.0 | 0.9 | | NORSK HYDRO |
| 3468.75 | STATFJORD | SST | COPL | 0.5 | 2.1 | 1.0 | 1.0 | | NORSK HYDRO |
| 3472.50 | STATFJORD | SST | COPL | 0.5 | 2.7 | 1.0 | 1.0 | | NORSK HYDRO |
| 3473.46 | STATFJORD | SST | COCH | 0.5 | 2.0 | 1.0 | 1.0 | | NORSK HYDRO |

TABLE: 2.3.2

Petroleum Geochemistry Group
Research Centre Bergen



HYDRO

SATURATED FRACTION MOLECULAR RATIOS (OIL SAMPLES), WELL NOR:30/9-16

| St.Depth (m) | En.Depth (m) | Group/Fm | Name | Pristane/ nC17 | Pristane/ Phytane | CPI-I | CPI-II | nC17/ nC17+nC27 | Analysing Company |
|-----------------|-----------------|----------|----------|-------------------|----------------------|-------|--------|--------------------|----------------------|
| 2685.10 | 2694.10 | HEATHER | DST # 2 | 1.2 | 4.8 | 1.2 | 0.7 | | NORSK HYDRO |
| 2727.00 | 2727.00 | TARBERT | RFS 1057 | 1.0 | 2.6 | 1.0 | 0.9 | | NORSK HYDRO |
| 2722.00 | 2753.00 | TARBERT | DST # 1 | 1.0 | 2.3 | 1.0 | 0.9 | | NORSK HYDRO |



TABLE: 2.6.1

ISOTOPE ANALYSIS RESULTS (SEDIMENT SAMPLES), WELL NOR:30/9-16

| Depth (m) | Group/Fm. | Lithology | Type | d13C EXTR | d13C SAT | d13C ARO | d13C POL | d13C ASP | d13C KERO | Analysing Company |
|-----------|-----------|------------|------|-----------|----------|----------|----------|----------|-----------|-------------------|
| 2705.00 | HEATHER | SST | COPL | | -28.45 | -27.13 | | | | GEOLABNOR |
| 2707.00 | HEATHER | SST | COPL | | -28.40 | -27.68 | | | | GEOLABNOR |
| 2712.00 | HEATHER | SST | COPL | | -28.64 | -27.62 | | | | GEOLABNOR |
| 2718.00 | TARBERT | COAL | COCH | | -28.17 | -26.37 | | | | GEOLABNOR |
| 2720.90 | TARBERT | COAL | COCH | | -28.21 | -26.19 | | | | GEOLABNOR |
| 2721.00 | TARBERT | SST | COPL | | -28.71 | -27.59 | | | | GEOLABNOR |
| 2727.00 | TARBERT | SST | COCH | | -28.71 | -28.06 | | | | GEOLABNOR |
| 2740.46 | TARBERT | SST | COCH | | -28.82 | -27.92 | | | | GEOLABNOR |
| 2744.62 | TARBERT | SST | COCH | | -28.68 | -27.86 | | | | GEOLABNOR |
| 2749.50 | TARBERT | SST | COCH | | -28.73 | -27.90 | | | | GEOLABNOR |
| 2759.00 | TARBERT | SST | COCH | | -28.72 | -27.92 | | | | GEOLABNOR |
| 2764.00 | TARBERT | SST | COCH | | -28.55 | -27.97 | | | | GEOLABNOR |
| 2783.00 | TARBERT | COAL | COCH | | -27.97 | -25.43 | | | | GEOLABNOR |
| 3160.00 | DRAKE | CLYST | DC | | -30.99 | -30.09 | | | | GEOLABNOR |
| 3200.00 | DRAKE | CLYST/SLST | DC | | -30.73 | -28.57 | | | | GEOLABNOR |
| 3465.00 | STATFJORD | SST | COCH | | -28.01 | -26.48 | | | | GEOLABNOR |
| 3465.40 | STATFJORD | SST/COAL | COCH | | -28.53 | -25.48 | | | | GEOLABNOR |
| 3468.75 | STATFJORD | SST | COPL | | -28.23 | -26.36 | | | | GEOLABNOR |
| 3472.50 | STATFJORD | SST | COPL | | -28.29 | -26.26 | | | | GEOLABNOR |
| 3473.46 | STATFJORD | SST | COCH | | -28.29 | -26.21 | | | | GEOLABNOR |

TABLE: 2.6.2

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ISOTOPE ANALYSIS RESULTS (OIL SAMPLES), WELL NOR:30/9-16

| St.Depth (m) | En.Depth (m) | Group/Fm | Name | d13C OIL | d13C SAT | d13C ARO | d13C POL | d13C ASP | Analysing Company |
|-----------------|-----------------|----------|----------|-------------|-------------|-------------|-------------|-------------|----------------------|
| 2685.10 | 2694.10 | HEATHER | DST # 2 | -27.57 | -28.51 | -26.84 | -26.38 | | GEOLABNOR |
| 2727.00 | 2727.00 | TARBERT | RFS 1057 | -27.76 | -28.55 | -27.71 | -27.59 | | GEOLABNOR |
| 2722.00 | 2753.00 | TARBERT | DST # 1 | -28.13 | -28.81 | -28.05 | -27.74 | | GEOLABNOR |

GASTABS.XLS

Table 2.8.1 Gas volume composition data (from IFE)

| Well Name | EndDepth | Formation | Type | Lithology | Name | C1 % | C2 % | C3 % | iC4 % | nC4 % | iC5 % | nC5 % | CO2 % | Wetness % | i-C4/n-C4 |
|-----------|----------|-------------|------|-----------|---------|---------|---------|---------|----------|----------|----------|----------|----------|--------------|-----------|
| 30/9-16 | 2694.1 | HEATHER SST | GAS | SST | DST # 2 | 81.7 | 9.4 | 4.8 | 0.67 | 1.4 | 0.23 | 0.24 | 1.5 | 17.01 | 0.48 |
| 30/9-16 | 2753 | TARBERT | GAS | SST | DST # 1 | 78 | 10.9 | 6.3 | 0.87 | 1.7 | 0.27 | 0.26 | 1.7 | 20.65 | 0.51 |

Table 2.8.2 Isotope analysis results (gas) (from IFE)

| Well Name | EndDepth | Formation | Type | Lithology | Name | d13C C1 0/00 PDB | d13C C2 0/00 PDB | d13C C3 0/00 PDB | d13C nC4 0/00 PDB | d13C iC4 0/00 PDB | d2H C1 0/00 SMOW | d18O CO2 0/00 PDB | d13C CO2 0/00 PDB |
|-----------|----------|-------------|------|-----------|---------|---------------------|---------------------|---------------------|----------------------|----------------------|---------------------|----------------------|----------------------|
| 30/9-16 | 2694.1 | HEATHER SST | GAS | SST | DST # 2 | -41.1 | -27.8 | -26.1 | -26.7 | -24.2 | -174 | -13.3 | -15.5 |
| 30/9-16 | 2753 | TARBERT | GAS | SST | DST # 1 | -42.7 | -28.1 | -26.6 | -27.3 | -25.2 | -188 | -6.8 | -12.6 |