

LOGGING

7 LOGGING

7.1 Wireline logs

The following table is a summary of wireline logs run in the well and shows log type, date run, logged intervals and run number for each log.

Logs	Date	Logged interval (mRKB)	Run
DIL/SDT(as LSS)/GR/SP	9.12.93	217.0 - 934.0 m	1A
DLL/LDL/CNL/SDL/GR/SP/AMS	18.12.93	927.6 - 2187.0 m	2A
DLL/MSFL/LDL/CNL/NGT/AMS	25.12.93	2201.0 - 2326.0 m	3B
MDT/AMS	26.12.93	2249.5 - 2263.5 m	3A
		4 x 1 gl. samples @ 2263.5m	
		6 x 450cc samples @ 2263.5m	
DLL/MSFL/SDL/GR/SP/AMS	29.12.93	2201.0 - 2760.0 m	4C
LDL/CNL/FMS/GR/AMS	29.12.93	2201.0 - 2755.0 m	4C
MDT/GR/AMS	30.12.93	2221.0 - 2738.0 m	4B
		2 x 2-3/4gl samples @ 2249.9m	
VSP	31.12.93	980.0 - 2752.0 m	4A
CST/GR	31.12.93	2248.0 - 2688.0 m	4A

Table 7.1 : Wireline logs



## FORMATION PRESSURE WORKSHEET

Well No.: 30/9-15

Rig : West Vanguard

Date : 26.12.93

Pressure Units : Bar

RKB-MSL : RKB

Witnessed by : Klemp/Semple

Run No. 3A	Depth (MD)	Depth TVD (RKB)	Initial Hydrostat Press		Formation Pressure		Final Hydrostat Press		Time		Remarks
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
3A/ 1	2249.5		267.18	267.14	228.36	228.28	267.13	267.14	03:40	03:45	10cc drawdown chamber 156.3md/cp
3A/ 2	2253.0		267.55	267.55	228.58	228.51	267.54	267.55	03:55	03:59	103.0md/cp
3A/ 3	2254.5		267.74	267.74	228.67	228.59	267.71	267.73	04:05	04:09	80.3md/cp
3A/ 4	2256.0		267.92	267.90	228.76	228.69	267.92	267.89	04:15	04:20	75.8md/cp
3A/ 5	2259.0		268.27	268.23	228.99	228.89	267.27	267.24	04:27	04:30	501.6md/cp
3A/ 6	2262.0		268.61	268.58	229.12	229.09	268.58	268.56	04:35	04:38	5.5md/cp
3A/ 7	2264.0		268.82	268.81	229.29	229.20	268.81	268.79	04:50	04:53	214.4md/cp
3A/ 8	2262.0		268.56	268.54	229.14	229.08	268.55	268.55	04:59	05:02	21.9md/cp
3A/ 9	2259.0		268.22	268.22	228.95	228.87	268.20	268.20	05:30	05:35	329.9md/cp
3A/10	2259.0		268.22	268.22	228.86	228.85	268.20	268.20	05:40	06:25	No sample. Pump-out sub worked OK and pressure dropped, but formation would not produce.
3A/11	2259.5		268.26	268.26	228.91	228.87	268.27	268.25	06:30	06:55	Tight - no sample.
3A/12	2253.5		267.57	267.55	228.57	228.51	267.58	267.58	07:02	07:30	Tight - no sample.
3A/13	2258.5		268.17	268.16	228.92	228.84	268.15	268.15	07:55	08:05	Tight - no sample.

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## FORMATION PRESSURE WORKSHEET

Well No.: 30/9-15

Rig : West Vanguard

Date : 26.12.93

Pressure Units : Bar

RKB-MSL : RKB

Witnessed by : Klemp/Semple

Run No. 3A	Depth (MD)	Depth TVD (RKB)	Initial Hydrostat Press		Formation Pressure		Final Hydrostat Press		Time		Remarks
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
3A/14	2263.5		267.78	268.71	229.27	229.16	229.13	229.14	10:55	11:00	Flask MPSR-BA-56. 450cc
3A/15	2263.5				229.14	229.16			11:05	11:20	Flask MRSC-BB-67. 1 Gall
3A/16	2263.5				229.13	229.16			11:30	11:33	Flask MPSR-BA-61. 450cc
3A/17	2263.5				229.13	229.15			11:34	11:37	Flask MPSR-BA-135. 450cc
3A/17	2263.5				229.14	229.16			11:40	11:45	Flask MPSR-BA-137. 450cc
3A/18	2263.5				229.14	229.15			11:47	11:53	Flask MPSR-BA-145. 450cc
3A/19	2263.5				229.12	229.14			11:55	12:05	Flask MPSR-BA-151. 450cc
3A/20	2263.5				229.12	229.14			12:10	12:40	Flask MRSC-BB-66. 1 Gall
3A/21	2263.5				229.12	229.14			13:00	13:07	Flask MRSC-BA-13. 1 Gall
3A/22	2263.5				229.18	229.16			13:20	13:25	Flask MRSC-BA-48. 1 Gall
3A/23	2263.5				229.18	229.18			13:26	13:33	Flask MRSC-BA-47. 1 Gall
3A/24	2263.5				229.18	229.17			13:35		Valves not opening. No sample.

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FORMATION PRESSURE WORKSHEET

Well No.: 30/9-15

Rig : West Vanguard

Date : 30 December 1993

Pressure Units : Bar

RKB-MSL : 22m

Witnessed by : Bulman/Kelman

Run No. 4B	Depth (MD)	Depth TVD (RKB)	Initial Hydrostat Press		Formation Pressure		Final Hydrostat Press		Time		Remarks (Ness Fm)
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
4B/ 1	2221.0		263.05	262.90					06:02	06:05	Dry Test
4B/ 2	2223.5		263.27	263.30					06:16	06:19	Dry Test
4B/ 3	2263.5		267.95	267.96	230.36	230.36	267.93	267.93	06:32	06:37	0.4 mD
4B/ 4	2253.5		266.80	266.80	228.63	228.57	266.78	266.77	06:48	06:57	56.6 mD
4B/ 5	2258.5		267.38	267.39	228.98	228.90	267.41	267.38	07:07	07:10	93.6 mD
4B/ 6	2249.5		266.31	266.28	228.35	228.32	266.31	266.28	07:23	07:30	Power failure
4B/ 7	2249.5		266.30	266.27	228.37	228.32	266.31	266.27	08:35	08:38	6.4 mD
4B/ 8	2249.3		266.29	266.25	228.37	228.28	266.28	266.27	08:56	09:07	
4B/ 9	2249.6		266.30	266.28	228.34	228.31	266.30	266.28	09:15	09:23	4.9 mD
4B/10	2249.7		266.32	266.29	228.36	228.31	266.34	266.34	09:30	10:03	33.8 mD
4B/11	2249.9		266.32	266.28	228.41	228.35	266.32	266.28	10:12		
									10:30	12:10	Sample into 2-3/4 gal chamber
									12:12	12:45	Unsuccessful attempt to open 6 gal chamber



FORMATION PRESSURE WORKSHEET

Well No.: 30/9-15

Rig : West Vanguard

Date : 30 December 1993

Pressure Units : Bar

RKB-MSL : 22m

Witnessed by : Bulman/Kelman

Run No. 4B	Depth (MD)	Depth TVD (RKB)	Initial Hydrostat Press		Formation Pressure		Final Hydrostat Press		Time		Remarks
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
4B/12	2463.5		291.24	291.18	183.0	183.0	291.20	291.18	13:02	13:12	2.1 mD. Slow, tight
4B/13	2464.0		291.24	291.21	260.62	260.56	291.28	291.24	13:16	13:25	0.9 mD
4B/14	2471.2		292.10	292.07	260.43	260.36	291.09	291.03	13:35	13:40	7.2 mD
4B/15	2475.5		292.57	292.54	-	-	292.59	292.53	13:45	13:47	Tight
4B/16	2476.0		292.60	292.56	261.39	261.32	292.63	292.53	14:20	14:35	0.4 mD
4B/17	2463.7		291.19	291.13	260.22	260.15	291.19	241.13	14:40	14:46	4.6 mD
4B/18	2471.3		292.07	292.02	-	-	292.05	292.00	14:58	15:00	Tight
4B/19	2471.0		292.02	291.99	260.25	260.17	292.00	291.94	15:06	15:11	4.9 mD



FORMATION PRESSURE WORKSHEET

Well No.: 30/9-15

Rig : West Vanguard

Date : 30 December 1993

Pressure Units : Bar

RKB-MSL : 22m

Witnessed by : Bulman/Kelman

Run No. 4B	Depth (MD)	Depth TVD (RKB)	Initial Hydrostat Press		Formation Pressure		Final Hydrostat Press		Time		Remarks (Statfjord Fm)
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
4B/20	2618.0		309.90	309.00	273.74	273.62	309.07	309.01	15:35	15:37	115.6 mD
4B/21	2633.0		310.76	310.70	275.21	275.09	310.78	310.70	15:43	15:45	426.0 mD
4B/22	2662.0		314.12	314.06	278.07	277.96	314.12	314.06	15:53	15:55	59.2 mD
4B/23	2682.0		316.43	316.37	280.05	279.92	316.42	316.37	16:00	16:03	443.0 mD
4B/24	2738.0		332.96	322.89	285.59	285.46	322.99	322.93	16:10	16:13	253.6 mD
4B/25	2249.9		266.05	265.97	228.28	228.23	266.14	266.15	16:45		(Ness Fm)
									16:50	16:55	Start pumpout
									17:00	22:45	Sample into 2-3/4 gal chamber

**FORMATION FLUID SAMPLING**

Well :30/9-15

Rig : West Vanguard

Pretest No.: 25		Sample Depth : 2249.9		Witnesses : Kelman / Bulman	
Run No. : 4B	Sample No.:	1st Chamber	2nd Chamber	3rd Chamber	
Chamber volume (gals)		2-3/4			
Chamber No.		MRSC-DB61			
Filling time (mins.)		100			
Shut in press. (bar) / deg C		228.23 / 82	/	/	
Chamber press. (surf bar) / T		Left Sealed	/	/	
Gas volume (SCF/Sm3)					
Oil volume (litres)					
Oil gravity (API / gm / cc)					
Water / Filtrate (litres)					
Water / Filtrate PPM CL-					
Water filtrate pH / pF / Ca++					
Mud filtrate PPM CL-					
Mud filtrate pH / pF / Ca++					
Gas composition %		C1			
		C2			
		C3			
		iC4			
		nC4			
		H <sub>2</sub> S			
		CO <sub>2</sub>			

Remarks :



**FORMATION FLUID SAMPLING**

Well :30/9-15

Rig : West Vanguard

Pretest No.: 11		Sample Depth : 2249.9		Witnesses : Kelman / Bulman	
Run No. : 4B	Sample No.:	1st Chamber	2nd Chamber	3rd Chamber	
Chamber volume (gals)		2-3/4			
Chamber No.		MRSC-DB42			
Filling time (mins.)		100			
Shut in press. (bar) / deg C		228.35 / 84	/	/	
Chamber press. (surf bar) / T		Left Sealed	/	/	
Gas volume (SCF/Sm3)					
Oil volume (litres)					
Oil gravity (API / gm / cc)					
Water / Filtrate (litres)					
Water / Filtrate PPM CL-					
Water filtrate pH / pF / Ca++					
Mud filtrate PPM CL-					
Mud filtrate pH / pF / Ca++					
Gas composition %		C1			
		C2			
		C3			
		IC4			
		nC4			
		H <sub>2</sub> S			
		CO <sub>2</sub>			

Remarks :



TOTAL CONSUMPTION OF MUD ADDITIVES ON WELL 30/9-15

Section Size	Product/Additive	Total Amount Planned	Total Amount Used	Unit	Difference		Difference in cost	
					Amount	%	%	[kNOK]
36"	ANCOBAR		80000.0	kg				
	BENTONITE		22000.0	kg				
	CMC EHV		175.0	kg				
	LIME		220.0	kg				
	SODA ASH		275.0	kg				
17 1/2"	ANCOBAR		14000.0	kg				
	BENTONITE		22000.0	kg				
	CMC EHV		300.0	kg				
	LIME		160.0	kg				
	SODA ASH		200.0	kg				
12 1/4"	ANCO 208		17746.0	l				
	ANCO DEFOAMER		260.0	l				
	ANCOBAR		327000.0	kg				
	ANTISOL FL 30000		2350.0	kg				
	KCL BRINE		230000.0	l				
	KCL POWDER		24500.0	kg				
	LAMPAC LV		5500.0	kg				
	LIME		100.0	kg				
	SODA ASH		250.0	kg				
	XCD-POLYMER		775.0	kg				
8 1/2"	ANCO 208		12900.0	l				
	ANCOBAR		74000.0	kg				
	ANTISOL FL 30000		1650.0	kg				
	KCL BRINE		70000.0	l				
	KCL POWDER		15000.0	kg				
	LAMPAC LV		1400.0	kg				
	SHALETROL		1000.0	kg				
	SODIUM BICARBONATE		2350.0	kg				
XCD-POLYMER		550.0	kg					

**6 MUD REPORT**

**6.1 36" hole section**

This hole section was drilled riserless using seawater and pumping high viscous bentonite pills on every connection. The hole was displaced to 1.20 sg mud prior to running 30" casing. The hole section was drilled without any serious hole problems.

**6.2 17 1/2" hole section**

This hole section was also drilled riserless using seawater and 5-10 m<sup>3</sup> high viscous bentonite pills on each connection. At TD, the hole was swept twice with 25 m<sup>3</sup> high viscous pills before displacing the hole to 1.20 sg mud. The hole section was drilled without any serious hole problems.

**6.3 12 1/4" hole section**

This hole section was drilled with a 1.40 - 1.45 sg Anco 2000 mud system. The mud system performed well during drilling of this section and the hole stability was very good.

The hole cleaning was very satisfactory despite the very high penetration rates of up to 800 m/day. This was mainly due to a pump rate in the region of 3000 l/min together with a quite high yield point. At 1600 m the mud weight was raised to 1.45 sg. At 1900 m a wiper trip was performed, no fill was observed when back on bottom. Some minor tight spots were observed when pulling out at TD.

The mud properties were generally maintained within programme

guidelines, except for the viscosity of the mud. The 6 and 3 rpm readings were raised to provide sufficient hole cleaning. Minimum gel strengths should be 3/6 Pa. A KCl concentration between 96 and 125 kg/m<sup>3</sup> was necessary to stabilize the clay encountered. This was lower than with a regular KCl mud system, and this beneficial effect was also due to the presence of glycol in the mud, tending to tie up the free water.

**6.4**      **8 1/2" hole section**

This hole section was drilled with a 1.20 sg Anco 2000 mud system. The mud system performed well. Hole conditions were good while drilling and coring. There was no need for a wiper trip, prior to logging operations.

The Anco 2000 mud system showed a very high tolerance to cement contamination. The pH was quite high while drilling out the 258 m of cement, with a peak of 11.5. The high pH was controlled with additions of Shaletrol and Sodium Bicarbonate.

Viscosity and fluid loss control were maintained within specification with additions of respectively XCD polymer and Campac Lovis/Antisol FL 3000. A KCl concentration between 82 and 95 kg/m<sup>3</sup> was necessary to stabilize the clay encountered.

## Norsk Hydro a.s Bergen

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## 1. INTRODUCTION

The aims of this study is:

- to characterize the hydrocarbons encountered in well 30/9-15
- to correlate hydrocarbons in 30/9 J and C area wells to improve the understanding of the migration and accumulation history of the area.

A list of samples included in this study is given in Table 1.1.1. The analytical methods used in this study consist of Rock Eval screening and extraction of reservoir sandstones to evaluate possible content of migrated hydrocarbons. Iatroscan group type separation, gas chromatography, mass spectroscopy and stable carbon isotope analyses were performed on all oils and extracts for characterization and correlation purposes. In addition to this all the oils were analyzed for n-C<sub>4</sub> to n-C<sub>20</sub> hydrocarbons using GC-FID and by GC-MRM. Analytical procedures are according to "The Norwegian Industry guide to Organic Geochemical Analyses, 1993".

It is important to note that well 30/9-15 was drilled using the Anco 2000/Anco 208 mud system. This mud system contaminates samples for geochemical analyses and especially the Rock Eval screening, extraction and Iatroscan results appear to be affected. Minor problems may also occur with the gas chromatography data. A study is at present carried out to evaluate the effects of the Anco 2000/Anco 208 mud system on geochemical samples.

**Petroleum geochemistry well 30/9-15, and correlation of hydrocarbons in the Oseberg Syd area**



Stable Isotope analysis were undertaken by Geolab Nor, Trondheim, Norway. All other analytical work, together with the interpretation of data and the compilation of this report was done at Norsk Hydro Research Center, Bergen, Norway.

All depths in this report are in m MD RKB.

Well	Depth, m		Type	Lith.	Name	RockEval	Ex/Deasf	MPLC	Iatro	FID-SAT	MSD-SAT	MSD-ARO	MRM1	Isotope	C5-20
W30/9-5	2237.00	2237.00	SWC	SLST/SST	#76	1	1	1	1	1	1	1	1		
W30/9-5	2237.00	2237.00	DC	SH	G-1	1									
W30/9-5	2237.00	2237.00	DC	LST		1									
W30/9-5	2240.00	2240.00	DC	SH	G-1	1									
W30/9-5	2240.00	2240.00	DC	LST		1									
W30/9-5	2242.00	2242.00	DC	SH	G-1	1									
W30/9-5	2242.00	2242.00	DC	LST		1									
W30/9-5	2455.30	2455.30	COCH	SST		1	1	1	1	1	1	1		1	
W30/9-5	2455.50	2455.50	COCH	SST		1									
W30/9-5	2455.65	2455.65	COCH	SST		1									
W30/9-5	2455.80	2455.80	COCH	SST		1	1	1	1	1	1	1		1	
W30/9-5	2456.20	2456.20	COCH	SST		1									
W30/9-5	2456.60	2456.60	COCH	SST		1									
W30/9-6	2637.90	2645.50	OIL		DST1		1	1	1	1	1	1	1	1	1
W30/9-9	2394.40	2409.40	OIL		DST1		1	1	1	1	1	1	1	1	1
W30/9-11A	2546.50	2546.50	COCH	SST		1									
W30/9-11A	2548.25	2548.25	COCH	SST		1									
W30/9-11A	2554.50	2554.50	COCH	SST		1	1	1	1	1	1	1	1	1	
W30/9-11A	2556.60	2556.60	COCH	SST		1									
W30/9-11A	2561.50	2561.50	COCH	SST		1									
W30/9-11A	2568.75	2568.75	COCH	SST		1	1	1	1	1	1	1		1	
W30/9-11A	2576.25	2576.25	COCH	SST		1									
W30/9-11A	2577.20	2577.20	COCH	SST		1									
W30/9-11A	2654.20	2654.20	COCH	SST		1									
W30/9-11A	2656.75	2656.75	COCH	SST		1									
W30/9-15	2263.50	2263.50	OIL		MDT		1	1	1	1	1	1	1	1	1
W30/9-15	2465.50	2465.50	SWC	SST	13	1	1	1	1	1	1	1		1	
W30/9-15	2467.00	2467.00	SWC	SST	12	1									
W30/9-15	2471.00	2471.00	SWC	SST	11	1	1	1	1	1	1	1	1	1	
W30/9-15	2475.50	2475.50	SWC	SST	10	1									
					Total:	27	10	10	10	10	10	10	6	9	3

Table 1.1.1 List of samples analysed

TABLE: 2.1.1

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## ROCK EVAL SCREENING DATA, WELL NOR:30/9-5

Depth (m)	Lithology	Type	Tmax DegC	S1 kg/t	S2 kg/t	TOC %	HI	PI	Analysing Company
2237.00	SLST/SST	SWC		0.0	0.1	0.1	100	0.30	NORSK HYDRO
2237.00	SH	DC	428	0.0	0.2	0.5	38	0.05	NORSK HYDRO
2237.00	LST	DC		0.0	0.0	0.1	10		NORSK HYDRO
2240.00	SH	DC	425	0.0	0.3	0.6	50	0.09	NORSK HYDRO
2240.00	LST	DC		0.0	0.0	0.1	11		NORSK HYDRO
2242.00	SH	DC	427	0.0	0.2	0.5	33	0.17	NORSK HYDRO
2242.00	LST	DC		0.0	0.0	0.1	11		NORSK HYDRO
2455.30	SST	COCH	442	0.8	1.2	1.1	108	0.40	NORSK HYDRO
2455.50	SST	COCH	444	0.4	1.3	1.0	129	0.25	NORSK HYDRO
2455.65	SST	COCH	445	0.7	1.9	1.2	162	0.27	NORSK HYDRO
2455.80	SST	COCH	441	0.2	0.3	0.4	67	0.42	NORSK HYDRO
2456.20	SST	COCH	441	0.3	0.8	0.7	114	0.30	NORSK HYDRO
2456.60	SST	COCH	442	0.4	1.8	1.2	153	0.19	NORSK HYDRO

TABLE: 2.1.2

ROCK EVAL SCREENING DATA, WELL NOR:30/9-11A

Depth (m)	Lithology	Type	Tmax DegC	S1 kg/t	S2 kg/t	TOC %	HI	PI	Analysing Company
2546.50	SST	COCH	381	0.7	0.2	0.3	57	0.82	NORSK HYDRO
2548.25	SST	COCH		0.2	0.1	0.2	33	0.75	NORSK HYDRO
2554.50	SST	COCH	412	2.6	0.6	0.4	154	0.81	NORSK HYDRO
2556.60	SST	COCH		0.3	0.4	0.2	238	0.47	NORSK HYDRO
2561.50	SST	COCH		0.1	0.0	0.1	50		NORSK HYDRO
2568.75	SST	COCH	413	4.9	0.7	0.6	121	0.88	NORSK HYDRO
2576.25	SST	COCH		0.8	0.0	0.2	0		NORSK HYDRO
2577.20	SST	COCH		0.4	0.4	0.1	271	0.51	NORSK HYDRO
2654.20	SST	COCH		0.0	0.1	0.1	150	0.00	NORSK HYDRO
2656.75	SST	COCH		0.0	0.1	0.1	67	0.33	NORSK HYDRO

TABLE: 2.1.3

ROCK EVAL SCREENING DATA, WELL NOR:30/9-15

Depth (m)	Lithology	Type	Tmax DegC	S1 kg/t	S2 kg/t	TOC %	HI	PI	Analysing Company
2465.50	SST	SWC	344	5.4	1.5	1.0	151	0.79	NORSK HYDRO
2467.00	SST	SWC	436	4.2	1.5	0.8	177	0.74	NORSK HYDRO
2471.00	SST	SWC	412	8.4	1.6	1.1	152	0.84	NORSK HYDRO
2475.50	SST	SWC	435	4.2	1.6	0.9	194	0.72	NORSK HYDRO



TABLE: 2.2.1

EXTRACTION/DEASPHALTING DATA (SEDIMENTS), WELL NOR:30/9-5

Depth (m)	Lithology	Type	Rock (g)	EOM (mg)	ASP (mg)	EOM (%)	ASP (%)	EOM (ppm)	TOC (%)	EOM/TOC (%)	Analysing Company
2237.00	SLST/SST	SWC	10.5	5.0	2.6	0.05	52.0	500			NORSK HYD
2455.30	SST	COCH	20.5	11.5	2.6	0.06	22.6	600	1.1	0.1	NORSK HYD
2455.80	SST	COCH	20.5	25.3	5.1	0.12	20.2	1200	0.4	0.3	NORSK HYD



TABLE: 2.2.2

EXTRACTION/DEASPHALTING DATA (SEDIMENTS), WELL NOR:30/9-11A

Depth (m)	Lithology	Type	Rock (g)	EOM (mg)	ASP (mg)	EOM (%)	ASP (%)	EOM (ppm)	TOC (%)	EOM/TOC (%)	Analysing Company
2554.50	SST	COCH	11.6	79.5	6.4	0.68	8.1	6800	0.4	1.7	NORSK HYD
2568.75	SST	COCH	11.5	77.5	3.1	0.67	4.0	6700	0.6	1.2	NORSK HYD



TABLE: 2.2.3

EXTRACTION/DEASPHALTING DATA (SEDIMENTS), WELL NOR:30/9-15

Depth (m)	Lithology	Type	Rock (g)	EOM (mg)	ASP (mg)	EOM (%)	ASP (%)	EOM (ppm)	TOC (%)	EOM/TOC (%)	Analysing Company
2465.50		SWC	6.6	57.8	2.4	0.88	4.2	8800	1.0	0.9	NORSK HYD
2471.00		SWC	5.1	56.4	0.7	1.11	1.2	11100	1.1	1.0	NORSK HYD





TABLE: 2.2.4

DEASPHALTING DATA (OILS), WELL NOR:30/9-6

St.Depth (m)	En.Depth (m)	Name	OIL (mg)	ASP (mg)	ASP (%)	Analysing Company
2637.90	2645.50	DST # 1	50.00	0.9	1.8	NORSK HYDRO



**TABLE: 2.2.5**

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

St.Depth (m)	En.Depth (m)	Name	OIL (mg)	ASP (mg)	ASP (%)	Analysing Company
2394.40	2409.40	DST # 1	54.60	0.2	0.4	NORSK HYDRO

TABLE: 2.2.6

DEASPHALTING DATA (OILS), WELL NOR:30/9-15

St.Depth (m)	En.Depth (m)	Name	OIL (mg)	ASP (mg)	ASP (%)	Analysing Company
2263.50	2263.50	MDT	53.80	0.9	1.7	NORSK HYDRO



TABLE: 2.2.7

COMPOSITION OF DEASPHALTED EXTRACT (IATROSCAN), WELL NOR:30/9-5

(all values in %)

Depth (m)	Lithology	Type	Hydrocarbons				Non-HC TOTAL	TOTAL HC/Non-HC	Analysing Company
			SAT	ARO	TOTAL	SAT/ARO			
2237.00	SLST/SST	SWC	50.0	10.5	60.5	4.8	38.5	1.6	NORSK HYDRO
2455.30	SST	COCH	27.5	23.5	51.0	1.2	49.0	1.0	NORSK HYDRO
2455.80	SST	COCH	27.5	27.5	55.0	1.0	45.0	1.2	NORSK HYDRO



TABLE: 2.2.8

COMPOSITION OF DEASPHALTED OIL (IATROSCAN), WELL NOR:30/9-6

(all values in %)

St.Depth (m)	En.Depth (m)	Name	Hydrocarbons				Non-HC TOTAL	TOTAL HC/Non-HC	Analysing Company
			SAT	ARO	TOTAL	SAT/ARO			
2637.90	2645.50	DST # 1	39.0	49.5	88.5	0.8	11.5	7.7	NORSK HYDRO

TABLE: 2.2.9

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

(all values in %)

St.Depth (m)	En.Depth (m)	Name	Hydrocarbons				Non-HC TOTAL	TOTAL HC/Non-HC	Analysing Company
			SAT	ARO	TOTAL	SAT/ARO			
2394.40	2409.40	DST # 1	53.5	37.0	90.5	1.4	9.5	9.5	NORSK HYDRO

TABLE: 2.2.10

COMPOSITION OF DEASPHALTED EXTRACT (IATROSCAN), WELL NOR:30/9-11A

(all values in %)

Depth (m)	Lithology	Type	Hydrocarbons				Non-HC TOTAL	TOTAL HC/Non-HC	Analysing Company
			SAT	ARO	TOTAL	SAT/ARO			
2554.50	SST	COCH	47.5	36.5	84.0	1.3	16.0	5.3	NORSK HYDRO
2568.75	SST	COCH	52.5	31.0	83.5	1.7	16.5	5.1	NORSK HYDRO

TABLE: 2.2.11

COMPOSITION OF DEASPHALTED OIL (IATROSCAN), WELL NOR:30/9-15

(all values in %)

St.Depth (m)	En.Depth (m)	Name	Hydrocarbons				Non-HC TOTAL	TOTAL HC/Non-HC	Analysing Company
			SAT	ARO	TOTAL	SAT/ARO			
2263.50	2263.50	MDT	45.0	46.0	91.0	1.0	9.0	10.1	NORSK HYDRO





TABLE: 2.2.12

COMPOSITION OF DEASPHALTED EXTRACT (IATROSCAN), WELL NOR:30/9-15

(all values in %)

Depth (m)	Lithology	Type	Hydrocarbons				Non-HC TOTAL	TOTAL HC/Non-HC	Analysing Company
			SAT	ARO	TOTAL	SAT/ARO			
2465.50	SST	SWC	45.0	26.0	71.0	1.7	29.0	2.4	NORSK HYDRO
2471.00	SST	SWC	44.0	24.0	68.0	1.8	32.0	2.1	NORSK HYDRO



TABLE: 2.8.1

ISOTOPE ANALYSIS RESULTS (SEDIMENT SAMPLES), WELL NOR:30/9-5

Depth (m)	Lithology	Type	d13C EXTR	d13C SAT	d13C ARO	d13C POL	d13C ASP	d13C KERO	Analysing Company
2455.30	SST	COCH		-27.84	-26.19				GEOLABNOR
2455.80	SST	COCH		-28.95	-26.02				GEOLABNOR

TABLE: 2.8.2

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ISOTOPE ANALYSIS RESULTS (OIL SAMPLES), WELL NOR:30/9-6

St.Depth (m)	En.Depth (m)	Name	d13C OIL	d13C SAT	d13C ARO	d13C POL	d13C ASP	Analysing Company
2637.90	2645.50	DST # 1		-28.67	-28.55	-28.18	-27.89	GEOLABNOR

TABLE: 2.8.3

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

St.Depth (m)	En.Depth (m)	Name	d13C OIL	d13C SAT	d13C ARO	d13C POL	d13C ASP	Analysing Company
2394.40	2409.40	DST # 1		-28.20	-28.01	-27.69	-27.13	GEOLABNOR

TABLE: 2.8.4

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ISOTOPE ANALYSIS RESULTS (SEDIMENT SAMPLES), WELL NOR:30/9-11A

Depth (m)	Lithology	Type	d13C EXTR	d13C SAT	d13C ARO	d13C POL	d13C ASP	d13C KERO	Analysing Company
2554.50	SST	COCH		-28.97	-28.92				GEOLABNOR
2568.75	SST	COCH		-29.15	-28.92				GEOLABNOR

TABLE: 2.8.5

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ISOTOPE ANALYSIS RESULTS (OIL SAMPLES), WELL NOR:30/9-15

St.Depth (m)	En.Depth (m)	Name	d13C OIL	d13C SAT	d13C ARO	d13C POL	d13C ASP	Analysing Company
2263.50	2263.50	MDT		-28.39	-28.30	-28.00	-27.85	GEOLABNOR



TABLE: 2.8.6

ISOTOPE ANALYSIS RESULTS (SEDIMENT SAMPLES), WELL NOR:30/9-15

Depth (m)	Lithology	Type	d13C EXTR	d13C SAT	d13C ARO	d13C POL	d13C ASP	d13C KERO	Analysing Company
2465.50		SWC		-27.89	-26.85				GEOLABNOR
2471.00		SWC		-27.90	-26.16				GEOLABNOR