

# DST RESULTS

WELL: 30/6-9

DST 1	DST 4
<p>Perforated interval: 2612,5—2615,5 m Choke size: 32/64" Flow rates: 3330 BBLS/D, grav. 33,2° API 2,07 MMSCF/D, grav: 0,679 GOR: 620 SCF/BBL</p>	<p>Perforated interval: 2498—2501 m Choke size: 40/64" Flow rates: 1260 BBLS/D, grav: 54,8° API- 22,7 MMSCF/D, grav: 0,662 GOR: 18 000 SCF/BBL</p>
DST 2	DST 5
<p>Perforated interval: 2554—2559 m Choke size: 32/64" Flow rates: 3490 BBLS/D, grav: 33,5° API 2,32 MMSCF/D, grav: 0,678 GOR: 666 SCF/BBL</p>	<p>Perforated interval: 2460—2463 m Choke size: 40/64" Flow rates: 1190 BBLS/D, grav: 60,2° API 23,8 MMSCF/D, grav: 0,670 GOR: 20 000 SCF/BBL</p>
DST 3	
<p>Perforated intervals: 2537,3—2540 m and 2542,5—2547 m Choke size: 30/64" Flow rates: 2700 BBLS/D, grav: 34° API 1,84 MMSCF/D, grav: 0,675 GOR: 682 SCF/BBL</p>	

Checked: B. Læ  
Date: 16.5.83

6.3 MUDREPORT 30/6-9

36" hole section

This hole section was drilled using seawater with highviscosity spotted on connections.

26" hole section

The 17 1/2" pilot hole was drilled using prehydrated bentonite and seawater. Hivis pill was spotted on each connection. At TD the hole was circulated with 16 m<sup>3</sup> hiviscosity mud. After logging the hole was underreamed to 26". Mudlosses was noticed due to leaking balljoint.

When running in hole with 26" bit tight spots had to be reamed through at 778 m and 834 m. Before running casing, 193 m<sup>3</sup> of hiviscosity mud was circulated into the hole.

17 1/2" hole section

The 17 1/2" hole was drilled using a KCL-polymer system, based on a KCL concentration of 35-40 ppb and and a mixture of polymers for rehology, inhibition and fluidlogg. The hole was drilled to 2400 m.

During drilling, tight conuections and hole problems were noticed especially around 1200 m to 1300 m, 1600 m to 1800 m and from 2000 m to 2200 m.

During this section the mudweight was increased from 1.07 SG to 1.46 SG. The explenation for theses problems is as following.

1. A KCL quality giving high pH,  $\text{Ca}^{2+}$  and  $\text{Mg}^{2+}$  was sent out to the rig. This effected the efficiency of the polymers.
2. A solids problem was badly effecting the coating ability of the polyacrylamide copolymer. Means that new formation beeing drilled didn't get sufficient coating and inhibition to prevent swelling.
3. It's recommended to increase the KCL concentration. The addition of KCL should be determined by the  $\text{K}^+$  concentration and not the  $\text{CL}^-$  concentration, as done during drilling this section.

#### 12 1/2" hole section

The 12 1/4" hole section was drilled using the same fluid as in the 17 1/2" section. Fluid loss was decreased by adding polysaccharide. No problems are reported during this section.

#### 8 3/8" hole section

This section was drilled using a lignite/lignosulfonate freshwater system.

# NORSK PETROLEUM SERVICES A/S.

OPERATING AREA North Sea Norway

Norsk Hydro 30/6 - 9

## TOTAL MATERIAL CONSUMPTION

MATERIAL	PACKAGING	QUANTITY
Alcomer	25 kg	120
Bicarbonate	50 kg	136
Baroid	M/T	662
Bentontite	M/T	106
Caustic Soda	25 kg	36
Desco	25 lb	1
Dextrid	50 lb	1402
CMC (Lovis)	25 kg	58
CC-16	50 lb	6
Brine	bbl	2232
Torg Trim II	55 gal	5
Soda Ash	50 kg	129
Surflo W-300	55 gal	7
Wallnut	25 kg	36
Mica	25 kg	2
Lime	40 kg	23
Potash (KCL)	50 kg	1220
XC Polymer	50 lb	168

30" csg Section I	- \$	3540.00
20" csg Section II	- \$	20756.72
13 3/8" csg Section III	- \$	211302.51
9 5/8" csg Section IV	- \$	56347.75
8 3/8" csg Section V	- \$	43490.03
Testing - Section VI	- \$	12017.03
Total cost	\$	<u>347 454.00</u>
Cost/meter	\$	99.96
15372 bbls built		
cost/bbl	\$	22.60

**WELL NAME:** 30/6 - 9 Norsk Hydro

**MUD PROPERTY RECAP**

DATE	DEPTH	DENSITY	VISC-OSITY	FILTRATE		HY/HP III		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER					
				feet	PPG/Spcl/SG	secs	Cake		°500pal	PV	YP	10'	10'	Cl	Ca	PI	MI	Pm	Oil	Water		Corr. Solids	PPB	Ma	ppm	KCLpph	Sand%
28/8			120	N/C				8.0					15000	70	0	.1		0	99	1	30	50					
29/8	219.5		ND	Mud in pits																							
30/8	293	1.06	50	N/C				8.8	10	12.5	7.5	10	22000	440	.05	.1		0	98	2	22.5	320					
31/8	965	1.1	40	N/C				8.8	5	14	7.5	10	15000	300	0	.01		0	96.5	3.5	20	300			1/4		
1/9	237	1.09	65	N/C	2			9.8	5	50	10	12	13000	180	.1	.2		0	95	5	20.0	440			1/4		
2/9	738	1.11	53	N/C	3			9.15	5	27.5	10	11.5	15000	450	.05	.1		0	94	6	22.5	550			1/4		
3/9	975	1.10	40	N/C	3			8.4	7	12	8	10	13000	500	0	.1		0	95	5	22.5	400			trace		
4/9	No mud in pits																										
5/9	975	1.07	46	8.0	1			8.8	10	5	1.5	1.5	63000	200	0	.1		0	96	4	0	200	46		0		
6/9	975	1.20	46	6.8	1			8.8	18	11	1.5	1.5	63000	200	.1	.2		0	94	6	0	200	46		0		
7/9	1124	1.20	43	5.0	1			8.5	13	10	1.5	1.5	55000	275	.15	.3	.9	0	90	10	0	50	39		trace		
8/9	1370	1.23	44	5.4	1			8.6	16	9.5	3	5	65000	120	.15	.3	.9	9	90	10	15	280	47		1.5		
9/9	1520	1.3	58	6.1	2			8.44	17	15	4.5	11	50000	150	.23	.43		0									
10/9	1764	1.305	57	8.0	2			8.0	20	12.5	5	13	50000	140	.2	.35		0	85	15	17.5	280	40		1.5		
11/9	2064	1.33	62	10	2			7.83	20	10	3.5	15	54000	200	0			0	84	16	20	366	32		1.5		
12/9	2120	1.33	62	11	3			7.88	14	10	3.2	16	56000	200	0			0	84	16	21	307	36		2		
13/9	2266	1.4	75	9.5	1.5			7.66	17	9.9	3.2	16	70000	200	0			0	82	18	21	350	31		1/2		
14/9	2292	1.39	85	7.9	1			7.64	22	10	4.7	18	65000	80	0			0	83	17	22	512	32		3/4		
15/9	2300	1.39	68	7.5	1			7.71	25	10	6	18	53000	0	0			0	82	18	22	439	30		3/4		

**WELL NAME:** 30/6 - 9 Norsk Hydro.

**MUD PROPERTY RECAP**

DATE	DEPTH feet metres	DENSITY PPG/ Spcl/ SG	VISC- OSITY secs	FILTRATE ccs	HY/HP IIII		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC PPB	OTHER			
					Cake 1 1/2 32/mm	°500psl ccs		PV cp	YP lbs/100R <sup>1</sup> -gms/100 cm <sup>2</sup>	10" 10'	10" 10'	Cl mg/litre	Ca ppm	PI	MI	Pm	Oil %	Water %	Corr. Solids %		Bent. Eq.	Mg ppm	KCL ppb	Sand%
16/9	2400	1.46	68	7.4	1.5		7.45	23	12	4	19	57000	0	0			0	80	20	23	512	32	1/2	
17/9	2400	1.46	78	7.4	1		7.73	22	11	3.4	19	57000	0	0			0	80	20	23	486	32	1/2	
18/9	2384	1.36	58	7.5	1		8.0	18	10	4	20	57000	400	0			0	84	16	23	317	32	1/2	
19/9	2384	1.46	57	7	1	9	4	9.32	20	8.5	4.7	23	54000	800			0	82	18	23	120	32	1/2	
20/9	2403	1.36+	47	11	2	18	4	11.45	15	5	0.95	7	48000	660			0	85	15	23	0	30	1/4	
21/9	2430	1.36	47	9	1	14	2	9.8	19	5	6	16	48000	660	.4	.8	0	85	15	23	96	28	1/2	
22/9	2462	1.36	50	7	1	12	2	9.8	13	5	1.3	17	55000	320	.2	.4	0	85	15	18	0	30	1/4	
23/9	2484	1.35	59	4.5	1	10	1	9.8	18	7	7	23	58000	160	.2	.4	0	87	13	15	96	29	trace	
24/9	2500	1.37	54	3.5	.5	9	1	9.32	15	6	1.8	13	53000	100	.27	.54	0	87	13	12	0	30	trace	
25/9	2530	1.35	45	3.5	1/2	9		9.5	16	9.5	6	17	59000	20	.2	.45	2	85	13	15	30	42	"	
26/9	2535	1.36	45	3.25	1	9	1	9.37	18	8.5	5	15	61000	100	.25	.5	2	84	14	15	0	42	"	
27/9	2553	1.36	45	3.25	1	9	1	9.37	17	10	4	15	61000	100	.25	.5	2	84	14	15	0	42	"	
28/9	2571	1.36	46	3.25	1	9	1	9.3	16	9.5	5	16	59500	120	.2	.45	2	84	14	15	0	39	"	
29/9	2606	1.36	45	3.2	1	9	1	9.0	17	8	3.5	11	59000	50	.2	.45	2	84	14	15	0	39	"	
30/9	2624	1.36	46	3.2	1	9	1	8.85	17	9.5	4	14.5	59000	120	.2	.4	2	85	13	15	40	39.5	"	
1/10	2718	1.36	50	3.2	2	9	2	8.95	14	13.5	8	18.5	63000	180	.2	.45	2	83	15	"	20	40	"	
2/10	2750	1.36	48	5	2	12.5	2	9.0	15	10.5	7	1.8	57000	80	"	"	0	85	15	"	0	25	"	
3/10	2750	1.36	45	3	2	9.5	2	9.0	15	6	3	11	59000	80	"	"	1	84	"	"	0	"	"	
4/10	2750	<.36	45	3	2	9.5	2	9.0	15	6	3	11	59000	80	"	"	1	84	"	"	0	"	"	

**WELL NAME:** 30/6-9 Norsk Hydro

**MUD PROPERTY RECAP**

DATE	DEPTH feet metres	DENSITY PPG/ Spcl/ SG	VISC- OSITY secs	FILTRATE		HT/HP IIII		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS				CEC PPB Bent. Eq.	OTHER		
				ccs	Cake 12/100	°500psi			PV cp	YP lbs/100ft <sup>2</sup>	10" gms/100 cm <sup>2</sup>	10' mg/litre	Cl mg/litre	Ca ppm	PI	MI	Pm	Oil %	Water %	Corr. Solids %	PPB		Mg ppg	KCL ppb	sand %
						ccs	32/100																		
5/10	2750	1.36	45	3	2	9.5	2	8.85	15	5.5	3.5	12	57000	50	.2	.45	1	84	15	15	0	25	trace		
6/10	2750	1.36	45	3	2	9.5	2	8.71	12	5.5	4	13	55000	50	.2	.45	1	84	15	15	0	25	"		
7/10	2750	1.36	44	3	2	9.5	2	8.64	12	5.5	4	12	55000	50	.2	.4	1	84	15	15	0	25	"		
8/10	2751	1.25	48	9.5	2			9.0	20	17.5	2	15	8000	180	.1	.3	.2	0	90	10	20	40	0	0	
9/10	2751	1.28	54	6.5	1	12	2	13.42	17	5.3	2	18	6000	400	.42	.8	9	0	91	9	13	0	0	0	
10/10	2758	1.245	51	46	1	66	2	12.62	15	5	.47	4.5	5500	280	1.1	1.9	0	90	10	15	0	0	trace		
11/10	2796	1.24+	47	6	1	15	2	12.38	10	5	.47	.95	5000	200	1.3	2	0	90	10	15	0	0	"		
12/10	2903	1.25+	52	2.6	2	14	3	12.83	12	5	.47	2.0	5000	250	1.1	2	tr	89	11	16	0	0	"		
13/10	2975	1.25+	56	6.3	2	12.8	4	12.8	17	6.4	2	4	5000	200	1.0	1.8	tr	89	11	15	0	0	"		
14/10	3077	1.26	50	5.2	1	12.2	2	11.8	18	9	.95	3.5	5000	160	.75	1.5	tr	88	12	17	0	0	"		
15/10		1.24	78	6.4	1	13.4	2	11.9	17	5.3	.95	8.0	6000	300	.5	1.0	tr	89	11	16	0	0	"		
16/10	3224	1.24	54	6.4	1	13.6	2	11.78	13	5.3	.47	11	6600	440	.3	.8	tr	89	11	16	0	0	1/2		
17/10	3283	1.24	53	5.9	1	13.4	2	11.48	12	5.3	.97	9	7200	440	.16	.32	tr	90	10	16	0	0	trace		
18/10	3394	1.255	50	6	1	12	2	10.92	13	5.3	1.3	11	7500	520	.16	.4	tr	89	11	17	0	0	1/4		
19/10	3476	1.25	50	5.9	1	12	2	10.85	13	5.3	1.8	10	7500	520	.16	.43	tr	89	11	17	0	0	trace		
20/10	3476	1.25	42	6.3	1	12	2	10.69	10	5	.95	14	10000	720	.085	.15	tr	89	11	17	0	0	"		
21/10	3476	1.25	60	6.6	1	16.4	3	10.25	15	6.4	2.3	17	10000	520	1	.2	tr	89	11	17	0	0	"		
22/10	2738	1.25	50	7.0	1			10.9	14	5.3	2.3	18.5	10000	520	1	.2	tr	89	11	17	0	0	"		
23/10	2618	1.24	40	9.5	1			10.5	12	6	4	17	11000	800	.01	.15	tr	8	11	17	0	0	"		

106

**WELL NAME: 30/6-9 NORSK HYDRO**

**MUD PROPERTY RECAP**

DATE	DEPTH	DENSITY	VISCOSITY	FILTRATE		HY/HP IIII		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC			OTHER		
				ccs	Cake 1 1/2"/min	ccs	°500psi 1 1/2"/min		PV	YP	10'	10'	Cl	Ca	Pl	Ml	Pm	Oil	Water	Corr. Solids	PPB	Mg	KCL	Sand		
																									ppm	ppm
1982	metres	SG	secs	ccs	1 1/2"/min	ccs	°500psi 1 1/2"/min		cp				litre	ppm				%	%	%	Bent. Eq.	ppm	ppb	%		
24/10	2618	1.25	56	11.3	2	-	-	11.0	16	6.5	4	22	8000	520	.4	.8	4.0	0	89	11	17	0	0	Trace		
25/10	2618	1.24	58	11.5	2	-	-	11.1	18	7	5.5	26	8000	540	.4	.8	4.0	0	89	11	17	0	0	"		
26/10	2618	1.24	50	12.0	2	-	-	12	16	8	4	21.5	8500	650	.35	.7	-	Tr	89	11	17	0	0	"		
27/10	2618	1.24	48	13.2	2	-	-	11.0	15	6.5	4	23	9000	720	.4	.9	-	Tr	89	11	17	0	0	"		
28/10	2618	1.24	45	14.0	2	-	-	10.75	13	6.5	3	20	10000	720	.3	.7	-	Tr	89	11	17	0	0	"		
29/10	2618	1.24	43	16.2	2	-	-	10.0	10	4	3	10.5	11500	875	.15	.4	-	Tr	89	11	17	0	0	"		
30/10	2618	1.24	43	16.8	2	-	-	10.5	14	6	4	14	11500	875	.15	.4	-	Tr	89	11	17	0	0	"		
31/10	2607	1.24	42	17.1	3	-	-	10.6	14	5	3.5	12.5	11500	875	.15	.4	-	Tr	89	11	17	0	0	"		
1/11	2607	1.235	45	17.5	2	-	-	10.85	14	5	3	16.5	11000	875	.2	.45	-	Tr	89	11	17	0	0	"		
2/11	2607	1.235	45	17.8	2	-	-	11.0	13	6	2.5	18	11000	875	.2	.45	-	Tr	89	11	17	0	0	"		
3/11	2607	1.235	43	18.8	2	-	-	11.2	13	6	3	20	11500	875	.3	.55	-	Tr	89	11	17	0	0	"		
4/11	2607	1.235	43	18.8	2	-	-	10.8	12	4.5	3	14	11500	875	.2	.45	-	Tr	89	11	17	0	0	"		
5/11	2607	1.235	43	19.4	2	-	-	10.8	12	7	3	13.5	8500	600	.2	.5	-	Tr	89	11	17	0	0	"		
6/11	2607	1.24	45	18	3	-	-	10.64	10	5	1.4	13	7500	920	.2	.4	-	Tr	92	8	15	0	0	"		
7/11	2607	1.24	48	18	3	-	-	11.1	10	4.7	1.4	13	8000	800	.23	.5	-	Tr	91	9	14	0	0	"		
8/11	2607	1.23	40	20	3	-	-	11.14	7	5.7	1.4	10	8600	920	.13	.5	-	Tr	91	9	14	0	0	"		
9/11	2607	1.24	42	20	3	-	-	11.24	8	4.5	1.4		8400	840	.17	.42	-	Tr	90	10	14	0	0	"		
10/11	2607	1.24	43	20	3	-	-	10.9	8	5	1.4	9	10000	1200	.08	.3	-	Tr	90	10	14	0	0	"		
11/11	2607	1.24	43	20	3	-	-	10.95	8	4.8	1.4	8	9500	1100	.08	.34	-	Tr	90	10	13	0	0	"		





**WELL NAME:** Norsk Hydro 30/6-9

**MUD PROPERTY RECAP**

DATE	DEPTH	DENSITY	VISCOSITY	FILTRATE	HY/HP IIII		pH	RHEOLOGY				FILTRATE ANALYSIS					RETORT ANALYSIS			CEC	OTHER							
					feet	PPG/Spcl/SG		secs	ccs	Cake	°500pai	PV	YP	10"	10'	Cl	Ca	PI	MI		Pm	Oil	Water	Corr. Solids	PPB			
1/12	2549	1.23	43	NC	3		11.7	11	7.5	5	5	8500	740	.5	1.1	-	-	88	12	13	Trace							
2/12	2539	1.23	40	NC	3		11.7	11	7.5	5	5	8500	740	.5	1.1	-	-	88	12	13	"							
3/12	2539	1.23	40	NC	3		11.6	9	4.5	4		8500	740	.5	1.1	-	-	92	8	13	"							
4/12	2539	1.23	48	NC	3		11.58	8	5	4	6	8700	800	.54	.9	-	-	92	8	12	"							
5/12	2539	1.245	52	NC	6		11.6	11	8	6		7000	760	.68	.9	-	-	91	9	14	"							
6/12	2539	1.24	50	NC	5		11.4	7	5.5	3	4	7300	820	.71	1.1	-	-	90	10	13	"							
7/12	2539	1.24	52	NC	5		11.2	9	8.3	7	8	7300	880	.89	1.2	-	-	91	9	14	"							
8/12	2539	1.24	50	NC	6		11.4	8	7	6	6	7700	820	.87	1.4	-	-	91	9	14	"							
9/12	2539	1.24	45	NC	6		10.8	8	6.4	4	7	7200	760	.68	1.1	-	-	91	9	12	"							
10/12	2539	1.25	42	NC	6		10.6	7	5.5	2.3		6600	680	.15	.4	-	-	91	9	12	"							
11/12	2463	1.24	45	NC	6		11	9	7.3	5.4	6	7300	680	.8	1.3	-	-	91	9	13	"							
12/12	2463	1.24	47	NC	6		11.2	8	7.6	6	8	6900	640	.89	1.3	-	-	91	9	13	"							
13/12	2463	1.23	48	NC	6		11.3	8	7	6	8	7800	680	.75	1.3	-	-	92	8	13	"							
14/12	2463	1.25	48	NC	6		11.3	9	7	6	7	6950	720	.87	1.1	-	-	90	10	13	"							