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HYDRO

FORMATION PRESSURE WORKSHEET

Well No. : 30/9-10

Rig : Vildkat

Date : 21. 08. 90

Pressure Units : Bar

RKB-MSL : 25 m

Witnessed by : Solhjem/Skjold

Run No.	Depth (MD)	Depth TVD (RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks Mobility Est. mD/cp
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
2A / 1	2762.5	2760.7	341.3	341.8	292.95	293.3	341.3	341.7	10:35	10:43	21.3
2	2772	2770.2	342.5	342.9	293.57	293.7	342.5	342.7	10:46	10:55	118.2 HP sl.unstable
3	2774.5	2771.7	342.8	343.0	293.72	293.8	342.8	342.9	10:58	11:04	40.2
4	2782	2780.2	343.7	343.8	294.26	294.2	343.7	342.8	11:07	11:14	214.0
5	2786	2784.2	344.3	344.4	294.64	294.8	344.2	344.4	11:16	11:23	Low mobility
6	2791	2789.2	344.9	345.1	294.94	295.1	344.8	345.1	11:26	11:33	28.0
7	2795.5	2793.7	345.4	345.6	295.31	295.4	345.4	345.6	11:36	11:43	10.5
8	2799.5	2797.7	345.9	346.0	295.44	295.5	345.9	346.1	11:46	11:53	132.5
9	2802.5	2800.7	346.3	346.5	295.66	295.8	346.3	346.5	11:55	12:02	26.3
10	2806.5	2804.7	346.8	347.1	295.90	295.9	346.8	346.8	12:04	12:12	HP decreasing
11	2809.5	2807.7	347.2	347.5	296.14	296.3	347.2	347.5	12:15	12:20	60.8
12	2811.5	2809.7	347.4	347.6	296.33	296.5	347.4	347.6	12:23	12:28	Low mobility
13	2816.5	2814.7	348.0	348.3	296.63	296.8	348.0	348.3	12:32	12:37	28.1
14	2822	2820.2	348.7	349.0	296.98	297.1	348.7	349.0	12:40	12: 45	128.0 Segr. sample

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Run No.	Depth (MD)	Depth TVD (RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks Mobility Est. mD/cp
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
2A / 15	2824	2822.2	348.9	349.1	297.13	297.3	348.9	349.1	12:50	12:53	42.8
16	2831.5	2829.5	349.8	350.0	-	-	-	-	13:01	13:02	Tight
17	2831.3	2829.7	349.8	350.0	-	-	-	-	13:07	13:08	Tight
18	2835	2833.2	350.2	-	-	-	-	-	13:21	13:22	Tight, HP failure
19	2854	2852.2	352.7	-	299.80	-	352.6	-	13:35	13:38	159.5
20	2856	2854.2	352.8	-	300.01	-	352.8	-	13:47	13:49	735.9
21	2857.5	2855.7	353.0	-	300.14	-	353.0	-	13:55	13:56	171.4
22	2868	2866.2	354.3	-	301.36	-	354.3	-	14:03	14:06	28.7

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FORMATION PRESSURE WORKSHEET

Well No. : 30/9-10

Rig : Vildkat

Date : 25.08.90

Pressure Units : Bar

RKB-MSL : 25 m

Witnessed by : Solhjem/Skjold

Run No.	Depth (MD)	Depth TVD (RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
3B / 1	2757.5	2755.7	345.20	345.47	292.60	292.77	345.20	345.46	16:20	16:40	7.15
2	2775	2773.2	347.37	347.67	293.67	293.88	347.40	347.69	16:48	17:40	Segregated sample
3	2791	2789.2	349.37	349.78	294.85	295.10	349.37	349.73	17:45	17:52	31.7
4	2806.5	2804.7	351.22	351.58	295.85	296.03	351.24	351.58	17:56	18:08	Low mobility
5	2824	2822.2	353.46	354.01	297.07	297.42	353.46	353.84	18:14	18:23	HP unstable
6	2854	2852.2	357.12	357.86	299.73	300.22	357.14	357.73	18:28	18:35	169.0
7	2856	2854.2	357.40	357.93	299.93	300.21	357.38	357.78	18:39	18:45	237.0
8	2857.5	2855.7	357.56	357.97	300.07	300.24	357.57	357.89	18:48	18:56	162.5
9	2895.5	2893.7	362.25	362.72	305.39	305.68	362.25	362.66	19:00	19:20	356.5
10	2928.5	2926.7	366.28	366.88	309.14	309.33	366.30	366.60	19:27	19:39	33.3
11	2942	2940.2	367.95	368.26	310.46	310.59	367.93	368.26	19:53	20:00	106.7
12	2951	2949.2	369.05	369.48	311.35	311.61	369.05	369.48	20:04	20:11	197.7
13	2981.2	2979.3	372.76	373.47	314.57	315.08	372.77	373.30	20:18	20:27	4.0
14	3004	3002.1	375.58	376.30	316.92	317.26	375.58	376.03	20:33	20:42	76.4

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FORMATION PRESSURE WORKSHEET

Well No. : 30/9-10

Rig : Vildkat

Date : 25.08.90

Pressure Units : Bar

RKB-MSL : 25m

Witnessed by : Solhjem/Skjold

Run No.	Depth (MD)	Depth TVD (RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
3B / 15	3026	3024.1	378.32	378.93	320.32	320.67	378.34	378.78	20:47	20:55	619.1
16	3045.5	3043.6	380.73	381.45	322.99	323.35	380.74	381.25	21:00	21:06	203.8
17	3052.5	3050.6	381.62	382.28	323.68	324.04	381.62	382.06	21:12	21:18	119.1
18	3060	3058.1	382.55	383.05	324.41	324.69	382.55	382.99	21:23	21:30	203.3
19	3076	3074.1	384.54	385.13	326.00	326.36	384.56	385.07	21:38	21:44	196.7
20	3082	3080.1	385.30	385.89	326.58	326.95	385.31	385.81	21:48	21:57	277.7
21	3097.5	3095.6	387.20	387.80	328.26	328.58	387.24	387.72	22:01	22:07	90.5
22	3103	3101.1	387.91	388.30	328.76	329.01	387.91	388.30	22:09	22:26	4.7 Hp needed 10min
											to stabilize
											Tight hole at 3120-25m

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FORMATION PRESSURE WORKSHEET

Well No. : 30/9-10

Rig : Vildkat

Date : 26.08.90

Pressure Units : Bar

RKB-MSL : 25m

Witnessed by : Solhjem

Run No.	Depth (MD)	Depth TVD (RKB)	Initial Hydrostatic Press		Formation Pressure		Final Hydrostatic Press		Time		Remarks
			Strain	HP	Strain	HP	Strain	HP	Set	Retract	
3C / 1	3622.0	3614.7	448.20	448.56	-	-	-	-	17.05	17.07	Seal failure
2	3622.2	3614.9	448.24	448.89	-	-	-	-	17.13	17.14	Seal failure
3	3623.9	3616.5	448.42	449.15	435.09	435.84	448.43	449.24	17.21	17.24	Low drawdown mobility
4	3632.5	3624.9	449.45	450.65	435.49	436.35	449.45	450.35	17.32	17.37	Low drawdown mobility
5	3633.0	3625.4	449.52	450.30	435.38	436.08	449.50	450.31	17.45	17.49	2.2
6	3633.5	3625.9	449.56	450.32	435.52	436.38	449.55	450.49	17.56	18.01	0.9
7	3634.0	3626.4	449.63	450.34	435.63	436.55	449.60	450.55	18.08	18.13	Low drawdown mobility

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FORMATION FLUID SAMPLING

Well : 30/9-10

Rig : VILDKAT

Pretest No. : 14		Sample Depth : 2822m		Witnesses : Solhjem/Skjold	
Run No.: 2A	Sample No. : 1	1st Chamber	2nd Chamber	3rd Chamber	
Chamber volume (gals/litres)		2 3/4 Gal	1 Gal		
Chamber No.		-	RFS AD 1236		
Filling time (mins.)		15 min	5 min		
Shut in press. (bar)/T deg C		297.1 Bar/95.9	297.1 Bar/95.9	/	
Chamber press. (surf bar)/T		110 / 15	- / -	/	
Gas volume (cu ft)		114			
Oil volume (litres)		3.75			
Oil gravity (API)		29			
Water / Filtrate (litres)		5.50			
Water / Filtrate PPM CL-		45,000			
Water filtrate pH/pF/Ca++		6.8/ 0 / 800	/ /	/ /	
Mud filtrate PPM CL-		57,000			
Mud filtrate pH/pF/Ca++		9.3/ 0.05/ 200	/ /	/ /	
Gas composition % C1		85			
C2		5			
C3		2			
IC4		0.3			
NC4		0.2			
H2S		0			
CO2		Not analysed			

Remarks :

2nd Chamber (1 Gal sample) sealed and dispatched to Bergen, 22.08.90

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FORMATION FLUID SAMPLING

Well : 30/9-10

Rig : Vildkat

Pretest No. : 2		Sample Depth : 2775m		Witnesses : Solhjem/Skjold	
Run No.: 3B	Sample No. : 1	1st Chamber	2nd Chamber	3rd Chamber	
Chamber volume (gals/litres)		2 3/4 gal	1 gal		
Chamber No.			1225-RFS-AD		
Filling time (mins.)		20	20		
Shut in press. (bar)/T deg C		292.6 / 98.1	293.25 / 98.4	/	
Chamber press. (surf bar)/T		95 / 15	/	/	
Gas volume (SCF/Sm3)		6.5 ScF			
Oil volume (litres)		2.8			
Oil gravity (API/gm/cc)		31 API			
Water / Filtrate (litres)		7.0			
Water / Filtrate PPM CL-		46,000			
Water filtrate pH/pF/Ca++		6.7 / 0 / 1000	/ /	/ /	
Mud filtrate PPM CL-		58,000			
Mud filtrate pH/pF/Ca++		8.3 / 0.1 / 180	/ /	/ /	
Gas composition % C1		87.0			
C2		7.5			
C3		4.1			
IC4		0.6			
NC4		0.7			
C5		0.03			
H2S		-			

Remarks :

Initially no flow pressure while sampling 2 3/4 gal chamber
General flow pressure 2 3/4 gal: 200-205 bar
" " " 1 gal: 210 bar



WELL TEST RESULT

WELL: 30/9-10

TEST NO.	1A	1B	
PERFORATED INTERVAL	2757.0-2776.0m MD RKB	2757.0-2776.0m MD RKB 2779.7-2824.7m MD RKB	
CHOKE SIZE (mm)	15.9	19.1	
OIL/COND. FLOW RATE /Sm ³ /D)	379	986	
GAS FLOW RATE (Sm ³ /D)	42100	84800	
GOR (Sm ³ /Sm ³)	111	86	
OIL/COND. GRAVITY (g/cc) @ 15°C	0.861	0.861	
GAS GRAVITY (air=1)	0.754	0.754	
FWHP (bar)	43.6	80.8	
SIWHP(bar)	95.9	101.9	
WHT (deg C)	47.1	68.5	
BHT (deg C)	107.0	108.4	
BHFP (bar)	177.5	255.2	
BHSIP (bar)	285.7	285.7	
BS&W (%)	0	0	
CO2 (%) (Max)	0.8	0.6	
H2S (ppm) (Max)	0	0	
K (mD)	23	67	
S	-1.3	-0.8	
Pi (bar)	285.7	285.7	
DEPTH OF BH MEASUREMENTS	2666.6m MD RKB	2666.6m MD RKB	

Daily mud properties

Date: 20/2-1991

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System : BORE

Norsk
Hydro

Well: 30/9-10
Mud Contractor: NL-BAROID
Data: "Mid depth" from table 3, otherwise from table 14.

14.

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Table B-10 Daily Mud Properties

Date	Mid. depth m, MD	Mud Dens. (SG)	PV cp	YP Pa	GEL 0 Pa	GEL 10 Pa	pH	100 psi (cc)	HP/HT (cc)	Cl-inn/out mg/l	Alkalinity			Ca++ inn/out mg/l	Oil %	Sol %	H2O %	V.G 600 rpm	meter 300 rpm	at 200 rpm	115 100 rpm	15 6 rpm	gr. 3 rpm	F 3 rpm	Mud Type	
											Pf	Pm	Mf													
900730	124	1.05	0	0																					SPUD	
900731	210	1.05	0	0																						SPUD
900801	224	1.05	0	0																						SPUD
900802	483	1.05	0	0																						SPUD
900803	1059	1.05	0	0																						SPUD
900804	1059	1.05	0	0																						SPUD
900805	1132	1.20	10	8	1	1	8.6	2.5	14.0	54000/54000	0.20	0.20	0.90	40/40		5		36	26	16	10	1	1	1	KCL	
900806	1392	1.40	28	9	2	2	8.3	2.2	8.8	55000/55000		0.10	0.50	30/30		13		73	45	36	24	5	3	3	KCL	
900807	1711	1.40	23	8	2	3	8.4	2.2	8.0	63000/63000	0.10	0.10	0.70	200/200		14		62	39	28	17	3	2	2	KCL	
900808	1984	1.40	29	9	2	3	8.2	2.5	8.0	62000/62000			0.80	230/230		18		75	46	35	22	3	3	3	KCL	
900809	2306	1.41	29	9	1	2	8.2	2.1	7.4	63000/63000	0.10	0.20	1.00	180/180		15		65	36	27	15	3	2	2	KCL	
900810	2465	1.40	26	12	3	7	8.1	3.0	8.0	53000/53000			0.70	150/150		16		75	49	40	26	7	6	6	KCL	
900811	2716	1.42	25	9	3	10	8.0	3.0	7.0	50000/50000	0.05	0.05	0.70	120/120		16		68	43	51	15	7	6	6	KCL	
900812	2716	1.42	25	9	2	9	8.0	3.1	7.2	50000/50000	0.10	0.10	0.70	120/120		16		67	42	35	15	7	6	6	KCL	
900813	2716	1.42	20	11	3	8	8.0	2.8	7.0	50000/50000	0.20	0.20	1.10	140/140		16		61	41	32	20	5	4	4	KCL	
900814	2725	1.27	15	9	2	3	11.0	3.4	9.0	62000/62000	0.30	1.30	1.00	160/160		12		47	32	26	17	3	2	2	KCL	
900815	2730	1.27	16	8	2	3	10.4	2.1	7.4	56000/56000	0.50	1.20	1.50	160/160		12		48	32	27	18	4	3	4	KCL	
900816	2747	1.28	17	8	2	3	10.3	2.7	7.5	55000/55000	0.30	1.00	0.90	120/120		12		50	33	28	19	5	4	4	KCL	
900817	2774	1.28	16	8	2	2	10.0	2.8	7.7	56000/56000	0.40	0.70	1.00	80/80	0	12	88	48	32	26	18	5	3	3	KCL	
900818	2825	1.28	22	8	2	2	9.8	3.0	7.8	55000/55000	0.20	0.60	0.90	80/80	0	12	88	60	38	30	20	3	3	3	KCL	
900819	2873	1.27	19	7	1	2	9.2	2.8	7.7	57000/57000	0.10	0.60	0.70	340/340	0	12	88	52	33	26	17	3	2	2	KCL	
900820	2895	1.90	19	1	1	2	9.2	2.4	7.5	57000/57000	0.10	0.50	0.60	180/180	0	12	88	52	33	26	17	3	2	2	KCL	
900821	2895	1.26	19	7	1	2	9.2	2.4	7.5	57000/57000	0.10	0.50	0.60	180/180	0	12	88	52	33	26	17	3	2	2	KCL	
900822	3258	1.27	18	7	1	2	9.0	2.4	8.2	57000/57000	0.10	0.10	0.60	280/280	0	12	88	49	31	24	15	3	2	2	KCL	
900823	3588	1.27	22	10	2	3	8.2	2.4	8.3	58000/58000	0.10	0.10	0.70	160/160	0	13	87	54	32	28	18	4	3	3	KCL	
900824	3649	1.27	23	8	2	4	8.2	2.4	8.6	58000/58000	0.10	0.10	0.70	120/120	0	13	87	61	38	30	19	4	3	3	KCL	
900825	3649	1.27	14	6	1	2	8.2	2.4	8.8	58000/58000	0.10	0.10	0.70	180/180	0	13	87	40	26	19	8	3	2	2	KCL	
900826	3649	1.27	21	9	2	5	8.2	2.8	9.0	57000/57000	0.10		0.70	280/280	0	13	87	60	39	30	20	4	3	3	KCL	
900827	3649	1.27	20	8	2	4	8.2	2.8	9.0	57000/57000	0.10		0.70	280/280	0	13	87	55	35	26	18	3	2	2	KCL	
900828	3649	1.27	20	7	1	2	8.2	2.8	8.9	57000/57000	0.10		0.70	280/280	0	13	87	54	34	25	17	3	2	2	KCL	
900829	3002	1.22	11	5	0	2	11.0	2.6	8.9	47000/47000	0.20	1.20	0.80		0	10	90	32	21	16	10	3	1	1	KCL	
900830	3002	1.22	13	5	1	3	11.2	2.6	8.8	52000/52000	0.20	1.60	0.80		0	10	90	36	23	18	12	3	2	2	KCL	
900831	3002	1.22	13	5	1	2	11.2	2.8	8.9	52000/52000	0.20	1.60	0.80	60/60	0	10	90	36	23	18	12	3	2	2	KCL	
900901	3002	1.22	17	10	2	5	11.4	2.9		52000/52000	0.30	1.80	0.80	160/160	0	10	90	53	36	28	19	5	3	3	KCL	
900902	3002	1.22	18	11	2	5	11.4	2.9		52000/52000	0.30	1.80	0.80	180/180	0	10	90	58	40	32	22	6	4	4	KCL	
900903	3002	1.22	18	11	2	5	11.4	3.0		52000/52000	0.30	1.80	0.80	180/180	0	10	90	58	40	31	22	6	4	4	KCL	
900904	3002	1.22	19	11	2	5	11.3	3.0		52000/52000	0.30	1.80	0.80	180/180	0	10	90	63	41	30	21	6	4	4	KCL	
900905	3002	1.22	22	10	2	5	11.3	3.0		52000/52000	0.30	1.80	0.80	80/80	0	10	90	63	41	31	21	6	4	4	KCL	
900906	3002	1.22	22	10	2	5	11.0	3.0		52000/52000	0.30	1.80	0.80	180/180	0	10	90	63	41	30	21	6	4	4	KCL	
900907	3002	1.15	11	12	2	3	10.6	3.3		37000/37000	0.10	0.40	1.00	300/300	0	8	92	47	36	29	21	6	4	4	KCL	
900908	3002	1.15	11	13	2	3	10.6	3.3		37000/37000	0.10	0.40	0.90	300/300	0	8	92	47	36	29	21	6	4	4	KCL	
900909	3002	1.15	11	13	3	3	10.6	3.3		37000/37000	0.10	0.40	0.90	300/300	0	8	92	47	36	29	21	6	4	4	KCL	
900910	3002	1.15	11	13	3	3	10.6	3.3		37000/37000	0.10	0.40	1.00	300/300	0	8	92	47	36	29	21	6	4	4	KCL	
900911	3002	1.15	11	13	3	3	11.6	3.3		37000/37000	0.10	0.40	1.00	300/300	0	8	92	47	36	29	21	6	4	4	KCL	

Daily mud properties

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System : BORE

Well: 30/9-10

Mud Contractor: NL-BAROID

Data: "Mid depth" from table 3, otherwise from table 14.

14.

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Norsk
Hydro

Date	Mid. depth m, MD	Mud Dens. (SG)	PV cp	YP Pa	GEL 0 Pa	GEL 10 Pa	pH	100 psi (cc)	HP/HT (cc)	Cl- inn/out mg/l	Alkalinity			Ca++ inn/out mg/l	Oil %	Sol %	H2O %	V.G 600 rpm	meter at 115 gr. F					Mud Type
											Pf	Pm	Mf						300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	
900912	3002	1.15	11	13	3	3	11.4	3.3		36000/36000	0.10	0.40	1.00	300/300	0	8	92	47	36	29	21	6	4	KCL
900913	3002	1.15	11	13	3	3	11.6	3.3		37000/37000	0.10	0.40	1.00	300/300	0	8	92	47	36	29	20	6	4	KCL
900914	3002	1.15	11	13	3	3	11.6	3.3		36000/36000	0.10	0.40	1.00	330/330	0	8	92	47	36	29	20	6	4	KCL
900915	3002	1.15	11	13	3	3	11.6	3.3		36000/36000	0.10	0.40	1.00	380/380	0	8	92	47	36	29	20	6	4	KCL
900916	3002	1.15	11	10	3	4	10.0	3.3		39000/39000	0.10	0.10	0.60	330/330	0	8	92	42	31	26	18	6	4	KCL
900917	3002	1.16	11	10	3	4	9.3	3.4		39000/39000	0.10	0.10	0.60	320/320	2	9	89	42	31	26	20	7	5	KCL
900918	350	1.16	11	10	3	4	10.2				0.10	0.10	0.70		3	9	88	42	31	26	20	7	5	KCL

Table B-11 Mud Material Consumptions

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((((ooo)	M u d c o n s u m p t i o n ----- System : BORE	Date 11/2-1991
Norsk Hydro	Well: 30/9-10 Mud company: NL-BAROID	13
		Actual used

Drilling of 36 " hole		

BARITE	Kg	10000
BENTONITE	Kg	21000
CAUSTIC SODA	Kg	225
SODA ASH	Kg	175
Drilling of 17 1/2" hole		

BARITE	Kg	42000
BENTONITE	Kg	23000
CAUSTIC SODA	Kg	950
SODA ASH	Kg	950
Drilling of 12 1/4" hole		

BARASCAV-D	Kg	650
BARITE	Kg	377000
BICARBONATE	Kg	190
DEXTRID	Kg	17233
EZ MUD	Kg	2528
KCL	Kg	12000
KOH	Kg	1550
PAC L	Kg	2750
PAC R	Kg	1119
SODA ASH	Kg	525
XCD POLYMER	Kg	2400
KCL-BRINE	l	407000
Drilling of 8 1/2" hole		

BARASCAV-D	Kg	250
BARITE	Kg	33000
BICARBONATE	Kg	1060
CAUSTIC SODA	Kg	25
DEXTRID	Kg	4200
EZ MUD	Kg	570
KCL	Kg	4000
KOH	Kg	150
PAC L	Kg	1100
PAC R	Kg	1025
SODA ASH	Kg	375
XCD POLYMER	Kg	175
KCL-BRINE	l	103000
Test no. 1		

BARITE	Kg	5000
BICARBONATE	Kg	300
XCD POLYMER	Kg	925
KCL-BRINE	l	21000

((((ooo) ----- Norsk Hydro	M u d c o n s u m p t i o n ----- System : BORE	Date 11/2-1991
	Well: 30/9-10 Mud company: NL-BAROID	13

Actual used

Plug and Abandon

BARASCAV D	Kg	250
BARITE	Kg	18000
XCD POLYMER	Kg	25
BARACOR 100	l	1665