

6.4 Mud report

36" hole section, 30" casing

The hole was drilled to 196 m, using seawater with returns to seabed. 5 m³ high viscosity pills were pumped on each connection. Before running 30" casing, 30 m³ high viscosity mud was spotted in the well. The 30" casing was run and cemented without any problems.

Materials used in this section:

Bentonite, Caustic Soda and Bicarbonat of Soda.

26" hole section, 20" casing

The riser was run before the 17 1/2" pilot hole was drilled. The shoe was drilled out with sea water, from 184 m to 196 m. In the start of this section, mud was lost over the shakers. Tight hole problems appeared from 498 m to 665 m, TD. The hole was reamed with seawater and high viscosity pills were spotted on each 3rd connection. The hole was displaced to high viscosity mud before the casing was run and cemented without any problems.

The mud used in this section contained:

Bentonite, Barite, Caustic Soda, Lime, Milol. 351R and XC-polymer.

17 1/2" hole section, 13 3/8" casing

The hole was drilled to 2750 m, with Shale Trol mud system.

This system contained:

Bentonite, Barite, Milpol. 302, Milpol. 351L, Milpol. 351R, Shaletrol 202, Caustic Soda and Soda Ash.

At 2000 m the mud weight was increased to 1,2. This mud weight was used during the rest of this section.

Because of tight hole problems, it was necessary to ream, wash and to wiper trip quite frequently. It was also necessary to flush the flowline due to gumbo plugging the line. Mud detergent was used to reduce drag/torque and to avoid bit balling problems. Around 2750 m, serious viscosity problems were encountered (ref. report 109:15/2-1:09). The Funnel Viscosity increased to 300 + sec./qt.

High viscosity mud was spotted before logging and the casing was thereafter run and cemented.

12 1/4" hole section, 9 5/8" casing

12 1/4" hole was drilled from 2750 m to 3786 m and the mud system was converted from a polymer system to a dispersed system, by adding lignosulfonate.

Materials used in this section:

Barite, Bentonite, Caustic Soda, Sodium Bicarbonate, Unical, Ligcon and Drispac R., Chemtrol X, Mil Mica X, Mil Mica M, Milplug M and LD-8 were also added because of hole problems.

In this section the mud weight was raised from 1,2 rd to 1,5 rd. The hole was turbine drilled from 2739 m to 3372 m with no apparent problems. However, because of the experienced hole problems after turbine drilling, reaming and washing was necessary. No problems appeared during logging and running casing.

8 3/8" hole section

This hole was drilled 3770 m to 4365 m, using the same system as in 12 1/4" hole section. LD-8 was spotted to reduce torque in the beginning of this section. Walnut F, Mil Mica F, Mil Mica M and Drispac R were used in the end of this section to reduce water loss. Down to 4000 m mud weight was increased to 1,9. This mud weight was used during the rest of this section. Some drilling problems were encountered: The drillpipe became temporarily stuck at 4234 m and tight hole was experienced from 4335 m to TD. The hole was reamed and washed before logging at TD (4600 m). The well was thereafter abandoned.

DAILY MUD PROPERTIES

DATE	DEPTH	SP.GR. WT.	VIS SEC.	CORR. 115°F		GELS		PH BLACK STRIP	FLUID LOSS		CL CACL NACL MG/L	ALKALINITY			CA PPM	RETORT			BBL CEC
				PV	YP	PASCALS 0 10	100PSI API		500PSI 300°F HP HP	PF		PM	MF	% OIL		% SOL	% WATER		
23.11		1,04		12	34	18	43	10,5											
24.11		1,04		17	46	20	48	10,3											
25.11		1,04		13	29	18	39	10,2											
26.11		No mud	check mixing new mud.																
27.11	386	1,08		4	2	1	1	8,8											
28.11	665	1,04		14	27	13	21	8,8											
29.11	587	1,20		4	8	2	3	8,8											
30.11	665	1,04		5	7	2	4	7,4											
01.12		Mixing new mud																	
		End of 20" Section																	
02.12	665	1,04		12	17	3	6	10,5	16,2		11000	,47		1,08	160				
03.12	653	1,04		11	15	3	5	10,5	16,8		11000	,52		1,1	160				
04.12	1168	1,11		12	14	5	8	10	14,2		14000	,21		,75	160	0	7	93	
05.12	1438	1,13		20	23	11	38	9,3	9,4		16300	,15		,95	180	3	9	88	
06.12	1700	1,13		11	15	6	20	10,2	11,6		16000	,30		,85	120	3	6	91	
07.12	1900	1,13		13	20	8	24	9,8	11,2		15000	,27		,77	180		10	90	17,5
08.12	2093	1,13		9	21	7	33	10	14,2		16500	,17		,60	220	1	8	91	14,5
09.12	2120	1,20		12	26	8	22	10,5	12,6		16500	,4		1,0	200		11	89	15
10.12	2270	1,21		14	25	7	18	10	10,6		17000	,22		,80	280		12	88	17,5
11.12	2344	1,20		13	22	6	21	10,5	11		16000	,2		,1	260		12	88	16,5
12.12	2458	1,20		16	24	10	27	10,5	10,2		16450	,4		,1	220	0	13	87	16,5
13.12	2550	1,20		14	22	8	22	10,3	11,4		17000	,4		,9	250	0	11	89	16,1
14.12	2660	1,20		14	23	9	25	10,5	11		17400	,4		,1	260	0	11	89	16
15.12	2692	1,20		14	22	9	22	10,5	11,2		17500	,4		,1	260	0	11	89	16
16.12	2737	1,20		15	22	8	18	10,5	11,4		17600	,4		1,3	200	0	10,5	89,5	16
17.12	2750	1,20		15	22	8	18	10,5	11,1		17600	,4		1,0	240	0	10	90	16
18.12	2750	1,21		18	41	18	46	10,2	10,8		17000	,42		,97	280	0	11,5	88,5	17,5
19.12	2750	1,21		19	44	19	49	10,2	11,0		17500	,39		,95	280	0	11	89	17,5

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DATE	DEPTH	SP.GR. WT.	VIS SEC.	CORR. 115°F		GELS		PH BLACK STRIP	FLUID LOSS		CL CACL NACL MG/L	ALKALINITY			CA PPM	RETORT			BBL CEC
				PV	YP	PASCALS 0 10			100PSI API	500PSI 300°F HF HP		PF	PM	MF		% OIL	% SOL	% WATER	
20.12	2750	1.20		18	39	7	44	10.1	11.4		17000	.37		.91	260	0	11	89	16
21.12	2750	1.21		17	19	11	32	10	11.6		17500	.34		.86	280	0	10.5	89.5	16
22.12	2750	1.20		17	12	8	25	10	12		18000	.32		.91	250	0	10	90	15
		END OF 17 1/2" SECTION																	
23.12	2625	1.23		19	20	10	41	11.2	14.6		18000	.71		.36	420	0	11	89	15
24.12	2758	1.22		15	10	2	11	11.6	16.2		18000	1.21		3.25	460	0	11	89	17.5
25.12	2764	1.22		22	18	4	14	11.9	19.6		18500	2.78		4.08	600	0	12	88	20
26.12	2712	1.20		18	11	2	11	11.8	19.0		18500	2.57		3.96	680	0	11	89	22.5
27.12	2793	1.22		18	12	2	11	11.7	13.6		18700	2.42		3.87	560	1.5	12.5	86	25
28.12	2860	1.22		19	11	2	10	11.7	11.5	23.8	18300	1.6		3.1	440	2	12	86	27.5
29.12	2960	1.24		19	12	2	7	11.4	10.7	24.4	18700	1.4		2.3	400	2	13	85	27.5
30.12	3037	1.24		20	16	2	10	11.1	10.2	22.6	18500	.8		1.64	420	2	13	85	27.5
31.12	3100	1.25		21	16	2	9	11.1	10.4	24.8	18700	.7		1.73	440	2	13.5	84.5	27.5
01.01	3185	1.25		19	12	2	8	10.9	10	25.2	19000	.7		1.47	480	1.5	13	85.5	27.5
02.01	3257	1.25		18	15	2	9	10.6	10.2	25	18500	.62		1.45	450	1.5	13	85.5	27.5
03.01	3333	1.25		18	15	2	11	10.6	9.8	24.3	18400	.5		1.6	420	1.5	13	85.5	85.5
04.01	3357	1.25		18	16	2	9	10.4	9.9	24.7	18500	.5		1.3	410	1	13	86	27.5
05.01	3372	1.25		17	15	2	11	10.4	10.4	24.5	18500	.45		1.0	410	1	13	86	26.5
06.01	3423	1.25		17	15	2	9	10.3	9.8	25	18500	.5		1.1	340	1	13	86	26
07.01	3515	1.30		16	16	3	9	10.1	10	24.3	18500	.43		1.0	310	0	14	86	26
08.01	3587	1.30		19	18	2	10	10.2	9.3	24.0	18500	.4		1.0	320	0	14	86	26
09.01	3653	1.43		21	18	2	12	10.1	9.3	24.6	18400	.5		1.2	305	0	16	84	25
10.01	3725	1.44		21	19	2	12	9.8	9.3	24.5	18500	.5		1.2	300	0	17	83	25
11.01	3786	1.44		22	19	3	14	9.7	8.6		18500	.4		1.0	300	0	17	83	24.5
12.01	3786	1.48		22	18	3	13	9.5	9	25	18500	.4		.95	370	0	17	83	26
13.01	3786	1.48		22	20	3	15	9.6	9	24	18500	.45		1.0	360	0	17	83	25
14.01	3786	1.49		23	20	3	15	9.2	9.4	25.3	18.500	.45		.95	370	0	17	83	26

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DATE	DEPTH	SP.GR. WT.	VIS	CORR. 115°F		GELS		PH	FLUID LOSS		CL CACL NACL MG/L	ALKALINITY			CA PPM	RETORT			BBL		
			SEC.	PV	YP	0	10	BLACK STRIP	100PSI API	500PSI 300°F HP HP		PF	PM	MF		% OIL	% SOL	% WATER	CEC		
15.01	3786	1.49		30	40	12	42	8.8	10.6	29.4	19000	12		1.01	440	0	18	82	30		
16.01	3770	1.51		35	41	15	51	8.8	11.4		19000	14		0.98	420	TR	18.5	81.5	32.5		
				END OF 12 1/4" HOLE SECTION																	
17.01	3786	1.51		27	20	8	39	8.8	11.8		18700	18		1.06	440	0	18	82	32.5		
18.01	3790	1.48		19	8	3	12	10.3	12.2		1900	52	1.04	1.62	510	1	18	81	32.5		
19.01	3794	1.60		35	10	3	21	10.8	9.6		18500	90	2.02	1.94	560	1	23	76	37.5		
20.01	3809	1.75		40	12	4	18	10.6	8.4	28.4	18700	63	1.23	1.54	510	TR	29	71	40.0		
21.01	3889	1.76		49	30	5	22	10.5	7.0	22.6	19200	51	1.01	1.64	490	TR	30	70	37.5		
22.01	3945	1.85		50	25	6	18	10.6	6.3	18.2	19000	62	0.94	1.91	410	0.5	33	66.5	40		
23.01	4001	1.85		46	18	5	15	10.6	6.0	16.4	19200	66	1.26	2.02	440	1.5	30	68.5	35		
24.01	4007	1.85		47	19	5	17	10.5	6.2	16.8	19000	56	1.73	1.72	460	1.5	30	68.5	35		
25.01	4039	1.85		45	22	5	21	10.5	5.8	14.4	18700	62	1.61	1.94	480	1	31	68	32.5		
26.01	4073	1.85		44	20	5	18	10.7	5.6	14.0	19000	76	2.07	2.12	460	1	30.5	68.5	30		
27.01	4085	1.86		39	14	4	12	10.7	5.8	14.8	19200	72	1.97	2.06	440	1	29	70	27.5		
28.01	4130	1.86		45	22	5	15	10.6	5.4	14.2	19000	63	1.84	1.98	420	1	30.5	68.5	30		
29.01	4174	1.89		46	24	4	16	10.6	5.5	14.3	19000	55	1.85	1.87	420	1	32	67	29.5		
30.01	4244	1.90		47	11.5	2.5	8.5	10.3	4.7	13.9	19000	56	1.79	1.76	385	1	32	67	29		
31.01	4306	1.89		46	12	2	9	10.3	4.7	13.6	19000	5	1.75	1.6	385	1	32	67	28.5		
01.02	4364	1.89		40	11	2	11	10.5	4.8	13.9	19000	65	1.65	1.9	295	1	31	68	27.5		
02.02	4364	1.89		41	11	2	10	10.5	4.8	13.9	19000	60	1.60	1.7	295	1	31	68	27		
03.02	4371	1.89		42	12	2	10	10.4	5.0	14.2	19000	55	1.60	1.6	305	1	32	67	27		
04.02	4390	1.89		44	12	2	9	10.3	5.1	14.3	19000	6	1.65	1.55	320	1	32	67	27		
05.02	4407	1.89		41	10	2	8	10.3	5.1	14.3	19000	45	1.55	1.43	330	2	31	67	27		
06.02	4421	1.89		35	10	2	8	10.4	4.6	14.2	18900	55	1.60	1.45	330	2	31	66.5	25		
07.02	4437	1.89		37	11	2	9	10.3	4.7	14.2	19000	5	1.50	1.45	340	2	31	66.5	27		
08.02	4437	1.89		38	10	2	9	10.5	4.7	14.4	19000	55	1.65	1.57	350	2	31	66.5	27		
09.02	4448	1.88		35	10	2	10	10.5	4.7	14.3	18700	45	1.55	1.7	350	2	31	67	25		

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