HYDRO

RFT RESULTS

WELL: 30/9-6

Run/ Test no.	Depth (m RKB)	IHP (bar)	FP (bar)	FHP (bar)	Permeability/ Remarks
2A/1	2591.80	310.816	-9999.000	-9999.000	Seal failure
2A/2	2592.50	310.885	281.435	310.885	V good perm
2A/3	2595.50	311.229	-9999.000	311.229	Tight
2A/4	2611.50	313.160	282.424	313.181	Fair-poor perm
2A/5	2615.50	313.608	-9999.000	313.608	Seal failure
2A/6	2616.00	313.642	283.649	313.677	V good perm
2A/7	2619.00	313.987	283.832	313.987	V good perm
2A/9	2640.00	316.538	285.963	316.538	Good perm
2A/10	2643.00	316.780	286.146	316.849	V good perm
2A/11	2662.50	319.193	287.133	319.193	V good perm
2A/12	2678.00	321.041	288.548	321.020	V good perm
2A/13	2687.00	321.944	289.359	321.951	Excellent perm
2A/14	2694.00	322.813	290.058	322.806	V gd-exc.perm
2A/15	2986.00	356.776	346.173	356.824	Fair-good
2A/16	2996.00	357.927	347.122	357.962	Fair perm
2A/17	3002.50	358.734	347.954	358.803	V gd-exc.perm

All pressures from HP-gauge, units bar.

Value -9999.000 indicates missing data.

HYDRO

RFT RESULTS

WELL: 30/9-6

Run/ Test no.	Depth (m RKB)	IHP (bar)	FP (bar)	FHP (bar)	Permeability/ Remarks
2B/1	2592.50	311.009	282.471	310.967	V good perm
2B/2	2611.50	313.256	283.395	313.208	Good perm
2B/3	2616.00	313.691	283.657	313.691	Fair–good perm
2B/4	2619.00	314.091	283.871	314.049	V good–exc. perm
2B/5	2640.00	316.552	-9999.000	-9999.000	Tight
2B/6	2640.50	316.593	285.981	316.566	V good perm
2B/7	2643.00	316.849	286.167	316.849	V good perm

All pressures from HP–gauge, units bar.

Value -9999.000 indicates missing data.

HYDRO

DST RESULTS	WELL: 30/9-6
DST # 1	Main Flow period
Interval: 2637.9 – 2645.5 mRKB	(2637.3 – 2644.8 mTVD)
Choke Size, mm(inch)	7.94 (20/64")
Oil flowrate Sm^3/D, (B/D)	185 (1164)
Gas flowrate Sm^3/D, (Scf/D)	17175 (606535)
Gas oil ratio Sm^3/Sm^3	92.8
Oil density g/cc (°API)	0.855 (34)
Gas density (air=1)	0.698
WHP, bar (psia)	97.0 (1407)
Flowing BH Pressure,bar (psia)	271.68 (3940)
Initial BH Pressure,bar (psia)	281.6 (4084)
WHT,°C (°F)	18.4 (65)
BHT,°C (°F)	100 (212)
CO_2 %:	1.0
H_2S , ppm	0
B S & W (%)	0
Separator P (bar)	30
Separator T (°C)	52
Flowing time:	12 hours and 2 minutes
Build up time:	16 hours and 2 minutes

HYDRO

DST RESULTS	WELL: 30/9-6
DST # 2	Main Flow period
Interval: 2591.5-2596.5 mRKB	(2590.9-2595.9 mTVD)
Choke Size, mm(inch)	7.94 (20/64")
Oil flowrate Sm^3/D, (B/D)	166 (1044)
Gas flowrate Sm^3/D, (Scf/D)	16980 (599649)
Gas oil ratio Sm^3/Sm^3	102.3
Oil density g/cc (°API)	0.856 (33.8)
Gas density (air=1)	0.698
WHP, bar (psia)	91.4 (1326)
Flowing BH Pressure,bar (psia)	254.64 (3693)
Initial BH Pressure,bar (psia)	276.7 (4013)
WHT,°C (°F)	18.1 (65)
BHT,°C (°F)	100 (212)
CO_2 %:	1.0
H_2S , ppm	0
B S & W (%)	0
Separator P (bar)	35
Separator T (°C)	55
Flowing time:	22 hours 16 minutes
Build up time:	20 hours 45 minutes

6.5 Mud report

36" hole

Drilled to 213,5 m with high viscous pills pumped on each connection. At TD, a 10 m^3 high viscous pill was circulated around prior to make a wiper trip. Back on bottom another 10 m^3 pill was pumped around before the hole was displaced with 65 m^3 high viscous mud. The 30" casing was then run and cemented.

17 1/2" hole

The cement, shoe + 5,5 m new formation was drilled with a 17 1/2" bit + 26" holeopener. Tripping in with a new bit, drilling continued to 597 m with high viscous pills on every second connection. At this stage the hole was displaced with 60 m^3 of 1.20 rd mud. A wiper trip to the 30" shoe proved a slick hole. Drilling continued to TD of the section at 970 m with high viscous pills on every connection. The hole was displaced with 120 m^3 1,20 rd mud before making a wiper trip to the shoe. During this trip, no hole problems were experienced. The hole was then displaced with 150 m^3 of 1,20 rd before pulling out. Casing was then run and cemented.

12 1/4" hole

Cement and shoe was drilled using seawater. While drilling new formation, the hole was displaced to 1,34 rd KCl/polymer mud. Drilling continued to 1345 m where the bit was pulled. Maximum overpull of 131 kN was recorded at 1223 m. 3 m fill was recorded when running back in. Drilling continued then to 1512 m where the bit was pulled.

No hole problems were encountered during the trip out. When running back in, the hole was washed and reamed from 1480 m to 1512 m. After having drilled through extremely hard silicious sandstone, the bit was pulled at 1516,5 m. No hole problems during the trip. The next bit drilled to 1902 m and no hole problems was observed during the trip. Drilling continued to 2181 m where the ROP dropped. The bit proved to be balled up with claystone. At this stage all the processing equipment were running at their optimum to control the increasing build up of fine solids.
Tight spots at 2027 m - 2064 m and 2146 m - 2181 m were washed and reamed through when running back in.
The new bit drilled to 2400 m with occasional bit balling which was cured with a 25 kg/m^3 Wallnut pill. The round trip indicated no hole problems and the next two bits drilled to TD at 2587 m. A wiper trip and trip out of hole at TD indicated no hole problems and the hole was logged and cased off.

8 1/2" hole

The first bit drilling the shoe, was pulled after only one metre of new hole to 2588 m. The next bit hit sand at 2593,5 m and was pulled for coring. The mud weight in this section was cut back from 1,40 to 1,21 using unweighted premix to reduce the gradual increase of solids being built up in the previous section. Coring was performed from 2604 m to 2686 m in four runs. Minor problems on trips were experienced. The hole was reamed through the coring section when running in with the next bit and then drilled to 2721 m. POOH caused no problems. Another two bit runs were necessary to reach TD which was 3034 m. No problems were seen when POOH. The hole was then logged and 7" liner was successfully run and cemented. The well was then plugged back and tested.

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(ooo)
Norsk
Hydro

Daily mud properties — Date 11/11-1987

System : Boredata Sandnes
Well: 30/9-6
Mud Contractor: Dresser Magcobar
Data: "Mid depth" from table 3, otherwise from table 14 — 3

Date 11/11-1987
14 3

Date	Mid. depth m,MD	Mud dens. (SG)	PV cps	YP mPa	GEL 0 mPa	GEL 10 mPa	Ph	100 psi (cc)	HP/HT (cc)	Cl- inn/out mg/l	Alkalinity Pf	Alkalinity Pm	Alkalinity Mf	Ca++ inn/out mg/l	Oil %	Sol %	H2O %	V.G. meter at 115 gr. F 600 rpm	300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	Mud type
870308	160	1.03	0	0																				SPUD
870309	214	1.03	0	0																				SPUD
870310	863	1.03	0	0																				SPUD
870311	970	1.03	0	0																				SPUD
870312	970	1.34	27	11	1	2	9.4	3.6		88000/88000	0	1	0.6			14		76	49	38	24	3	2	KCl/Polymer
870313	1438	1.34	28	12	1	2	9	4.4		90000/90000	0	0.5	0.8			14		80	52	40	26	3	2	KCl/Polymer
870314	1527	1.4	37	18	2	3	8.8	4		100000/100000	0	0.7	0.6			16		109	72	57	37	5	3	KCl/Polymer
870315	1888	1.4	31	12	1	2	9.4	4.2		97000/97000	0.1	0.8	0.5			16		85	54	41	26	4	3	KCl/Polymer
870316	2136	1.4	30	12	2	4	8.7	4.2	17.4	99000/98000		0.6	0.5			17		84	54	41	25	3	2	KCl/POLYMER
870317	2267	1.4	32	12	2	8	8.7	4.8	16.8	95000/95000		0.6	0.5			17		88	56	42	26	4	3	KCl/POLYMER
870318	2399	1.4	34	13	3	18	9	5.2	12.6	100000/100000	0.1	0.6	0.7			18		94	60	46	29	6	4	KCl/POLYMER
870319	2472	1.4	32	10	3	15	8.7	4.2	17.7	98000/98000	0.1	0.7	0.8			17		84	52	39	25	5	4	KCl/POLYMER
870320	2528	1.4	33	9	2	11	9.3	3.6	16.4	99000/99000	0	0.7	0.5			17		84	51	39	24	4	3	KCl/POLYMER
870321	2587	1.4	31	9	2	10	8.8	4	12.8	100000/100000	0	0.7	0.6			18		79	48	37	23	5	4	KCl/POLYMER
870322	2587	1.4	31	9	2	10	8.8	4	12.8	100000/100000	0	0.7	0.6			18		79	48	37	23	5	4	KCl/POLYMER
870323	2587	1.21	17	6	1	2	8.6	4.4	16.2	74000/74000	0	0.6	0.5			10		45	28	19	12	2	1	KCl/POLYMER
870324	2593	1.21	27	10	1	4	10.2	4	14.2	79000/79000	0.1	1.5	0.5			10		74	47	36	24	3	2	KCl/POLYMER
870325	2624	1.21	27	10	2	3	9.6	4	14.1	76000/76000	0.2	1.1	0.6			10		74	47	36	23	3	2	KCl/POLYMER
870326	2651	1.21	26	10	2	2	10.6	4	13.8	76000/76000	0.2	1.3	0.5			10		72	46	35	22	3	2	KCl/POLYMER
870327	2686	1.21	27	10	2	2	10.4	4.2	15	77000/77000	0.4	1.2	0.6			11		74	47	35	22	3	2	KCl/POLYMER
870328	2759	1.21	24	9	1	2	9.2	4	14.2	74000/74000	0.1	0.7	0.3			11		65	41	31	20	3	2	KCl/POLYMER
870329	2858	1.21	24	8	1	2	8.9	4.2	13.8	71000/71000	0.1	0.7	0.3			11		64	40	30	19	3	2	KCl/POLYMER
870330	3034	1.21	24	10	1	2	9.1	3.9	13.9	74000/74000	0.1	0.7	0.4			11		67	43	32	20	3	2	KCl/POLYMER
870331	3034	1.21	24	10	1	2	9	3.8		74000/74000	0.1	0.7	0.3			11		67	43	32	20	3	2	KCl/POLYMER
870401	3034	1.21	24	9	1	2	9	3.8		74000/74000	0	0.7	0.3			11		66	42	31	20	3	2	KCl/POLYMER
870402	3034	1.21	25	9	1	3	11.8	4.4		70000/70000	0.3	3.5	1.6			11		68	43	32	21	3	2	KCl/POLYMER
870403	2965	1.21	28	11	1	5	10.8	4.6	14	69000/69000	0.2	2.8	0.9			11		78	50	38	23	4	3	KCl/POLYMER
870404	2965	1.21	27	11	1	5	10.8	4.2	13.2	69000/69000	0.2	2.8	0.9			11		76	49	37	23	4	3	KCl/POLYMER
870405	2965	1.21	27	11	1	5	10.8	4.2	13.2	69000/69000	0.2	2.8	0.9			11		76	49	37	23	4	3	KCl/POLYMER
870406	2965	1.21	27	11	1	5	10.8	4.2	13.2	69000/69000	0.2	2.8	0.9			11		76	49	37	23	4	3	KCl/POLYMER
870407	2965	1.21	27	11	1	5	10.8	4.2	13.2	69000/69000	0.2	2.8	0.9			11		76	49	37	23	4	3	KCl/POLYMER
870408	2965	1.21	27	11	1	5	10.8	4.2	13.2	69000/69000	0.2	2.8	0.9			11		76	49	37	23	4	3	KCl/POLYMER
870409	2965	1.21	25	10	1	4	10.4	4.4	13.8	67000/67000	0.2	2.6	0.8			11		70	45	35	22	3	2	KCl/POLYMER
870410	2634	1.21	26	10	1	3	10.8	4.2	13.4	67000/67000	0.2	2.4	0.8			11		72	46	35	22	3	2	KCl/POLYMER
870411	2634	1.21	26	10	1	3	10.8	4.2	13.2	67000/67000	0.2	2.4	0.8			11		72	46	35	22	3	2	KCl/POLYMER
870412	2634	1.21	26	10	1	3	10.8	4.2	13.2	67000/67000	0.2	2.4	0.8			11		72	46	35	22	3	2	KCl/POLYMER
870413	2634	1.21	26	9	1	3	10.8	4.2	13.4	67000/67000	0.2	2.4	0.7			11		71	45	34	21	3	2	KCl/POLYMER
870414	2634	1.21	20	7	1	3	10.8	4.2	13.4	65000/65000	0.2	2.4	0.7			11								KCl/POLYMER
870415	2465	1.21	22	7	1	3	10.4	4.4	13.4	65000/65000	0.1	1.8	0.6			11		58	36	29	18	3	2	KCl/POLYMER
870416	2350	1.21	25	9	2	4	10.2	4.4	13.2	65000/65000	0.1	1.7	0.6			11		69	44	34	22	3	2	KCl/POLYMER

((((ooo) Norsk Hydro	Daily mud properties System : Boredata Sandnes Well: 30/9-6 Mud Contractor: Dresser Magcobar Data: "Mid depth" from table 3, otherwise from table 14	Date 11/11-1987 3	Date 11/11-1987 14 3

Date	Mid. depth m,MD	Mud dens. (SG)	PV cps	YP mPa	GEL 0 mPa	GEL 10 mPa	Ph	100 psi (cc)	HP/HT (cc)	Cl- inn/out mg/l	Alkalinity Pf	Pm	Mf	Ca++ inn/out mg/l	Oil %	Sol %	H2O %	V.G. meter at 115 gr. F 600 rpm	300 rpm	200 rpm	100 rpm	6 rpm	3 rpm	Mud type
870417	2350	1.21	25	9	1	3	10.6	4.6	15.2	64000/64000	0.2	1.9	0.6			11		69	44	33	21	3	2	KCl/POLYMER
870418	165	0	0	0																				KCl/POLYMER
870419	131	0	0	0																				KCl/POLYMER
870420	124	0	0	0																				KCl/POLYMER
870421	0	0	0	0																				KCL/POLYMER
870422	0	0	0	0																				KCL/POLYMER

((((ooo) Norsk Hydro	Mud consumption System : Boredata Sandnes Well: 30/9-6 Mud company: Dresser Magcobar	Date 14/10-1987 13

Hole size: 36

BENTONITE	(Mt)	18
CAUSTIC SODA	(Kg)	110
SODA ASH	(Kg)	100

Hole size: 17.5

BARITE	(Mt)	55
BENTONITE	(Mt)	25
CAUSTIC SODA	(Kg)	410
LIME	(Kg)	504
SODA ASH	(Kg)	80

Hole size: 12.25

BARITE	(Mt)	95
CAUSTIC SODA	(Kg)	2710
POTASSIUM CL. (KCl)	(Kg)	38984
POTASSIUM CL. (KCl) Brine	(m3)	212
SODA ASH	(Kg)	720
SODIUM BICARBONATE	(Kg)	860
PAC POLYMER REG	(Kg)	3613
PAC POLYMER SUPER	(Kg)	3643
XANTAN POLYMER	(Kg)	538
WALLNUT	(Kg)	250

Hole size: 8.5

BARITE	(Mt)	24
CAUSTIC SODA	(Kg)	40
GYPSUM	(Kg)	1605
LIME	(Kg)	222
POTASSIUM CL. (KCl)	(Kg)	3152
POTASSIUM CL. (KCl) Brine	(m3)	65
SODIUM BICARBONATE	(Kg)	2476
PAC POLYMER REG	(Kg)	1975
PAC POLYMER SUPER	(Kg)	932
XANTAN POLYMER	(Kg)	278

Hole size: 1

BARITE	(Mt)	3
GYPSUM	(Kg)	409
SODIUM BICARBONATE	(Kg)	452
PAC POLYMER SUPER	(Kg)	358

Hole size: 2

POTASSIUM CL. (KCl)	(Kg)	3132
POTASSIUM CL. (KCl) Brine	(m3)	5
PAC POLYMER SUPER	(Kg)	358