

Norsk Hydro

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 25/7-5

Hole section: 36\* WATER BASED SYSTEM

Date	Depth		Mud Type	Dens [sg]	Filtrate		Filt.cake		HPHT Press/Temp [psi/DegC]	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
	[m]	TVD			API	HPHT	API	HPHT			Pm	Pf	Mf							Oil	Sand	Sand			
16-jul-1997 20:00	154	154	SPUD MUD	1.06	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
17-jul-1997 20:00	209	209	SPUD MUD	1.06	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
18-jul-1997 20:00	209	209	SPUD MUD	1.06	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
19-jul-1997 20:00	209	209	SPUD MUD	1.06	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0

Hole section: 17 1/2\* WATER BASED SYSTEM

Date	Depth		Mud Type	Dens [sg]	Filtrate		Filt.cake		HPHT Press/Temp [psi/DegC]	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
	[m]	TVD			API	HPHT	API	HPHT			Pm	Pf	Mf							Oil	Sand	Sand			
20-jul-1997 20:00	671	671	SPUD MUD	1.06	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
21-jul-1997 20:00	702	702	SPUD MUD	1.06	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
22-jul-1997 20:00	1221	1221	SPUD MUD	1.06	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
23-jul-1997 20:00	1338	1338	SPUD MUD	1.20	0.0	0.0	0	0	0/0	0.0	0.0	0.0	0.0	0	0	0	0	0	0	0.0	0.0	0.0	0	0.0	0
24-jul-1997 20:30	1338	1338	ANCO 2000	1.20	2.2	0.0	0	0	0/0	8.6	0.0	0.0	0.5	152	79700	75000	220	0	300	17.5	0.0	0.0	0	0.0	14

Hole section: 12 1/4\* WATER BASED SYSTEM

Date	Depth		Mud Type	Dens [sg]	Filtrate		Filt.cake		HPHT Press/Temp [psi/DegC]	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
	[m]	TVD			API	HPHT	API	HPHT			Pm	Pf	Mf							Oil	Sand	Sand			
25-jul-1997 22:00	1338	1338	ANCO 2000	1.45	2.3	0.0	0	0	0/0	8.6	0.0	0.0	0.5	150	78700	75000	200	0	280	17.5	0.0	0.0	0	0.0	14
26-jul-1997 18:00	1341	1341	ANCO 2000	1.45	2.3	0.0	0	0	0/0	10.2	0.0	0.6	0.9	144	75500	75000	380	0	420	17.5	0.0	0.2	0	0.0	14
27-jul-1997 20:15	1886	1886	ANCO 2000	1.45	2.3	0.0	0	0	0/0	8.2	0.0	0.0	0.7	126	66100	73500	180	0	260	18.0	0.0	0.3	11	0.0	45
28-jul-1997 20:00	1886	1886	ANCO 2000	1.45	2.2	0.0	0	0	0/0	8.2	0.0	0.0	0.7	122	64000	74500	160	0	240	17.5	0.0	0.3	11	0.0	16

Hole section: 8 1/2\* WATER BASED SYSTEM

Date	Depth		Mud Type	Dens [sg]	Filtrate		Filt.cake		HPHT Press/Temp [psi/DegC]	pH	Alcalinity			Inhib Chem	K+	CL-	Ca++	Mg++	Tot hard	Percentage			CEC [Kg/m3]	ASG [sg]	LGS [Kg/m3]
	[m]	TVD			API	HPHT	API	HPHT			Pm	Pf	Mf							Oil	Sand	Sand			
29-jul-1997 22:00	1862	1862	ANCO 2000	1.20	2.4	0.0	0	0	0/0	8.5	0.0	0.0	0.0	151	79700	73500	240	0	520	10.0	0.0	0.0	0	0.0	20
30-jul-1997 22:00	1977	1977	ANCO 2000	1.20	2.2	0.0	0	0	0/0	8.5	0.0	0.0	0.4	152	79700	77500	460	0	520	10.0	0.0	0.1	11	0.0	9
31-jul-1997 23:59	1986	1986	ANCO 2000	1.20	2.2	0.0	0	0	0/0	8.4	0.0	0.0	0.4	148	77600	76000	420	0	0	10.0	0.0	0.1	8	0.0	13
01-aug-1997 22:00	2030	2030	ANCO 2000	1.20	2.2	0.0	0	0	0/0	0.0	0.0	0.0	0.4	147	77600	76000	420	0	0	10.0	0.0	0.1	0	0.0	13
02-aug-1997 22:00	2058	2058	ANCO 2000	1.20	2.2	0.0	0	0	0/0	8.4	0.0	0.0	0.4	145	76000	77500	440	0	0	11.0	0.0	0.1	8	0.0	63
03-aug-1997 21:30	2060	2060	ANCO 2000	1.22	2.2	0.0	0	0	0/0	8.3	0.0	0.0	0.3	146	76600	78000	460	0	0	11.5	0.0	0.1	6	0.0	56
04-aug-1997 22:00	2093	2093	ANCO 2000	1.25	2.3	0.0	0	0	0/0	8.2	0.0	0.0	0.3	145	76000	78000	460	0	0	12.0	0.0	0.1	6	0.0	35
05-aug-1997 21:00	2148	2148	ANCO 2000	1.25	2.3	0.0	0	0	0/0	8.2	0.0	0.0	0.3	144	75500	78000	460	0	0	12.1	0.0	0.1	12	0.0	40
06-aug-1997 19:40	2491	2490	ANCO 2000	1.23	2.2	0.0	0	0	0/0	8.1	0.0	0.0	0.4	140	73400	76000	420	0	480	12.0	0.0	0.4	13	0.0	72
07-aug-1997 22:00	2736	2735	ANCO 2000	1.23	2.3	0.0	0	0	0/0	8.1	0.0	0.0	0.4	140	73400	75000	400	0	480	12.1	0.0	0.4	12	0.0	80
08-aug-1997 17:00	2736	2735	ANCO 2000	1.23	2.3	0.0	0	0	0/0	8.1	0.0	0.0	0.3	140	73400	75000	420	0	480	12.0	0.0	0.3	12	0.0	75
09-aug-1997 13:00	2736	2735	ANCO 2000	1.23	2.3	0.0	0	0	0/0	8.1	0.0	0.0	0.3	140	73400	75000	420	0	480	12.0	0.0	0.3	12	0.0	75
10-aug-1997 17:00	2736	2735	ANCO 2000	1.23	2.3	0.0	0	0	0/0	8.1	0.0	0.0	0.3	140	73400	75000	420	0	480	12.0	0.0	0.3	12	0.0	75

See also the report 'DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS'

Norsk Hydro

DAILY MUD PROPERTIES : OTHER PARAMETERS FOR WELL 25/7-5

Hole section: 8 1/2"

WATER BASED SYSTEM

Date	Depth		Mud Type	Dens	Filtrate		Filt.cake		HPHT	pH	Alcalinity			Inhib	K+	CL-	Ca++	Mg++	Tot	Percentage			CEC	ASG	LGS	
	MD	TVD			API	HPHT	API	HPHT			Press/Temp	Pm	Pf							Mf	Chem	hard				Solid
				[sg]	[ml]	[ml]	[mm]	[mm]	[psi/DegC]		[ml]	[ml]	[ml]	[Kg/m3]	[mg/l]	[mg/l]	[mg/l]	[mg/l]	[mg]	[%]	[%]	[%]	[Kg/m3]	[sg]	[Kg/m3]	
11-aug-1997	17:30	2736	2735	ANCO 2000	1.22	2.4	0.0	0	0	0/0	8.3	0.0	0.0	0.3	140	73400	75000	420	0	480	12.0	0.0	0.3	11	0.0	91
12-aug-1997	15:00	2148	2148	ANCO 2000	1.21	3.0	0.5	0	0	0/0	8.3	0.0	0.0	0.3	145	76000	80000	480	0	480	11.7	0.0	0.3	10	0.0	79
13-aug-1997	15:00	2144	2144	ANCO 2000	1.21	3.0	0.5	0	0	0/0	8.1	0.0	0.0	0.4	145	76000	80000	500	0	460	11.7	0.0	0.1	10	0.0	79
14-aug-1997	15:00	2144	2144	ANCO 2000	1.21	3.0	0.5	0	0	0/0	8.1	0.0	0.0	0.4	145	76000	80000	500	0	460	11.7	0.0	0.1	10	0.0	79
15-aug-1997	14:30	2144	2144	ANCO 2000	1.21	3.0	0.5	0	0	0/0	8.2	0.0	0.0	0.4	145	76000	80000	500	0	480	11.7	0.0	0.1	11	0.0	79
16-aug-1997	22:00	2144	2144	ANCO 2000	1.21	3.0	0.5	0	0	0/0	8.1	0.0	0.0	0.4	140	73400	80000	500	0	480	11.7	0.0	0.1	11	0.0	79
17-aug-1997	18:00	2144	2144	ANCO 2000	1.21	3.0	0.5	0	0	0/0	8.1	0.0	0.0	0.4	140	73400	80000	500	0	480	11.7	0.0	0.1	0	0.0	79
22-aug-1997	21:00	2144	2144	ANCO 2000	1.21	3.0	0.0	0	0	0/0	8.1	0.0	0.0	0.4	140	73400	80000	500	0	480	11.5	0.0	0.1	11	0.0	79
23-aug-1997	16:00	2144	2144	ANCO 2000	1.21	3.0	0.0	0	0	0/0	8.1	0.0	0.0	0.4	140	73400	80000	500	0	480	11.5	0.0	0.1	11	0.0	79
24-aug-1997	17:30	2144	2144	ANCO 2000	1.21	3.0	0.0	0	0	0/0	8.2	0.0	0.0	0.4	140	73400	80000	500	0	480	11.5	0.0	0.1	11	0.0	79
25-aug-1997	15:00	2144	2144	ANCO 2000	1.21	3.0	0.0	0	0	0/0	8.1	0.0	0.0	0.4	140	73400	80000	500	0	480	11.5	0.0	0.1	11	0.0	79
26-aug-1997	12:00	1800	1800	ANCO 2000	1.21	2.8	0.0	0	0	0/0	8.1	0.0	0.0	0.4	140	73400	80000	500	0	480	11.5	0.0	0.1	11	0.0	79
27-aug-1997	16:00	1800	1800	ANCO 2000	1.21	2.8	0.0	0	0	0/0	8.1	0.0	0.0	0.5	140	73400	80000	560	0	520	11.5	0.0	0.1	11	0.0	68
28-aug-1997	16:00	850	850	ANCO 2000	1.27	3.0	0.0	0	0	0/0	8.5	0.0	0.0	0.6	140	73400	80000	560	0	520	11.5	0.0	0.1	11	0.0	68
29-aug-1997	09:00	350	350	ANCO 2000	1.27	3.0	0.0	0	0	0/0	8.5	0.0	0.0	0.6	140	73400	80000	560	0	520	11.5	0.0	0.1	11	0.0	68

See also the report 'DAILY MUD PROPERTIES : RHEOLOGY PARAMETERS'

TOTAL CONSUMPTION OF MUD ADDITIVES ON WELL 25/7-5

Section Size	Product/Additive	Total	Total	Unit	Difference		Difference in cost	
		Amount Planned	Amount Used		Amount	%	%	[kNOK]
36"	BARITE		48000.0	kg				
	BENTONITE		47000.0	kg				
	LIME		430.0	kg				
	SODA ASH		425.0	kg				
17 1/2"	BARITE		129000.0	kg				
	BENTONITE		62000.0	kg				
	KCL BRINE		26000.0	l				
	LAMPAC EXLO		800.0	kg				
	LIME		240.0	kg				
	RHODOPOL 23P		300.0	kg				
12 1/4"	SODA ASH		325.0	kg				
	ANCO 208		13000.0	l				
	BARITE		186000.0	kg				
	BENTONITE		6000.0	kg				
	CITRIC ACID		250.0	kg				
	FLOW ZAN		1375.0	kg				
	KCL BRINE		235000.0	l				
	KCL POWDER		6000.0	kg				
	LAMPAC EXLO		5075.0	kg				
	MICA COARSE		200.0	kg				
	MICA FINE		250.0	kg				
	NUTPLUG C		125.0	kg				
	RHODOPOL 23P		325.0	kg				
8 1/2"	SODA ASH		25.0	kg				
	SODIUM BICARBONATE		150.0	kg				
	ANCO 208		13400.0	l				
	ANTISOL FL10		3000.0	kg				
	BARITE		89000.0	kg				
	CITRIC ACID		1075.0	kg				
	FLOW ZAN		3000.0	kg				
	KCL BRINE		371000.0	l				
	LAMPAC EXLO		4225.0	kg				
	SODIUM BICARBONATE		1350.0	kg				

TOTAL CONSUMPTION OF MUD ADDITIVES ON WELL 25/7-5

Section	Product/Additive	Total		Unit	Difference		Difference in cost	
		Amount	Amount		Amount	%	%	[kNOK]
Size		Planned	Used					
8 1/2"	SODIUM CHLORIDE		50.0	kg				



## FORMATION PRESSURE WORKSHEET

Well Nam '25/7-5

Rig : West Vanguard

Date : 09.-10.08.97

Pressure Units : Bars

RKB-MSL : 22 m. MSL-SBed 124 m.

Witnessed by : Skjld/Nyby/Nilsen/Vik

Run No./ Test No.	Depth		Initial Hydrostatic Pressure		Formation Pressure		Final Hydrostatic Pressure		Time		Formation Pressure sg EMD	Test Temp degC	Good Data? Y/N	Sample Information			Remarks
	mMD RKB	mTVD RKB	Strain	Qtz	Strain	Qtz	Strain	Qtz	hh:mm					Main Fluid Type	HC Gravity g/cc	Sample Vol, cc	
									Set	Retract							
1A/31	2116,4	2116	262,9	263,40	212,7	213,30			05:44	06:50			Y	Oil		225?	Bottle # 5, AA643, lost seal
1A/32	2045,6	2045,2	254,1	254,66					07:04	07:15		65,8	N				Attempt to sample, tight,
	2045,6	2045,6							07:36	07:41		64,8	N				Attempt to sample, tight,
1A/33	2045,4	2045,6	254,2	254,72					07:43	07:50		62,7	N				Attempt to sample, tight,
	2045,4	2045,6	254,0	254,46	203,6	203,08			07:55	08:05		62,7	Y				Attempt to sample, lost seal
	2045,4	2045,6	255,0	254,55	203,5	203,10			08:07	08:27		62,7	Y				Att to sample, PC failure
	2045,4	2045,6	254,9	254,54					08:32	08:45		62,7	N				Attempt to sample, tight,
	2045,4	2045,6	254,9	254,54					08:46	08:52		62,7	N				Att to sample, PC failure
	2045,4	2045,6	254,9	254,54					09:06	09:07		62,7	N				Attempt to sample, tight,
	2045,4	2045,6	254,4	254,82					09:11	09:43		62,7	N				Attempt to sample, tight,
	2045,4	2045,6	254,4	254,82					09:46	10:12		62,7	N				Attempt to sample, plugged
	2045,4	2045,6							10:12	10:23		62,7	N			?	Draw-down to 46-48bar.
	2045,4	2045,6	254,9	254,43	2 035,0	203,10			10:23	10:36		62,7	Y	Oil		2,75gal	Chamber # 18
	2045,4	2045,6	254,9	254,43	2 035,0	203,10			10:40	10:55		62,7	Y	Oil		450	Bottle # 6, AA644

NB: Fmtn Press sg calculated from RKB

Page : 3 of 3



## FORMATION PRESSURE WORKSHEET

Well Nam '2577-5

Rig : West Vanguard

Date : 09.-10.08.97

Pressure Units : Bars

RKB-MSL : 22 m.

MSL-SBed: 124 m.

Witnessed by : Skjold/Nyby/Nilsen/Vik

Run No./ Test No.	Depth		Initial Hydrostatic Pressure		Formation Pressure		Final Hydrostatic Pressure		Time hh:mm		Formation Pressure sg EMD	Test Temp degC	Good Data? Y/N	Sample Information			Remarks
	mMD RKB	mTVD RKB	Strain	Qtz	Strain	Qtz	Strain	Qtz	Set	Retract				Main Fluid Type	HC Gravity g/cc	Sample Vol, cc	
	1A																
1A/16	2127	2126,6	265,1	264,61	203,2	202,64	264,9	264,42	21:10	21:20	0,97	64,6	Y				1083,6mD/Cp
1A/17	2128	2127,6	265,1	264,63	203,3	202,75	265	264,52	21:33	21:40	0,97	65	Y				154,1mD/Cp
1A/18	2128,7	2123,3	265,2	264,71	203,4	202,82	265,2	264,65	21:42	21:48	0,97	65,3	Y				212,2Md/cP
1A/19	2132	2131,6	265,7	265,18	203,7	203,15	265,6	265,06	21:50	21:59	0,97	65,5	Y				11,6Md/cP
1A/20	2155	2154,6	268,9	268,23	206	205,49	268,4	267,89	22:02	22:08	0,97	65,7	Y				124,9Md/cP
1A/21	2200	2199,6	274,5	274,06	210,5	210,04	273,9	273,47	22:13	22:20	0,97	66	Y				193Md/cP
1A/22	2260	2259,5	284,9	284,44	216,2	215,74	281,1	280,65	22:25	22:35	0,97	66,8	Y				142,9Md/cP
1A/23	2450	2449,4	305,8	305,47	235,6	235,2	305	304,62	22:50	22:57	0,98	68,9	Y				112,8Md/cP
1A/24	2530	2529,4	315,3	314,94	243,9	243,54	314,6	314,29	23:02	23:08	0,98	70	Y				11,5Md/cP
1A/25	2625	2624,3	327,2	326,91	253,5	253,15			23:14	23:21	0,98	72,5	N				
1A/26	2625	2624,3							23:40	23:42			N				
1A/27	2625	2624,3	325,6	325,27	253,6	253,13	325,7	325,28	23:50	23:55	0,98	76	Y				17,5Md/cP
1A/28	2127	2126,6	265,0	265,32	202,2	202,70			00:48	01:05	0,97	66,6	Y				
		2127							02:11	02:26	0,97	66,6	Y	Water/Oil		450	Bottle #1, AA677
1A/29	2127,5	2127,1	264,3	264,73	202,3	202,81			02:34	03:04	0,97	66,6	Y				
		2127,5							03:40	03:55	0,97	66,6	Y	Water		450	Bottle #2, AA695
		2127,5							04:09	04:26	0,97	66,6	Y	Water		450	Bottle #3, AA609
1A/30	2126,7	2126,3	264,2	264,61	202,2	202,74			04:45	04:48	0,97	66,6	Y				
		2126,7							05:00	05:32	0,97	66,6	Y	Oil		450	Bottle #4, AA610

NB: FmIn Press sg calculated from RKB

Page : 2 of 3



## FORMATION PRESSURE WORKSHEET

Well Nam '25/7-5

Rig : West Vanguard

Date : 09-10.97

Pressure Units : Bars

RKB-MSL : 22 m.

MSL-SBed: 124 m.

Witnessed by : Skjold/Nyby/Nilsen/Vik

Run No./ Test No.	Depth		Initial Hydrostatic Pressure		Formation Pressure		Final Hydrostatic Pressure		Time hh:mm		Formation Pressure sg EMD	Test Temp degC	Good Data? Y/N	Sample Information			Remarks
	mMD RKB	mTVD RKB	Strain	Qtz	Strain	Qtz	Strain	Qtz	Set	Retract				Main Fluid Type	HC Gravity g/cc	Sample Vol, cc	
1A/1	2044,5	2044,1	256,4	256,50	203,4	203,09 ✓	255,0	254,73	16:25	16:30	1 013	56,0	Y				34,9mD/Cp
1A/2	2045,6	2045,2	254,8	254,58	203,5	203,16 ✓	254,6	254,21	16:35	16:40	1 012	58,0	Y				228mD/Cp
1A/3	2048,5	2048,1	255,3	255,04	203,8	203,38 ✓	255,2	254,85	16:43	16:49	1 012	59,0	Y				36,6mD/Cp
1A/4	2049,0	2048,6	255,5	255,15	203,8	203,41 ✓	255,3	254,86	16:52	16:57	1 012	60,0	Y				53,7mD/Cp
1A/5	2058,6	2058,2	256,7	256,32					17:00	17:05		60,0	N				Tight
1A/6	2058,4	2058,0	256,6	256,27					17:08	17:15		61,0	N				Tight
1A/7	2058,8	2058,4	256,6	256,27					17:19	17:25		61,0	N				Tight
1A/8	2059,5	2059,1	256,8	256,36					17:30	17:35		61,5	N				Tight
1A/9	2059,1	2058,7	256,4	256,08	204,6	204,18 ✓	256,6	256,10	17:45	17:51	1 011	62,5	Y				75,9mD/Cp
	2059,2	2058,8	255,8	256,25			255,8	256,26	19:00	19:04		62,5	N				Attempted to sample, no go
	2059,0	2058,6	256,8	256,29					19:05	19:09		62,5	N				Attempted to sample, no go
1A/11	2100,1	2 099,7	262,2	261,80			261,6	261,15	19:13	19:20			N				Tight
1A/12	2100,3	2 099,4	260,6	261,10			261,7	261,18	19:23	19:30			N				Tight
1A/13	2099,9	2 099,5	261,6	261,16			261,6	261,17	19:33	19:41		62,0	N				Tight
1A/14	2116,6	2 116,2	263,9	263,45			263,6	263,15	19:45	20:02		62,5	N				Supercharged
1A/15	2116,4	2 116,0	263,7	263,22	213,6	213,10	263,8	263,34	20:04	20:18	1 026	62,6	Y				?? mD/Cp
	2116,4								20:18	20:45		62,6	N				Attempted to sample, no go
	2116,4								20:57	21:08		62,6	N				Attempted to sample, no go

NB: Fmtn Press sg calculated from RKB

Page : 1 of : 3



# E&P Division

Access
Confidential
Downgrading
Retention
Unlimited

**OLJEDIREKTORATET**  
 - 9 Mars 1998  
 Sak/Dok.n. 97: 1342 - 8

Title		Reservoir geochemistry of well 25/7-5					
Keywords		Petroleum geochemistry, reservoir geochemistry, migrated hydrocarbons, biodegradation					
Document category	Document ID	Amendment no.					
Report	R-082706						
Area code	System code	Procurement ref./Package no.					
25/7							
SCM reference	Tag no.						
Quadrant/Block/Well	Licence no.	Project					
25/7-5	PL 203	2003947					
Pages/appendices/volume(s)	Replaces						
30/6/1							
Author(s)	Name(s)	Org. unit	Date	Signed			
	Elin Rein, Marian Våge, Anne Karin Syversen, Arne S. Steen	NH Research Centre	02.02.98	<i>[Signature]</i>			
Controlled	Name	Org. unit	Date	Signed			
	Nils Telnæs	NH Research Centre	02.02.98	<i>[Signature]</i>			
Verified	Name	Org. unit	Date	Signed			
	Tone Pedersen	NH Exploration	9/2-98	<i>[Signature]</i>			
Approved	Name	Org. unit	Date	Signed			
	Tore Grønvold	NH Exploration	9/2-98	<i>[Signature]</i>			
Rev./ status	Date	Reason for issue	Author	Contr.	Dis. appr.	Proj. appr.	Hydro appr.

BA 98-746-1  
 22 APR. 1998  
**REGISTER**  
 OLJEDIREKTORATET

Norsk Hydro a.s F.nr. 914 778 271

Postal address:	Office address:	Phone:	Telefax:	Telex:
N-5020 BERGEN NORWAY	Sandsliveien 90 5049 Sandsli	National: 55 99 50 00 Internat.: +47 55 99 50 00	National: 55 99 66 00 Internat.: +47 55 99 66 00	40632 hydro n



---

Title: Reservoir geochemistry of well 25/7-5

No. :

Rev. : 0

Date : 1998-02-02

Page : 6 of 30

---

2 INTRODUCTION

Core and drillcuttings (DC) samples are related to driller's depth. Fluid samples are related to logger's depth. The stratigraphy of well 25/7-5 is listed in Table 1.1.

The well was drilled using Spud mud down to 1332m and with Anco 2000 mud from 1332m to T.D. (2148m).

A list of all analysed samples is presented in Table 1.2. The analytical and preparative methods employed in this study comprised scanning fluorescence measurements, geochemical screening, gas characterisation and bitumen characterisation. Screening consisted of Rock Eval pyrolysis. Gas characterisation included gas volumetric and stable isotope analyses. Bitumen characterisation included solvent extraction followed by asphaltene precipitation, preparative group type separation by MPLC<sup>2</sup> and analytical group type separation by TLC-FID<sup>3</sup> (latroscan). Rock extracts and the oil samples were further analysed by gas chromatography (GC-FID) of saturated hydrocarbons, analysis of the saturated and aromatic hydrocarbon fractions by gas chromatography-mass spectrometry (GC-MSD<sup>4</sup>) and analysis of stable carbon isotopes (both fractions and gaseous compounds). The analyses were carried out according to the guidelines in the Norwegian Industry Guide to Organic Geochemical Analyses (NIGOGA<sup>5</sup>).

---

1 All depths in this report are in m RKB unless otherwise stated. Core and drillcuttings samples are related to driller's depth and fluid samples are related to loggers depth.  
2 Medium Pressure/Performance Liquid Chromatography  
3 Thin Layer Chromatography with Flame Ionisation Detection  
4 Mass-Selective Detector  
5 The Norwegian Industry Guide to Organic Geochemical Analyses, 3rd edition, 1993

---

Title: Reservoir geochemistry of well 25/7-5

No. :

Rev. : 0

Date : 1998-01-06

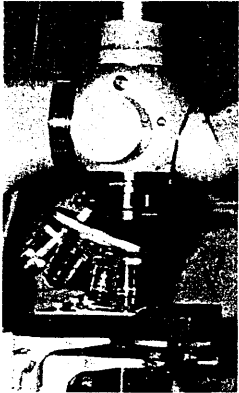
Page : 9 of 30

---

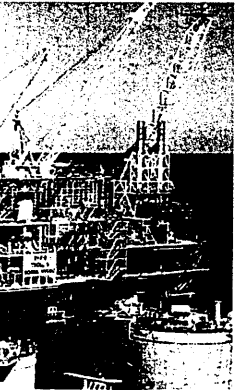
Gas analysis and stable carbon isotope analysis of the gaseous compounds and hydrocarbon fractions were undertaken out by IFE (Kjeller, Norway). All other analytical and interpretative work was carried out at the Norsk Hydro E&P Research Centre in Bergen, Norway.



# Reservoir Geochemistry of well 25/7-5



E. Rein, M. Våge,  
A. K. Syversen and A. S. Steen



02.02.98

**Table 2.2: List of samples analysed**

**ANALYSIS PROGRAMME, WELL NOR : 25/7-5**

**Petroleum Geochemistry Group  
Research Centre Bergen**

02-Feb-1998 12:47



Depth (m)	Lithology	Type	RockEval	RE/EXT	Extr	MPLC	Iatr	SatHC	Pyrolyse	Isot	Sat-biom	c5-20hc	Aro-hc	Vitr
1830.00	SST	DC	1	1	1		1	1			1			
1840.00	SST	DC	1											
1850.00	SST	DC	1											
1860.00	SST	DC	1	1	1		1	1			1			
1870.00	SST	DC	1											
2052.00		GAS								1				
2052.00		OIL			1	1	1	1		1	1	1	1	
2116.00		OIL			1	1	1			1				
2116.00		GAS								1				
2117.95	SST	COCH	1	1	1		1	1		1	1		1	
2119.10	SST	COCH	1	1	1		1	1		1	1		1	
2126.70		GAS								1				
2126.70		OIL			1	1	1			1				
2127.75	SST	COCH	1											
2128.50	SST	COCH	1	1	1		1	1		1	1		1	
2129.50	SST	COCH	1											
2130.50	SST	COCH	1											
2131.50	SST	COCH	1	1	1		1	1		1	1		1	
2132.50	SST	COCH	1											
2133.50	SST	COCH	1											
2133.75	SST	COCH	1	1	1		1	1		1	1		1	
2134.50	SST	COCH	1											
2135.50	SST	COCH	1											
2136.50	SST	COCH	1											

**Table 2.2: List of samples analysed**

**ANALYSIS PROGRAMME, WELL NOR : PSU/REF-NSO1**

**Petroleum Geochemistry Group**  
**Research Centre Bergen**  
 02-Feb-1998 12:47



Depth (m)	Lithology	Type	RockEval	RE/EXT	Extr	MPLC	Iatr	SatHC	Pyrolyse	Isot	Sat-biom	c5-20hc	Aro-hc	Vitr
		OIL						2			2		2	

MPLC = Separation

Extr = Extraction

SatGC = Saturated HC

Iatr = Iatroscan

Isot = Isotope data

Sat-biom = Biomarker data

Vitr = VR0 (ave) %

RE/EXT = Rock Eval on extracted Seciment

**Table 2.2: List of samples analysed**

**ANALYSIS PROGRAMME, WELL NOR : 24/9-6**

**Petroleum Geochemistry Group**  
**Research Centre Bergen**  
02-Feb-1998 12:47



Depth (m)	Lithology	Type	RockEval	RE/EXT	Extr	MPLC	Iatr	SatHC	Pyrolyse	Isot	Sat-biom	c5-20hc	Aro-hc	Vitr
2033.70	SST	COCH								1				

**Table 2.2: List of samples analysed**

**ANALYSIS PROGRAMME, WELL NOR : 25/4-3**

**Petroleum Geochemistry Group**  
**Research Centre Bergen**  
02-Feb-1998 12:47



Depth (m)	Lithology	Type	RockEval	RE/EXT	Extr	MPLC	Iatr	SatHC	Pyrolyse	Isot	Sat-biom	c5-20hc	Aro-hc	Vitr
2124.30	SST	COCH								1				
2128.50	SST	COCH								1				

**Table 4.1: Rock Eval pyrolysis data**

**ROCK EVAL SCREENING DATA**



Well	Depth (m)	Lithology	Type	Tmax (C)	S1(kg/t)	S2 (kg/t)	TOC (%)	HI	PI	Analysing Company
NOR : 25/7-5	1830.00	SST	DC		0.6	2.0	0.6	341	0.22	NORSK HYDRO
NOR : 25/7-5	1840.00	SST	DC		0.4	1.4	0.5	288	0.22	NORSK HYDRO
NOR : 25/7-5	1850.00	SST	DC		0.5	1.7	0.5	344	0.23	NORSK HYDRO
NOR : 25/7-5	1860.00	SST	DC		1.1	3.0	0.6	478	0.26	NORSK HYDRO
NOR : 25/7-5	1870.00	SST	DC		0.6	3.0	0.8	378	0.15	NORSK HYDRO
NOR : 25/7-5	2117.95	SST	COCH		10.0	3.5	1.3	276	0.74	NORSK HYDRO
NOR : 25/7-5	2119.10	SST	COCH		9.2	2.7	1.1	246	0.77	NORSK HYDRO
NOR : 25/7-5	2127.75	SST	COCH		7.1	0.7	0.7	101	0.91	NORSK HYDRO
NOR : 25/7-5	2128.50	SST	COCH		13.0	1.3	1.3	107	0.91	NORSK HYDRO
NOR : 25/7-5	2129.50	SST	COCH		0.8	0.8			0.51	NORSK HYDRO
NOR : 25/7-5	2130.50	SST	COCH		0.8	0.6			0.55	NORSK HYDRO
NOR : 25/7-5	2131.50	SST	COCH		7.9	1.2	0.9	141	0.86	NORSK HYDRO
NOR : 25/7-5	2132.50	SST	COCH		5.1	1.2	0.8	139	0.82	NORSK HYDRO
NOR : 25/7-5	2133.50	SST	COCH		0.3	0.9			0.23	NORSK HYDRO
NOR : 25/7-5	2133.75	SST	COCH		7.5	1.0	0.8	125	0.88	NORSK HYDRO
NOR : 25/7-5	2134.50	SST	COCH		8.9	1.0	0.9	121	0.90	NORSK HYDRO
NOR : 25/7-5	2135.50	SST	COCH		0.3	0.6			0.31	NORSK HYDRO
NOR : 25/7-5	2136.50	SST	COCH		0.2	0.8			0.18	NORSK HYDRO



**Table 5.1: Extraction and deasphalting data on extracts**

**EXTRACTION/DESPHALTING DATA (SEDIMENTS)**

Petroleum Geochemistry Group

Research Centre Bergen

02-Feb-1998

12:49



Well	Depth (m)	Lithology	Type	Rock (g)	EOM (mg)	ASP (mg)	EOM (%)	ASP (%)	EOM (ppm)	TOC (%)	EOM/TOC (%)	Analysing comp
NOR : 25/7-5	1830.00		DC	9.9	26.0	1.2	0.26	5.1	2 600	0.6	0.4	Norsk Hydro
NOR : 25/7-5	1860.00		DC	11.9	74.0	2.9	0.62	4.4	6 200	0.6	1.0	Norsk Hydro
NOR : 25/7-5	2117.95		COCH	6.3	94.0	1.5	1.50	1.8	15 000	1.3	1.2	Norsk Hydro
NOR : 25/7-5	2119.10		COCH	6.4	90.0	2.3	1.42	2.8	14 200	1.1	1.3	Norsk Hydro
NOR : 25/7-5	2128.50		COCH	3.4	56.0	0.7	1.64	1.4	16 400	1.3	1.3	Norsk Hydro
NOR : 25/7-5	2131.50		COCH	8.3	75.0	1.9	0.91	2.8	9 100	0.9	1.0	Norsk Hydro
NOR : 25/7-5	2133.75		COCH	8.4	67.0	4.0	0.80	6.6	8 000	0.8	1.0	Norsk Hydro

**Table 5.2: Deasphalting data on oil samples**



**DEASPHALTING DATA (OILS)**

Well	St.Depth (m)	En.Depth (m)	Name	OIL (mg)	ASP (mg)	ASP (%)	Analysing Company
NOR / 25/7-5	2043.00	2052.00	DST1	121.20	0.4	0.3	NORSK HYDRO
NOR / 25/7-5	2116.00	2116.00		101.90	0.7	0.7	NORSK HYDRO
NOR / 25/7-5	2126.70	2126.70	MDT	105.40	0.1	0.1	NORSK HYDRO

IATROSCAN - Calculated Weight% / SARA

Petroleum Geochemistry Group

Research Centre Bergen

02-Feb-1998



Table 5.3: Bulk separation data on deasphalted extracts and oils

COMPOSITION OF EXTRACTS/OILS WELL

Well	St.Depth (m)	En.Depth (m)	Type	Lithology	Name	Calculated Weight %			HC TOTA	ASPH%	Non-HC TOTAL	TOT HC /Non-HC	Analysing Company
						SAT	ARO	NSO					
NOR 25/7-5	1820.00	1830.00	DC	SST		6.1	0.0	88.8	6.1	5.1	93.9	0.1	NORSK HYDRO
NOR 25/7-5	1850.00	1860.00	DC	SST		4.6	0.0	91.0	4.6	4.4	95.4	0.0	NORSK HYDRO
NOR 25/7-5	2043.00	2052.00	OIL		DST1	67.3	23.9	8.5	91.2	0.3	8.8	10.3	NORSK HYDRO
NOR 25/7-5	2116.00	2116.00	OIL			64.3	24.9	10.2	89.1	0.7	10.9	8.2	NORSK HYDRO
NOR 25/7-5	2117.95	2117.95	COCH	SST		65.1	21.6	11.4	86.8	1.8	13.2	6.6	NORSK HYDRO
NOR 25/7-5	2119.10	2119.10	COCH	SST		62.7	22.3	12.2	84.9	2.8	15.1	5.6	NORSK HYDRO
NOR 25/7-5	2126.70	2126.70	OIL		MDT	73.4	19.8	6.7	93.2	0.1	6.8	13.7	NORSK HYDRO
NOR 25/7-5	2128.50	2128.50	COCH	SST		69.8	19.9	9.0	89.7	1.4	10.3	8.7	NORSK HYDRO
NOR 25/7-5	2131.50	2131.50	COCH	SST		68.2	22.3	6.7	90.5	2.8	9.5	9.5	NORSK HYDRO
NOR 25/7-5	2133.75	2133.75	COCH	SST		66.2	19.4	7.8	85.6	6.6	14.4	5.9	NORSK HYDRO



**Table 6.1: Volume composition, gas samples**

**GAS VOLUME COMPOSITION DATA NOR : 25/7-5**

Well	Name	Type	TOP (m)	BOTTOM (m)	C1(%)	C2(%)	C3(%)	iC4(%)	nC4(%)	iC5(%)	nC5(%)	CO2(%)	C1-C5(%)	Total(%)	Wetness(%)	iC4/nC4(%)
25/7-5	DST1	GAS	2043.00	2052.00	87.17	4.88	2.97	0.51	1.18	0.24	0.21	2.84	97.16	100.00	9.86	0.43
25/7-5		GAS	2116.00	2116.00	76.60	11.40	7.70	1.10	2.40	0.37	0.39	0.10	99.96	100.06	22.78	0.46
25/7-5	MDT	GAS	2126.70	2126.70	83.40	8.20	4.90	0.70	1.40	0.31	0.34	0.19	99.25	99.44	15.42	0.50

**Table 6.2: Isotope results, gas samples**

**ISOTOPE ANALYSIS NOR : 25/7-5**

**Petroleum Geochemistry Group**

**Research Centre Bergen**

02-Feb-1998

12:52



Well	Name	Type	TOP (m)	BOTTOM (m)	Meth	dDC1	Etha	Prop	Buta	IBut	13CO2	18CO2
25/7-5	DST1	GAS	2043.00	2052.00	-43.6	-201.0	-27.9	-26.1	-26.6	-25.2	8.1	-9.3
25/7-5		GAS	2116.00	2116.00	-43.4	-206.0	-28.3	-26.8	-26.7	-24.4	-8.9	-7.6
25/7-5	MDT	GAS	2126.70	2126.70	-43.6	-208.0	-28.3	-26.7	-26.4	-24.3	3.8	-9.2

Well	Depth	Benzo[a]carbazol	Benzo[c]carbazol	a/c
'25/7-5	2052	5.22	3.61	1.44
'25/7-5	2116	4.36	2.83	1.54
'25/7-5	2117.95			
'25/7-5	2119.1			
'25/7-5	2126.7	2.89	1.87	1.54
'25/7-5	2128.5	4.23	3.67	1.15
'25/7-5	2131.5	8.42	7.33	1.15
'25/7-5	2133.75	3.86	4.74	0.81
'24/9-5	0			
'24/9-6	2033.7	N.D.	N.D.	
'25/4-3	2124.3	N.D.	N.D.	
'25/4-3	2128.5	N.D.	N.D.	
Reference sample		5.09	4.01	1.27
Reference sample		6.63	5.85	1.13
Reference sample		3.03	2.19	1.38
Reference sample		5.29	3.91	1.35

Table 7.2: Benzocarbazol data

## **Appendix I**

### **Whole oil chromatograms and tabulated results of the light hydrocarbons**

Data file : K:\CAP\C5\_20ARK\1\KV35A\2575\_1.D  
 Sample Name: 25/7-5 dst1  
 Sample info:

Printed By : Signal  
 Library Data Modified : Thu, 6. Nov. 1997, 02:23:08 pm  
 Multiplier : 1.000000  
 Dilution(1/mg sample) : 0.002516  
 Uncalibrated Peaks : not reported



#	Compound	Amount ug/mg	Area	Resp. ratio	Rt. min.
1	iC5	4.25	462	1.00	7.67
2	nC5	5.74	623	1.00	8.21
3	22dm-C4	0.31	34	1.00	9.26
4	cyC5	1.96	212	1.00	10.38
5	23dm-C4	0.00	0	0.00	0.00
6	2m-C5	3.06	333	1.00	10.64
7	3m-C5	2.46	267	1.00	11.52
8	nC6	2.52	273	1.00	12.85
9	3m-cyC5-ene	0.01	1	1.00	13.83
10	22dm-C5	0.27	30	1.00	14.82
11	m-cyC5	6.06	657	1.00	15.02
12	24dm-C5	0.55	59	1.00	15.34
13	223tm-C4	0.07	8	1.00	15.83
14	Benzene	2.90	341	1.00	17.16
15	33dm-C5	0.19	21	1.00	17.74
16	cyC6	11.03	1197	1.00	18.14
17	2m-C6	0.52	57	1.00	19.11
18	23dm-C5	1.15	125	1.00	19.31
19	11dm-cyC5	0.87	95	1.00	19.63
20	3m-C6	1.83	198	1.00	20.13
21	1c.3dm-cyC5	1.40	152	1.00	20.91
22	1t.3dm-cyC5	1.31	142	1.00	21.26
23	3e-C5	0.33	36	1.00	21.41
24	1t.2dm-cyC5	2.26	245	1.00	21.61
25	iC8 (ISTD)/224tm-C5	9.12	990	1.00	21.84
26	nC7	0.42	46	1.00	23.36
27	1c.2-dm-cyC5	0.00	0	1.00	25.86
28	m-cyC6	20.73	2251	1.00	26.44
29	113tm-cyC5	0.99	108	1.00	26.93
30	e-cyC5	0.95	103	1.00	28.41
31	25dm-C6	0.37	41	1.00	28.68
32	223tm-C5/24dm-C6	0.72	78	1.00	29.04
33	1c.2t.4tm-cyC5	0.82	89	1.00	30.05
34	33dm-C6	0.23	25	1.00	30.32
35	1t.2c.3tm-cyC5	0.76	82	1.00	31.41
36	234tm-C5	0.15	16	1.00	31.96
37	Toluen/233tm-C5	13.10	1540	1.00	32.65
38	23dm-C6	0.91	99	1.00	34.12
39	2m-C7	0.17	19	1.00	35.33
40	4m-C7	0.38	41	1.00	35.62
41	3m-C7	0.33	36	1.00	36.85
42	1c.3dm-cyC6	4.67	507	1.00	36.99
43	1t.4dm-cyC6	1.75	190	1.00	37.35
44	11dm-cyC6	0.73	80	1.00	39.80
45	1t.2dm-cyC6	2.17	236	1.00	40.74
46	nC8	1.38	150	1.00	42.15
47	e-cyC6	6.16	669	1.00	48.02
48	iC9	1.39	163	1.00	49.22
49	e-benzene	2.47	290	1.00	52.16
50	m-xylene	9.75	1147	1.00	54.48
51	p-xylene	3.05	359	1.00	54.73
52	4m-C8	0.19	22	1.00	57.35
53	2m-C8	0.11	13	1.00	57.67
54	3m-C8	0.21	24	1.00	59.54
55	o-xylene	4.40	518	1.00	60.55
56	nC9	1.31	154	1.00	66.83
57	iC10	0.88	103	1.00	73.35
58	nC10	0.11	13	1.00	83.15
59	iC11	1.27	149	1.00	86.24
60	nC11	0.96	113	1.00	94.15
61	nC12	0.50	59	1.00	103.80
62	i-C13	1.96	230	1.00	105.15
63	phC6 (ISTD)	9.12	1072	1.00	107.88
64	iC14	3.81	448	1.00	110.18
65	nC13	0.38	44	1.00	111.76



Data file : K:\CAP\C5\_20ARK\1\KV35A\2575\_1.D

Sample Name: 25/7-5 dst1

Sample info:

#	Compound	Amount ug/mg	Area	Resp. ratio	Rt. min.
66	iC15	2.96	348	1.00	117.66
67	nC14	0.63	74	1.00	119.03
68	iC16	3.24	381	1.00	123.51
69	nC15	0.76	89	1.00	125.75
70	nC16	0.36	42	1.00	131.80
71	iC18	2.46	289	1.00	135.22
72	nC17	0.10	12	1.00	137.79
73	pristane	5.48	644	1.00	138.62
74	nC18	0.15	17	1.00	143.73
75	phytane	3.08	363	1.00	144.40
76	nC19	1.03	121	1.00	148.82
77	nC20	0.05	6	1.00	153.86

Internal standards for quantification:

ISTD #	Name	Amount ug
1	iC8(ISTD)/224tm-	3625.00
2	phC6(ISTD)	3625.00

=====  
\*\*\* End of Report \*\*\*

Data file : K:\CAP\C5\_20ARK\1\ORMEN1\2116.D

Sample Name: 25/7-5

Sample info:

Created By : Signal  
Library Data Modified : Wed, 23. Jul. 1997,11:27:42 am  
Multiplier : 1.000000  
Dilution(1/mg sample) : 0.002055  
Uncalibrated Peaks : not reported



#	Compound	Amount ug/mg	Area	Resp. ratio	Rt. min.
1	iC5	0.00	0	0.00	0.00
2	nC5	10.05	1059	1.00	8.05
3	22dm-C4	0.34	36	1.00	9.10
4	cyC5	1.24	131	1.00	10.22
5	23dm-C4	0.81	85	1.00	10.29
6	2m-C5	5.29	557	1.00	10.47
7	3m-C5	3.20	337	1.00	11.33
8	nC6	7.72	814	1.00	12.66
9	3m-cyC5-ene	0.00	0	1.00	13.44
10	22dm-C5	0.25	26	1.00	14.67
11	m-cyC5	5.61	592	1.00	14.88
12	24dm-C5	0.52	54	1.00	15.19
13	223tm-C4	0.06	6	1.00	15.69
14	Benzene	2.71	302	1.00	17.02
15	33dm-C5	0.17	18	1.00	17.61
16	cyC6	9.71	1023	1.00	18.00
17	2m-C6	2.89	304	1.00	18.98
18	23dm-C5	1.10	116	1.00	19.18
19	11dm-cyC5	0.79	84	1.00	19.50
20	3m-C6	3.60	379	1.00	20.01
21	1c.3dm-cyC5	1.23	130	1.00	20.78
22	1t.3dm-cyC5	1.14	120	1.00	21.14
23	3e-C5	0.30	32	1.00	21.29
24	1t.2dm-cyC5	1.96	207	1.00	21.49
25	iC8 (ISTD)/224tm-C5	7.57	798	1.00	21.71
26	nC7	3.09	326	1.00	23.25
27	1c.2-dm-cyC5	0.00	0	0.00	0.00
28	m-cyC6	16.80	1771	1.00	26.31
29	113tm-cyC5	0.85	89	1.00	26.82
30	e-cyC5	0.79	83	1.00	28.30
31	25dm-C6	0.47	49	1.00	28.57
32	223tm-C5/24dm-C6	0.63	67	1.00	28.92
33	1c.2t.4tm-cyC5	0.69	73	1.00	29.95
34	33dm-C6	0.18	19	1.00	30.22
35	1t.2c.3tm-cyC5	0.65	68	1.00	31.31
36	234tm-C5	0.14	15	1.00	31.86
37	Toluen/233tm-C5	10.91	1217	1.00	32.54
38	23dm-C6	0.76	81	1.00	34.03
39	2m-C7	2.61	275	1.00	35.26
40	4m-C7	1.17	123	1.00	35.54
41	3m-C7	2.09	220	1.00	36.74
42	1c.3dm-cyC6	3.57	377	1.00	36.90
43	1t.4dm-cyC6	1.33	140	1.00	37.26
44	11dm-cyC6	0.61	64	1.00	39.74
45	1t.2dm-cyC6	1.62	171	1.00	40.67
46	nC8	1.99	209	1.00	42.07
47	e-cyC6	4.60	485	1.00	47.95
48	iC9	1.19	133	1.00	49.17
49	e-benzene	2.01	224	1.00	52.11
50	m-xylene	7.88	880	1.00	54.41
51	p-xylene	2.46	275	1.00	54.66
52	4m-C8	1.13	127	1.00	57.32
53	2m-C8	1.09	122	1.00	57.62
54	3m-C8	1.39	155	1.00	59.54
55	o-xylene	3.56	397	1.00	60.51
56	nC9	1.08	120	1.00	66.54
57	iC10	1.53	171	1.00	73.34
58	nC10	1.51	168	1.00	83.16
59	iC11	1.79	200	1.00	86.23
60	nC11	1.49	166	1.00	94.58
61	nC12	2.44	272	1.00	103.79
62	i-C13	1.59	177	1.00	105.13
63	phC6 (ISTD)	7.57	845	1.00	107.86
64	iC14	2.43	271	1.00	110.15
65	nC13	2.79	311	1.00	111.80

Data file : K:\CAP\C5\_20ARK\1\ORMEN1\2116.D  
Sample Name: 25/7-5  
Sample info:

#	Compound	Amount ug/mg	Area	Resp. ratio	Rt. min.
66	iC15	1.82	203	1.00	117.63
67	nC14	4.85	541	1.00	119.06
68	iC16	2.58	288	1.00	123.48
69	nC15	6.07	677	1.00	125.78
70	nC16	5.46	609	1.00	132.06
71	iC18	1.66	185	1.00	135.19
72	nC17	4.67	521	1.00	137.98
73	pristane	3.12	348	1.00	138.58
74	nC18	4.03	450	1.00	143.58
75	phytane	2.31	258	1.00	144.37
76	nC19	4.06	453	1.00	148.91
77	nC20	3.09	345	1.00	153.99

Internal standards for quantification:

ISTD #	Name	Amount ug
1	iC8(ISTD)/224tm-	3685.00
2	phC6(ISTD)	3685.00

=====  
\*\*\* End of Report \*\*\*

Data file : K:\CAP\C5\_20ARK\1\ORMEN1\2126\_7.D

Sample Name: 25/7-5

Sample info:

Created By : Signal  
Calib. Data Modified : Wed, 23. Jul. 1997, 11:27:42 am  
Multiplier : 1.000000  
Dilution(1/mg sample) : 0.002055  
Uncalibrated Peaks : not reported



#	Compound	Amount ug/mg	Area	Resp. ratio	Rt. min.
1	iC5	0.00	0	0.00	0.00
2	nC5	12.09	1109	1.00	8.05
3	22dm-C4	0.42	39	1.00	9.10
4	cyC5	1.58	145	1.00	10.22
5	23dm-C4	1.00	92	1.00	10.28
6	2m-C5	6.32	580	1.00	10.47
7	3m-C5	3.92	360	1.00	11.32
8	nC6	8.83	810	1.00	12.65
9	3m-cyC5-ene	0.00	0	1.00	13.46
10	22dm-C5	0.33	31	1.00	14.66
11	m-cyC5	7.25	665	1.00	14.87
12	24dm-C5	0.66	60	1.00	15.18
13	223tm-C4	0.08	8	1.00	15.68
14	Benzene	3.62	356	1.00	17.01
15	33dm-C5	0.23	21	1.00	17.60
16	cyC6	12.75	1169	1.00	17.99
17	2m-C6	2.92	268	1.00	18.97
18	23dm-C5	1.36	125	1.00	19.17
19	11dm-cyC5	1.00	91	1.00	19.49
20	3m-C6	4.29	393	1.00	19.99
21	1c.3dm-cyC5	1.59	146	1.00	20.77
22	1t.3dm-cyC5	1.48	135	1.00	21.13
23	3e-C5	0.38	35	1.00	21.27
24	1t.2dm-cyC5	2.53	232	1.00	21.48
25	iC8 (ISTD) / 224tm-C5	7.57	694	1.00	21.69
26	nC7	3.18	292	1.00	23.23
27	1c.2-dm-cyC5	0.00	0	0.00	0.00
28	m-cyC6	22.81	2092	1.00	26.30
29	113tm-cyC5	1.09	100	1.00	26.79
30	e-cyC5	1.05	97	1.00	28.28
31	25dm-C6	0.61	56	1.00	28.55
32	223tm-C5/24dm-C6	0.83	76	1.00	28.91
33	1c.2t.4tm-cyC5	0.89	81	1.00	29.93
34	33dm-C6	0.25	23	1.00	30.20
35	1t.2c.3tm-cyC5	0.82	75	1.00	31.30
36	234tm-C5	0.16	15	1.00	31.85
37	Toluen/233tm-C5	14.89	1466	1.00	32.53
38	23dm-C6	0.99	91	1.00	34.01
39	2m-C7	1.81	166	1.00	35.24
40	4m-C7	1.33	122	1.00	35.52
41	3m-C7	2.01	184	1.00	36.72
42	1c.3dm-cyC6	5.06	464	1.00	36.89
43	1t.4dm-cyC6	1.88	172	1.00	37.25
44	11dm-cyC6	0.78	71	1.00	39.72
45	1t.2dm-cyC6	2.31	211	1.00	40.65
46	nC8	2.15	197	1.00	42.06
47	e-cyC6	6.51	597	1.00	47.94
48	iC9	1.46	143	1.00	49.15
49	e-benzene	2.70	266	1.00	52.09
50	m-xylene	10.46	1029	1.00	54.39
51	p-xylene	0.00	0	0.00	0.00
52	4m-C8	0.70	69	1.00	57.60
53	2m-C8	0.18	18	1.00	57.93
54	3m-C8	0.00	0	0.00	0.00
55	o-xylene	0.00	0	0.00	0.00
56	nC9	1.37	135	1.00	66.78
57	iC10	0.35	35	1.00	73.56
58	nC10	0.11	10	1.00	83.48
59	iC11	0.00	0	0.00	0.00
60	nC11	0.83	82	1.00	94.90
61	nC12	0.71	70	1.00	103.89
62	i-C13	2.16	213	1.00	105.12
63	phC6 (ISTD)	7.57	745	1.00	107.84
64	iC14	3.96	390	1.00	110.14
65	nC13	1.27	125	1.00	111.79

Data file : K:\CAP\C5\_20ARK\1\ORMEN1\2126\_7.D  
Sample Name: 25/7-5  
Sample info:

#	Compound	Amount ug/mg	Area	Resp. ratio	Rt. min.
66	iC15	2.97	292	1.00	117.63
67	nC14	3.21	316	1.00	119.05
68	iC16	4.12	406	1.00	123.47
69	nC15	4.70	463	1.00	125.76
70	nC16	4.27	420	1.00	132.04
71	iC18	2.77	272	1.00	135.19
72	nC17	3.52	347	1.00	137.96
73	pristane	5.87	577	1.00	138.59
74	nC18	3.20	315	1.00	143.57
75	phytane	3.17	312	1.00	144.36
76	nC19	3.50	345	1.00	148.90
77	nC20	2.62	257	1.00	153.98

Internal standards for quantification:

ISTD #	Name	Amount ug
1	iC8 (ISTD)/224tm-	3685.00
2	phC6 (ISTD)	3685.00

=====  
\*\*\* End of Report \*\*\*

Data file : K:\CAP\C5\_20ARK\1\ORMEN1\24\_9\_5.D

Sample Name: 24/9-5

Sample info:

Created By : Signal  
Calib. Data Modified : Wed, 23. Jul. 1997, 11:27:42 am  
Multiplier : 1.000000  
Dilution(1/mg sample) : 0.002055  
Uncalibrated Peaks : not reported



#	Compound	Amount ug/mg	Area	Resp. ratio	Rt. min.
1	iC5	0.00	0	1.00	7.80
2	nC5	3.72	381	1.00	8.05
3	22dm-C4	0.30	31	1.00	9.10
4	cyC5	1.07	110	1.00	10.22
5	23dm-C4	0.80	82	1.00	10.28
6	2m-C5	2.86	292	1.00	10.47
7	3m-C5	2.49	255	1.00	11.32
8	nC6	1.93	197	1.00	12.65
9	3m-cyC5-ene	0.00	0	1.00	13.43
10	22dm-C5	0.31	32	1.00	14.66
11	m-cyC5	6.33	648	1.00	14.87
12	24dm-C5	0.62	63	1.00	15.19
13	223tm-C4	0.08	8	1.00	15.68
14	Benzene	0.09	9	1.00	17.02
15	33dm-C5	0.22	23	1.00	17.60
16	cyC6	11.74	1201	1.00	17.99
17	2m-C6	0.49	50	1.00	18.97
18	23dm-C5	1.35	138	1.00	19.17
19	11dm-cyC5	1.03	106	1.00	19.49
20	3m-C6	1.82	186	1.00	20.00
21	1c.3dm-cyC5	1.58	161	1.00	20.77
22	1t.3dm-cyC5	1.46	150	1.00	21.13
23	3e-C5	0.40	41	1.00	21.28
24	1t.2dm-cyC5	2.59	265	1.00	21.48
25	iC8 (ISTD) / 224tm-C5	7.57	775	1.00	21.70
26	nC7	0.30	31	1.00	23.23
27	1c.2-dm-cyC5	0.00	0	0.00	0.00
28	m-cyC6	22.70	2323	1.00	26.31
29	113tm-cyC5	1.18	121	1.00	26.80
30	e-cyC5	1.03	105	1.00	28.29
31	25dm-C6	0.33	33	1.00	28.56
32	223tm-C5/24dm-C6	0.84	86	1.00	28.91
33	1c.2t.4tm-cyC5	0.97	100	1.00	29.93
34	33dm-C6	0.28	28	1.00	30.20
35	1t.2c.3tm-cyC5	0.92	94	1.00	31.29
36	234tm-C5	0.19	20	1.00	31.84
37	Toluen/233tm-C5	0.18	20	1.00	32.49
38	23dm-C6	1.10	112	1.00	34.01
39	2m-C7	0.15	16	1.00	35.23
40	4m-C7	0.29	30	1.00	35.52
41	3m-C7	0.00	0	0.00	0.00
42	1c.3dm-cyC6	5.56	569	1.00	36.88
43	1t.4dm-cyC6	1.95	199	1.00	37.25
44	11dm-cyC6	0.87	89	1.00	39.72
45	1t.2dm-cyC6	2.46	252	1.00	40.65
46	nC8	1.56	160	1.00	42.08
47	e-cyC6	6.90	706	1.00	47.94
48	iC9	1.76	192	1.00	49.15
49	e-benzene	0.00	0	0.00	0.00
50	m-xylene	0.11	12	1.00	54.62
51	p-xylene	0.00	0	0.00	0.00
52	4m-C8	0.07	7	1.00	57.60
53	2m-C8	0.21	22	1.00	57.94
54	3m-C8	0.04	4	1.00	59.80
55	o-xylene	0.59	64	1.00	60.59
56	nC9	1.54	168	1.00	66.78
57	iC10	0.42	46	1.00	73.56
58	nC10	0.11	12	1.00	83.48
59	iC11	0.00	0	0.00	0.00
60	nC11	0.87	94	1.00	94.89
61	nC12	0.84	91	1.00	103.89
62	i-C13	1.67	183	1.00	105.12
63	phC6 (ISTD)	7.57	825	1.00	107.85
64	iC14	4.85	529	1.00	110.15
65	nC13	0.70	76	1.00	111.78

Data file : K:\CAP\C5\_20ARK\1\ORMEN1\24\_9\_5.D

Sample Name: 24/9-5

Sample info:

#	Compound	Amount ug/mg	Area	Resp. ratio	Rt. min.
66	iC15	3.37	368	1.00	117.63
67	nC14	1.69	185	1.00	119.04
68	iC16	4.17	455	1.00	123.48
69	nC15	2.31	252	1.00	125.75
70	nC16	1.84	200	1.00	132.03
71	iC18	2.93	320	1.00	135.19
72	nC17	1.22	133	1.00	137.95
73	pristane	6.11	666	1.00	138.58
74	nC18	1.24	135	1.00	143.56
75	phytane	3.50	381	1.00	144.37
76	nC19	0.95	104	1.00	148.79
77	nC20	1.08	118	1.00	153.97

Internal standards for quantification:

ISTD #	Name	Amount ug
1	iC8 (ISTD)/224tm-	3685.00
2	phC6 (ISTD)	3685.00

=====  
\*\*\* End of Report \*\*\*

## **Appendix II**

### **Gas chromatograms and tabulated results of saturated hydrocarbons**



#	Rt.min.	Signal	Compound	Area	Amount
FID					
Internal standards (if added):					
1)	13.39	GC1	C12D26	8265704	3.9
6)	25.73	GC1	C16D34	12443028	3.9
11)	36.01	GC1	C20D24	16864081	3.8
19)	44.64	GC1	C24D42	18496864	3.9
28)	55.30	GC1	C30D62	7982728	1.7
2)	10.68	GC1	nC11	474461	
3)	13.95	GC1	nC12	1770200	
4)	17.23	GC1	nC13	2653542	
5)	20.41	GC1	nC14	2210611	
7)	22.32	GC1	iC16	730323	0.2
8)	23.45	GC1	nC15	1192764	0.4
9)	26.36	GC1	nC16	730681	0.2
10)	27.72	GC1	iC18	311574	0.1
12)	29.12	GC1	nC17	542643	0.1
13)	29.28	GC1	pristane	694216	0.2
14)	31.75	GC1	nC18	372947	0.1
15)	32.00	GC1	phytane	367061	0.1
16)	34.27	GC1	nC19	307066	0.1
17)	36.68	GC1	nC20	244208	0.1
18)	38.98	GC1	nC21	308836	0.1
20)	41.18	GC1	nC22	245579	0.1
21)	43.30	GC1	nC23	247139	0.1
22)	45.33	GC1	nC24	221768	0.0
23)	47.29	GC1	nC25	229510	0.0
24)	49.17	GC1	nC26	199464	0.0
25)	50.99	GC1	nC27	184217	0.0
26)	52.75	GC1	nC28	129717	0.0
27)	54.45	GC1	nC29	198026	0.0
29)	56.10	GC1	nC30	112415	0.0
30)	57.69	GC1	nC31	167165	0.0
31)	59.23	GC1	nC32	76304	0.0
32)	60.73	GC1	nC33	81605	0.0
33)	62.19	GC1	nC34	57044	0.0
34)	63.76	GC1	nC35	45954	0.0

### Saturated hydrocarbons

GC/FID detection HP-6890

Compound data and ratios



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: **S1830.D**  
Sample name: **25/7-5 1830m sat**  
Data File Path: C:\HPCHEM\1\DATA\ISA315H3D\  
Misc. info.:

Vial no.: 3  
Method: MSD\_S\_D  
Operator:  
Date: Thu Nov 13 19:36:17 1997

Response curve y = ax  
Response factor equally 1.0

Ratios:	Area	Amount
Pr/nC17	1.28	1.28
Ph/nC18	0.98	0.98
(Pr/nC17)/(Ph/nC18)	1.30	1.30
Pr/Ph	1.89	1.89
nC17/(nC17+nC27)	0.75	0.76
CPI-1	1.34	1.34
CPI-2 (2*nC27/(nC26+nC27))	0.96	0.96

#	Rt.min.	Signal	Compound	Area	Amount
					ug/mg
Internal standards (if added):					
1)	13.40	GC1	C12D26	8723453	2.7
6)	25.75	GC1	C16D34	18610492	2.7
11)	36.04	GC1	C20D24	- 24429889	2.7
19)	44.67	GC1	C24D42	27660035	2.7
28)	55.32	GC1	C30D62	3393898	0.3
2)	10.69	GC1	nC11	111175	
3)	13.95	GC1	nC12	275134	
4)	17.22	GC1	nC13	554349	
5)	20.40	GC1	nC14	794479	
7)	22.31	GC1	iC16	314608	0.0
8)	23.45	GC1	nC15	718811	0.1
9)	26.36	GC1	nC16	633801	0.1
10)	27.72	GC1	iC18	290767	0.0
12)	29.12	GC1	nC17	642676	0.1
13)	29.29	GC1	pristane	792754	0.1
14)	31.76	GC1	nC18	537914	0.1
15)	32.01	GC1	phytane	453812	0.0
16)	34.27	GC1	nC19	455661	0.0
17)	36.68	GC1	nC20	346273	0.0
18)	38.98	GC1	nC21	378139	0.0
20)	41.18	GC1	nC22	367409	0.0
21)	43.30	GC1	nC23	405991	0.0
22)	45.34	GC1	nC24	350727	0.0
23)	47.29	GC1	nC25	295962	0.0
24)	49.17	GC1	nC26	240088	0.0
25)	50.99	GC1	nC27	181348	0.0
26)	52.75	GC1	nC28	163676	0.0
27)	54.45	GC1	nC29	202402	0.0
29)	56.09	GC1	nC30	147458	0.0
30)	57.69	GC1	nC31	179866	0.0
31)	59.23	GC1	nC32	84823	0.0
32)	60.73	GC1	nC33	106544	0.0
33)	62.18	GC1	nC34	71523	0.0
34)	63.76	GC1	nC35	74673	0.0

### Saturated hydrocarbons

GC/FID detection HP-6890

#### Compound data and ratios



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: **S1860.D**  
Sample name: **25/7-5 1860m sat**  
Data File Path: **C:\HPCHEM\1\DATA\ISA315H3D\**  
Misc. info.:

Vial no.: **4**  
Method: **MSD\_S\_D**  
Operator:  
Date: **Thu Nov 13 21:04:59 1997**

Response curve  $y = ax$   
Response factor equally 1.0

Ratios:	Area	Amount
Pr/nC17	1.23	1.23
Ph/nC18	0.84	0.84
(Pr/nC17)/(Ph/nC18)	1.46	1.46
Pr/Ph	1.75	1.75
nC17/(nC17+nC27)	0.78	0.80
CPI-1	1.15	1.15
CPI-2 (2*nC27/(nC26+nC27))	0.86	0.86

#	Rt.min.	Signal	Compound	Area	Amount
			FID	ug/mg	
Internal standards (if added):					
1)	13.37	GC1	C12D26	3311850	3.9
6)	25.68	GC1	C16D34	4622637	3.9
11)	35.95	GC1	C20D24	5223566	3.9
19)	44.56	GC1	C24D42	5073520	4.0
28)	55.26	GC1	C30D62	2292820	1.8
2)	10.68	GC1	nC11	1222899	
3)	13.94	GC1	nC12	1730652	
4)	17.22	GC1	nC13	2433702	
5)	20.42	GC1	nC14	4744349	
7)	22.32	GC1	iC16	2458790	2.1
8)	23.49	GC1	nC15	6676838	5.7
9)	26.39	GC1	nC16	6651043	5.6
10)	27.74	GC1	iC18	2263190	1.9
12)	29.16	GC1	nC17	6186161	4.6
13)	29.32	GC1	pristane	3920191	2.9
14)	31.79	GC1	nC18	5165271	3.8
15)	32.03	GC1	phytane	3128330	2.3
16)	34.31	GC1	nC19	4619253	3.4
17)	36.71	GC1	nC20	4200572	3.1
18)	39.00	GC1	nC21	3653362	2.7
20)	41.20	GC1	nC22	3342929	2.6
21)	43.32	GC1	nC23	2983455	2.3
22)	45.35	GC1	nC24	2990939	2.3
23)	47.30	GC1	nC25	2641936	2.1
24)	49.19	GC1	nC26	2160151	1.7
25)	51.00	GC1	nC27	1762164	1.4
26)	52.76	GC1	nC28	1598004	1.2
27)	54.46	GC1	nC29	1447221	1.1
29)	56.10	GC1	nC30	1231024	1.0
30)	57.69	GC1	nC31	1126167	0.9
31)	59.24	GC1	nC32	976427	0.8
32)	60.73	GC1	nC33	775352	0.6
33)	62.19	GC1	nC34	1342169	1.0
34)	63.76	GC1	nC35	657224	0.5

### Saturated hydrocarbons

GC/FID detection HP-6890

#### Compound data and ratios



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: **S2116.D**  
 Sample name: **25/7-5 2116m sat**  
 Data File Path: C:\HPCHEM\1\DATA\ELIN\2\  
 Misc. info.:  
 Vial no.: **3**  
 Method: **MSD\_S\_D**  
 Operator:  
 Date: **Wed Dec 03 19:03:21 1997**

Response curve y = ax  
 Response factor equally 1.0

Ratios:	Area	Amount
Pr/nC17	0.63	0.63
Ph/nC18	0.61	0.61
(Pr/nC17)/(Ph/nC18)	1.05	1.05
Pr/Ph	1.25	1.25
nC17/(nC17+nC27)	0.78	0.77
CPI-1	1.02	1.02
CPI-2 (2*nC27/(nC26+nC27))	0.90	0.90

#	Rt.min.	Signal	Compound	Area	Amount
FID				ug/mg	
Internal standards (if added):					
1)	13.39	GC1	C12D26	3375290	3.3
6)	25.69	GC1	C16D34	4606602	3.3
11)	35.95	GC1	C20D24	4570641	3.3
19)	44.56	GC1	C24D42	4669282	3.4
28)	55.25	GC1	C30D62	2026100	1.5
2)	10.67	GC1	nC11	368065	
3)	14.00	GC1	nC12	325275	
4)	17.27	GC1	nC13	443481	
5)	20.54	GC1	nC14	919554	
7)	22.34	GC1	iC16	3641757	2.6
8)	23.47	GC1	nC15	513753	0.4
9)	26.30	GC1	nC16	459662	0.3
10)	27.76	GC1	iC18	3663851	2.6
12)	29.14	GC1	nC17	371341	0.3
13)	29.35	GC1	pristane	8650665	6.2
14)	31.83	GC1	nC18	309952	0.2
15)	32.05	GC1	phytane	4642270	3.3
16)	34.26	GC1	nC19	240446	0.2
17)	36.61	GC1	nC20	450868	0.3
18)	38.96	GC1	nC21	108162	0.1
20)	41.12	GC1	nC22	87351	0.1
21)	43.23	GC1	nC23	140087	0.1
22)	45.41	GC1	nC24	175867	0.1
23)	47.27	GC1	nC25	267987	0.2
24)	49.26	GC1	nC26	231018	0.2
25)	50.89	GC1	nC27	150361	0.1
26)	52.82	GC1	nC28	101213	0.1
27)	54.48	GC1	nC29	114227	0.1
29)	56.11	GC1	nC30	117875	0.1
30)	57.69	GC1	nC31	103845	0.1
31)	59.21	GC1	nC32	77526	0.1
32)	60.66	GC1	nC33	151713	0.1
33)	62.17	GC1	nC34	227939	0.2
34)	63.77	GC1	nC35	210206	0.2

### Saturated hydrocarbons

GC/FID detection HP-6890

Compound data and ratios



Norsk Hydro E&P Research Centre, Bergen, Norway  
Petroleum Geochemistry Laboratories

Data file name: S2052.D  
Sample name: 25/7-5 2052m sat  
Data File Path: K:\CAM\GEOK\JEM\HPCHEM\W95\DATA\ISA351110  
Misc. info.:

Vial no.: 12  
Method: MSD\_S\_D  
Operator:  
Date: Thu Oct 30 12:04:54 1997

Response curve y = ax  
Response factor equally 1.0

Ratios:	Area	Amount
Pr/nC17	23.30	23.30
Ph/nC18	14.98	14.98
(Pr/nC17)/(Ph/nC18)	1.56	1.56
Pr/Ph	1.86	1.86
nC17/(nC17+nC27)	0.71	0.71
CPI-1	1.11	1.11
CPI-2 (2*nC27/(nC26+nC27))	0.79	0.79