
Wireline Run 1C

The primary objective of the MDT run was to obtain a fluid sample. Following the problems encountered with differential sticking in well 6407/9-9T2, which preceded this well, the MDT tool length was kept to a minimum. The pumpout module was omitted and it was planned to clean-up the sample by dumping into a 6 gallon chamber. This chamber, however, did not open due to an electronics failure. The first sample was taken at 1660.4 m MDRKB (corrected for depth-shift error) into a 2.3/4 gallon chamber. Sampling occurred extremely slowly, so after almost an hour it was aborted and an improved permeability interval sought. Fluid was sampled into a 1 gallon chamber at 1660.7 m MDRKB (corrected for depth-shift error). Once again, sampling occurred extremely slowly despite a recorded mobility of 249 md/cp and a high porosity indicated from the density log. This suggests potential plugging of the probe due to the unconsolidated nature of the sandstone. A gravel pack was not used for the probe due to its failure in well 6407/9-9T2, but a filter was used instead.



All depths have been corrected for the depth-shift error of 1.2m

Test No.	Depth MDRT (m)	Depth TVDSS (m)	Initial Hydrostatic Pressure (BARS)	Formation Pressure (BARS)	Final Hydrostatic Pressure (BARS)	Temp. (°C)	Remarks/Permeability
1	1660.4	1637.0	222.44	181.419	221.46	62.9	NB: Drawdown limited to 90 bar, 20cc pretest volume.
			222.43	182.460	222.45		Mobility – 57 md/cp No overpull on pulling off station
2(s)	1660.4	1637.0	221.48	181.423	-	63.4	Mobility – 39 md/cp, sample point. 6 gallon chamber fails to open. 2 ¾ gallon chamber filling slowly – abort sampling after 57 mins.
			222.46	181.820	-		
3	1660.5	1637.1	221.48	181.470	-	65.4	Mobility – 52 md/cp. Abort test and move probe to look for better mobility.
			222.46	182.490	-		
4 (s)	1660.7	1637.3	221.49	181.483	-	65.4	Mobility – 249 md/cp. Attempt to take sample. Flow into 2 ¾ gallon chamber for 52 mins. Fill 1 gallon for 1hr 17mins. Abort sampling.
			222.53	182.520	-		
5	1665.3	1641.9	221.98	181.930	221.98	66.9	Mobility – 2009 md/cp.
			222.93	182.940	222.95		
6	1671.3	1647.9	222.78	182.522	222.77	66.9	Mobility – 901 md/cp.
			223.76	183.530	223.74		
7	1678.0	1654.6	223.65	183.184	223.64	67	Mobility – 1128 md/cp.
			224.62	184.190	224.60		
8	1686.0	1662.6	224.71	183.977	224.68	66.9	Mobility – 2137 md/cp.
			225.70	184.990	225.67		
9	1690.6	1667.2	225.28	184.433	225.28	66.9	Mobility – 1377 md/cp.
			226.26	185.440	226.28		
10	1765.6	1742.2	235.12	174.851	235.09	67.6	Mobility – 1889.7 md/cp.
			236.06	175.840	236.05		
11	1767.3	1743.9	235.31	175.010	235.30	68.5	Mobility – 1540.5 md/cp.
			236.26	176.010	236.25		
12	1771.8	1748.4	235.90	175.454	235.90	69.2	Mobility – 1288.1 mp/cp.
			236.82	176.460	236.87		
13	1716.3	1692.9	228.52	186.925	228.51	69.5	Mobility – 1119.6 md/cp.
			229.54	187.970	229.55		
14	1660.6	1637.2	221.15	181.403	221.17	68.8	Mobility – 27.7 md/cp.
			222.20	182.470	222.19		

a) CQG Gauge b) Strain gauge (s) – Sample point.



All depths have been corrected for the depth-shift error.

Test No.	Depth MDRT (m)	Depth TVDSS (m)	Initial Hydrostatic Pressure (BARS)	Formation Pressure (BARS)	Final Hydrostatic Pressure (BARS)	Temp. (°C)	Remarks/Permeability
2 (s)	1660.4	1637.0	221.48	181.423	-	63.4	Mobility – 39 md/cp, sample point. 6 gallon chamber fails to open. 2 ¾ gallon chamber filling slowly – abort sampling after 57 mins.
			222.46	181.820	-		
4 (s)	1660.7	1637.3	221.49	181.483	-	65.4	Mobility – 249 md/cp. Attempt to take sample. Flow into 2 ¾ gallon chamber for 52 mins. Fill 1 gallon for 1hr 17mins. Abort sampling.
			222.53	182.520	-		
Sequence of Events: Sample No 1 @ 1660.4 & 1660.7 m Run 1C							Sample Recovery Details:
Date & time 12/07/99							
1030	Prepare to take first Pretest point at 1660.4 m.						<p>2 3/4 Gallon Chamber: Surface Pressure: Chamber Pressure 150psi. Recovered: Approximately 0.4 cuft of gas and 2.8 litres of fluid. Gas Analysis: Not enough for analysis Chromatograph Analysis: Not enough for analysis Fluid Analysis: Total fluid recovered from tool chamber was 2.8 litres. Comprised approximately 0.5 litres oil and 2.30 litres of mud filtrate/water. Oil: The fluid was dark brown & gave a bright yellow direct fluorescence and a bright blue white cut. It appeared to be contaminated with mud filtrate and low gravity solids.</p> <p>1 Gallon Chamber: Surface Pressure: Chamber Pressure 150psi. Recovered: Approximately 0.03 cuft of gas and 0.324 litres of fluid. Gas Analysis: Not enough for analysis Chromatograph Analysis: Not enough for analysis Fluid Analysis: Total fluid recovered from tool chamber was 0.324 litres. Comprised approximately 0.03 litres oil and 0.294 litres of mud filtrate/water. Oil: Similar to description above.</p> <p>6 Gallon Chamber: No sample was recovered at surface. Observed abnormally low hydraulic oil pressure on valve which opens chamber for sampling. This appeared to be the reason for failure.</p>
1043	Move tool to check overpull – none observed. Check correlation whilst getting back to depth – Okay						
1045	Start pretest at 1660.4 m – 39 md/cp.						
1055	Open 6 Gallon sample chamber. Only 3-4 bar drawdown. No indication that chamber is filling.						
1104	Closed 6 Gallon chamber – 181.416 bar.						
1108	Open 2 ¾ gallon chamber. Good indications of filling. Increase drawdown in stages in an attempt to increase filling rate.						
1205	Stopped filling chamber – sample filling very slowly, abort test to look for improved permeability.						
1207	Retract probe. Perform depth correlation – subtract 0.1 m.						
1218	Start pretests to check mobility. Good mobility observed at 1660.7 m – 249 md/cp.						
1233	Begin sampling at 1660.7 m, attempt to open 6 gallon chamber - chamber fails to open.						
1238	Open 2 ¾ Gallon chamber. Vary drawdown to attempt increase filling rate.						
1330	Close 2-3/4 Gallon chamber (not full).						
1331	Opened 1 Gallon chamber – appears to be filling slowly.						
1448	Stopped sampling and closed chamber. (Chamber not full).						
1454	Retract probe and move off point – no overpull.						

a) CQG Gauge b) Strain Gauge.

1.2 Casing Summary

Size inch	Weight lbs/ft	Grade	Connection	Casing shoe mBDF	Comments
30"	310	X-52	SL-60	373	5 joints including wellhead joint
9 5/8"	53.5	P-110	NSCC	955.6	String run on wellhead with 20" extension X/O to 9 5/8".

1.3 Mud

Section	Details
36" top hole:	Drilled Riserless, Sea water with Bentonite Hi-Vis pills as required. 1.20sg Hi-Vis mud left in hole for casing run
12.1/4" intermediate hole:	Drilled Riserless, Sea water with Bentonite Hi-Vis pills as required. 1.20sg Hi-Vis mud left in hole for casing run
8.1/2" production hole:	BARASILC (sodium silicate) mud at 1.35sg, with Baracarb 25+50 added at 10-15 ppb to reduce differential sticking risk.
Abandonment:	1.35sg mud left in hole, with seawater above top cement plug.

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Geochemical investigation of a crude oil sample from
well 6407/12-1, Norway

by

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Sponsor: Shell Risavika

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Correlation table well 6407/12-1, Norway

	6407/12-01 1661.6-1661.9 m S193382/1	6407/X-X unspecified Draugen oil S188084/1
OMC	8743	7617
API	36.5	37.6
Sulphur (%)	0.2	0.2
Vanadium (ppm)	1.0	1.0
Nickel (ppm)	3.0	1.0
Pristane/Phytane	2.00	1.97
Pristane/n-C17	0.96	0.94
Phytane/n-C18	0.55	0.53
Gasoline fraction (%)	13.6	16.8
C7 ALKANES:		
normal	49	48
monobranched	39	41
polybranched	12	11
C7 ALKANES/CYCLOALKANES:		
normal	22	21
cycloalkanes	56	55
branched	22	24
C7 ALKANES/AROMATICS:		
alkanes	42	43
cycloalkanes	55	53
aromatics	3	4
C7 VR/E	0.87	0.89
AROMATIC FRACTION:		
MNR	1.36	1.35
DNR-1	2.35	3.49
TNR-1	0.68	0.67
TNR-2	1.69	1.58
MPI-1	0.66	0.61
MPI-2	0.67	0.63
F-1	0.44	0.43
F-2	0.22	0.22
Naphthalene VR/E	0.82	0.86
MONOAROMATIC STEROIDS:		
C27	27	27
C28	44	43
C29	29	30
C28TA/(C29MA+C28TA)	0.61	0.60
MA(I)/MA(I+II)	0.18	0.17
TA(I)/TA(I+II)	0.17	0.17
MA C27 V/(I+V) 20S	0.78	0.78
TA C26 20S/C28 20S	0.54	0.53
TA C27 20R/C28 20R	1.12	1.13
TA Dinosteroid index	0.78	0.80
STERANES/TRITERPANES:		
iso steranes	28	28
rearranged steranes	58	59
triterpanes	14	13
STERANE CONVERSION:		
iso steranes	33	34
rearranged steranes	47	48
normal steranes	20	18
STERANE CARBON NUMBERS:		
C27 steranes	30	31
C28 steranes	30	32
C29 steranes	40	37
3R/(3R+5R) terpanes	0.12	0.10
Ts/Tm	0.96	0.98
20S/20(R+S) C29 steranes	0.59	0.55
Iso/(iso+normal) C29 steranes	0.59	0.63
Biomarker VR/E	0.73	0.72
CARBON ISOTOPE RATIOS (per mil):		
total oil	-28.7	-28.6
saturates	-29.1	-29.0
aromatics	-28.0	-27.8

Correlation table well 6407/12-1, Norway

	6407/09-01 1631-1637 m S105770/0	6407/09-02 1626-1632 m S114697/0	6407/09-02 1651-1657 m S114701/0	6407/09-03 1633.5-1644.5 m S114702/0	6407/09-04 1662-1667 m S114704/0	6407/09-05 1654-1661 m S117942/0
OMC	3367	3498	3565	3566	3567	3720
API	42.2	37.4	39.6	40.7	39.6	41.4
Sulphur (%)	0.3	0.2	0.3	0.4	0.3	0.2
Vanadium (ppm)	1.0	1.0	1.0	1.0	1.0	1.0
Nickel (ppm)	1.0	1.0	1.0	1.0	1.0	1.0
Pristane/Phytane	2.23	2.13	2.08	2.08	2.07	1.98
Pristane/n-C17	1.06	0.98	0.96	0.95	1.00	0.98
Phytane/n-C18	0.55	0.52	0.53	0.54	0.55	0.54
Gasoline fraction (%)	17.6	11.4	13.3	13.4	12.3	17.8
C7 ALKANES:						
normal	49	50	49	50	45	50
monobranched	40	40	41	39	44	39
polybranched	11	10	10	11	11	11
C7 ALKANES/CYCLOALKANES:						
normal	20	20	20	21	17	22
cycloalkanes	58	59	59	59	63	56
branched	22	21	21	20	20	22
C7 ALKANES/AROMATICS:						
alkanes	40	39	39	39	36	42
cycloalkanes	56	56	56	56	59	54
aromatics	4	5	5	5	5	4
C7 VR/E	0.87	0.85	0.86	0.86	0.86	0.87
AROMATIC FRACTION:						
MNR	no data	no data	no data	no data	no data	1.38
DNR-1	no data	no data	no data	no data	no data	2.58
TNR-1	no data	no data	no data	no data	no data	0.71
TNR-2	no data	no data	no data	no data	no data	1.96
MPI-1	no data	no data	no data	no data	no data	0.61
MPI-2	no data	no data	no data	no data	no data	0.63
F-1	no data	no data	no data	no data	no data	0.45
F-2	no data	no data	no data	no data	no data	0.23
Naphthalene VR/E	no data	no data	no data	no data	no data	0.83
MONOAROMATIC STEROIDS:						
C27	no data	no data	no data	no data	no data	no data
C28						
C29						
C28TA/(C29MA+C28TA)	no data	no data	no data	no data	no data	no data
MA(I)/MA(I+II)	no data	no data	no data	no data	no data	no data
TA(I)/TA(I+II)	no data	no data	no data	no data	no data	no data
MA C27 V/(I+V) 20S	no data	no data	no data	no data	no data	no data
TA C26 20S/C28 20S	no data	no data	no data	no data	no data	no data
TA C27 20R/C28 20R	no data	no data	no data	no data	no data	no data
TA Dinosteroid index	no data	no data	no data	no data	no data	no data
STERANES/TRITERPANES:						
iso steranes	30	26	30	29	26	29
rearranged steranes	50	51	55	49	49	56
triterpanes	20	23	15	22	25	15
STERANE CONVERSION:						
iso steranes	41	39	37	42	40	36
rearranged steranes	47	50	46	47	50	47
normal steranes	12	11	17	11	10	17
STERANE CARBON NUMBERS:						
C27 steranes	29	30	28	33	28	29
C28 steranes	28	28	34	27	30	33
C29 steranes	43	42	38	40	42	38
3R/(3R+5R) terpanes	0.00	0.02	0.12	0.07	0.00	0.12
Ts/Tm	0.80	1.97	1.01	1.52	2.43	0.97
20S/20(R+S) C29 steranes	0.63	0.73	0.62	0.62	0.77	0.59
Iso/(iso+normal) C29 steranes	0.70	0.74	0.63	0.75	0.76	0.65
Biomarker VR/E	not detectable	0.53	0.74	0.68	not detectable	0.74
CARBON ISOTOPE RATIOS (per mil):						
total oil	-28.6	-28.7	-28.7	-28.7	-28.7	-28.6
saturates	-	-	-	-	-	-29.1
aromatics	-	-	-	-	-	-28.2

**Summary of the geochemical data of the oil sample from
well 6407/12-01 (1661.6-1661.9 m), Norway**

Gravity and Gross Composition

API gravity (degrees) :	36.5
Specific gravity (g/ml) :	0.842
Viscosity (centipoise) :	4.47
Pourpoint (degrees C) :	-15
Total Acid Number (mgKOH/g) :	0.26
Wax content (%) :	no data

Gross Composition (wt%)

Weight lost on topping :	40.5
Saturates :	55
Aromatics :	37
Heterocompounds :	5
Rest (high molecular) :	3

Gasoline fraction (%) :	13.6
Sulphur (%) :	0.2
Vanadium (ppm) :	1.0
Nickel (ppm) :	3.0

Saturates Distribution
(Gas Chromatography)

Pristane / Phytane :	2.00
Pristane / n-C17 :	0.96
Phytane / n-C18 :	0.55
ACI :	15
Corr. Coeff. :	-0.9924

C7 Distribution
(Gas Chromatography)

C7 Alkanes (%)	
Normal C7 :	49
Monobranched :	39
Polybranched :	12
C7 Alkanes / Cycloalkanes (%)	
Normal C7 :	22
Cycloalkanes :	56
Branched Alkanes :	22
C7 Alkanes / Aromatics (%)	
Alkanes :	42
Cycloalkanes :	55
Aromatics :	3

Biomarkers Distribution
(Gas Chromatography / Mass Spectrometry)

Steranes/Triterpanes (%)	
Iso Steranes :	28
Rearranged Steranes :	58
Triterpanes :	14

Sterane Conversion (%)	
Iso Steranes :	33
Rearranged Steranes :	47
Normal Steranes :	20

Steranes Carbon Numbers (%)	
C27 :	30
C28 :	30
C29 :	40

Triterpanes (%)	
C30 Hopane :	100
Oleanane ($\alpha + \beta$) :	0
W + T :	0

C29 Sterane Ratios	
20S / (20R + 20S) :	0.59
Iso / (Iso + Normal) :	0.59

Triterpane Ratios	
Ts / Tm :	0.96
Ts / (Ts + Tm) :	0.49
3R / (3R + 5R) :	0.12

Aromatics Distribution
(Gas Chromatography / Mass Spectrometry)

Monoaromatic Steroids (%)	
C27 :	27
C28 :	44
C29 :	29

Phenanthrene Ratios	
MPI-1 :	0.66
F-1 :	0.44
F-2 :	0.22

Carbon Isotope Ratios
(Mass Spectrometry)

Total Oil (topped) :	-28.7
Saturates :	-29.1
Aromatics :	-28.0

Data for the enlarged part of the whole oil gas chromatogram from well 6407/12-01 (1661.6-1661.9 m), Norway

Peak Information				Retention Time	Area	Fit	Height	Peak Name
				12.09	34.527		9.9155	
				12.31	75.684		15.1103	
				12.50	58.337		15.4285	
				12.61	159.162		41.2707	
				12.78	263.204		38.1832	
				13.01	1912.611		366.3705	
				13.17	609.967		145.1957	
				13.27	561.195		137.9671	
				13.38	91.027		26.6872	
				13.50	432.813		75.6218	
				13.65	122.868		30.6262	
				13.74	51.178		13.0962	
				13.97	33.848		13.3628	
				14.05	393.688		76.8554	
				14.15	390.773		87.6995	
				14.38	25.911		4.9753	
				14.61	1094.941		184.5466	
				14.75	744.043		123.9286	
				15.04	81.262		17.3596	
				15.29	431.703		95.7525	
				15.38	632.487		145.0007	
				15.53	104.178		20.4898	
				15.66	121.383		27.7607	
				15.81	711.762		144.9337	
				15.89	54.921		22.5267	
				15.98	447.170		86.9021	
				16.19	30.460		5.5654	
				16.45	993.792		171.3747	
				16.58	342.865		80.4779	
				16.76	36.561		8.1369	
				16.87	84.934		13.9504	
				17.09	60.080		11.9449	
				17.30	43.891		9.2190	
				17.43	9.609		3.0306	
				17.80	2657.693		290.1086	nC9
				18.34	509.935		70.3958	
				18.53	364.581		71.2855	
				18.77	173.557		24.3707	
				18.91	75.540		14.0730	
				19.07	233.061		29.0213	
				19.36	1002.602		175.7814	
				19.53	164.244		32.5207	
				19.67	146.970		30.0463	
				19.86	218.407		27.0918	
				19.95	69.945		14.1856	
				20.21	850.832		129.1365	
				20.33	241.306		45.0763	
				20.49	87.780		16.0273	
				20.65	417.324		59.7579	
				20.77	99.089		18.1956	
				20.93	399.115		77.0067	
				21.07	144.749		38.9370	
				21.13	235.274		44.9328	
				21.34	1.227		0.4797	

*Data for the enlarged part of the whole oil gas chromatogram from
well 6407/12-01 (1661.6-1661.9 m), Norway*

Retention Time	Area	Fit	Height	Peak Name	Retention Time	Area	Fit	Height	Peak Name
21.50	339.248		57.1329		31.87	199.306		22.6981	
21.62	380.329		41.8494		32.02	158.693		17.7060	
21.93	64.136		11.7745		32.20	58.130		11.4915	
22.13	260.926		50.8172		32.31	153.845		16.3895	
22.27	568.153		88.2577		32.69	297.382		49.7185	
22.48	597.303		98.1646		32.92	790.797		114.6060	nC11
22.65	119.592		23.1336		33.14	32.652		4.7270	
22.74	130.028		24.7043		33.35	46.486		6.9797	
22.96	341.371		61.3499		33.52	76.309		9.1646	
23.12	47.514		9.9847		33.87	320.591		39.4748	
23.30	597.421		102.8872		34.07	29.078		5.8712	
23.41	344.380		62.9968		34.33	283.906		29.3428	
23.59	414.053		65.4275		34.46	65.361		8.7110	
23.72	56.248		13.0473		34.74	93.137		14.7262	
23.82	93.132		17.1706		34.99	621.233		78.0909	
23.99	23.547		5.9124		35.17	97.491		15.1743	
24.30	245.244		32.5825		35.37	129.556		21.0078	
24.43	55.458		8.7335		35.55	169.237		19.0997	
24.61	293.006		41.3703		35.71	45.769		7.7987	
24.81	28.691		6.6999		35.85	71.180		10.5159	
24.92	69.393		12.1675		35.95	37.540		7.0324	
25.17	909.745		130.6737	nC10	36.18	108.253		17.0259	
25.39	68.084		12.4839		36.29	89.627		15.2858	
25.53	121.367		23.2611		36.55	159.623		14.8656	
25.73	77.348		10.7119		36.73	120.120		15.3290	
25.98	32.135		5.0447		36.88	44.325		7.1479	
26.11	119.453		13.4664		37.17	359.663		32.7663	
26.33	303.946		43.1274		37.45	306.686		40.1833	
26.47	111.506		14.2440		37.81	464.642		55.0670	
26.75	120.461		15.2383		38.05	78.834		12.9798	
27.02	1124.561		174.7099		38.12	46.614		11.6958	
27.42	305.899		32.6174		38.26	205.659		33.2094	
27.62	113.611		14.1011		38.46	63.029		7.3108	
27.79	373.947		52.3544		38.55	43.165		7.1145	
28.13	389.804		38.9058		38.79	122.080		14.7462	
28.28	454.917		56.7544		38.99	153.057		20.3507	
28.42	99.794		18.7725		39.14	88.789		15.0350	
28.74	37.388		5.3996		39.31	117.039		19.3076	
28.83	150.015		22.4027		39.41	95.784		15.9312	
29.06	32.024		6.6287		39.51	71.768		12.5600	
29.15	88.797		8.8199		39.69	158.357		15.6489	
29.45	46.185		7.1689		39.87	64.295		10.2397	
29.63	315.092		41.8787		40.01	22.497		4.2556	
29.86	316.157		45.4663		40.17	0.549		0.2976	
29.98	71.576		13.6304		40.52	883.695		112.9804	nC12
30.16	398.487		62.8847		40.77	40.711		5.9297	
30.26	193.546		31.0970		40.83	38.310		6.1479	
30.61	359.026		48.2335		41.03	129.007		14.0256	
30.77	18.950		3.8670		41.38	182.094		19.9240	
30.97	36.531		4.5789		41.64	598.533		81.6664	iC13
31.18	198.507		30.6108		41.87	73.657		10.0147	
31.38	215.975		22.9683		42.13	146.607		16.6455	
31.59	157.573		23.8306		42.31	40.549		5.5991	
31.70	143.178		24.2040		42.57	137.050		13.4375	

**GC/MS data of the aromatic fraction from
well 6407/12-01 (1661.6-1661.9 m), Norway**

Report of sample: Norway 6407/12-01 1661.6-1661.9 m omc 8743

Acquired at : 10-Oct-1999

Standard used for calculations: PDP
Discrimination factor : 0.71

I) NAPHTHALENES			
a) Concentrations (ppm)		b) Parameters	
2-MN		427 4-MDBT/2+3-MDBT	1.79
1-MN		314 4-MDBT/1-MDBT	3.40
2,6+2,7-DMN		313 2+3-MDBT/1-MDBT	1.90
1,6-DMN		286 4-MDBT/DBT	1.15
1,5-DMN		133 2+3-MDBT/DBT	0.64
1,3,5+1,4,6-TMN		136 1-MDBT/DBT	0.34
2,3,6-TMN		93	
1,2,5-TMN		55 IV) BIPHENYLS	
C4-NAPH		27 a) Concentrations (ppm)	
THN		37 BP	84
CAD		14 2-MBP	12
Total Naphthalenes		1835 3-MBP	129
		4-MBP	43
		Total Biphenyls	267
b) Parameters			
2-MN/1-MN (MNR)	1.36	b) Parameters	
2,6+2,7-DMN/1,5-DMN (DNR-1)	2.35	0.68 3-MBP/BP	1.53
2,3,6-TMN/1,3,5+1,4,6-TMN (TNR-1)	1.69	1.69 3-MBP/4-MBP	2.98
2,3,6-TMN/1,2,5-TMN (TNR-2)	2.51	3-MBP/2-MBP	11.05
2,3,6-TMN/THN	6.75		
2,3,6-TMN/Cadelene		V) DIBENZOFURANS	
		a) Concentrations (ppm)	
II) PHENANTHRENES		DBF	14
a) Concentrations (ppm)		111 4-MDBF	29
P		55 2+3-MDBF	22
3-MP		57 1-MDBF	12
2-MP		81 Total Dibenzofurans	76
9-MP		65	
1-MP		370 b) Parameters	
Total Phenantrenes		4-MDBF/2+3-MDBF	1.33
		4-MDBF/1-MDBF	2.36
b) Parameters		0.88 2+3-MDBF/1-MDBF	1.78
2-MP/1-MP		0.66 4-MDBF/DBF	2.09
1.5*(2+3-MP/(P+1+9-MP)) (MPI-1)	0.67	2+3-MDBF/DBF	1.57
3*(2-MP/(P+1+9-MP)) (MPI-2)	0.77	1-MDBF/DBF	0.88
2+3-MP/1+9-MP	0.44		
2+3-MP/1+9+2+3-MP		VI) OVERALL RATIOS	
		Biphenyls/NAPH*	0.40
III) DIBENZOTHIOPHENES		Dibenzothiophenes/NAP	0.13
a) Concentrations (ppm)		27 Dibenzofurans/NAPH*	0.11
DBT		31	
4-MDBT		17	
2+3-MDBT		9	
1-MDBT		85	
Total Dibenzothiophenes			
MN = methylnaphthalene	P = phenanthrene		
DMN = dimethylnaphthalene	MP = methylphenanthrene		
TMN = trimethylnaphthalene	DBT = dibenzothiophene		
THN = tetrahyronaphthalene	MDBT= methyldibenzothiophene		
DBF = methyldibenzofuran	BP = biphenyl		
MDBF= methyldibenzofuran	MBP = methylbiphenyl		
NAPH*= 2,6+2,7-DMN + 1,5-DMN + 1,4,6+1,3,5-TMN + 2,3,6-TMN			

*GC/MS data of the aromatic fraction from
well 6407/12-01 (1661.6-1661.9 m), Norway*

VII) Misc. NAPHTHALENES

a) Concentrations (ppm)

2,6-DMN	170	4,5-DMP	4
2,7-DMN	143	2,6+3,6-DMP	24
1,3+1,7-DMN	384	3,5-DMP	21
1,6-DMN	286	2,7-DMP	13
1,4-DMN	n.d.	3,9-DMP	106
2,3-DMN	52	1,6+2,5+2,9-DMP	50
1,5-DMN	133	1,7-DMP	46
1,2-DMN	48	1,9+4,9-DMP	42
1,4+2,3-DMN	52	1,5-DMP	n.d.
		1,8-DMP	11
		1,2-DMP	7
		9,10-DMP	n.d.
1,3,7-TMN	119	1,2,6-TMP	5
1,3,6-TMN	165	1,2,5-TMP	8
1,3,5+1,4,6-TMN	136	1,2,9-TMP	3
2,3,6-TMN	93	1,2,7-TMP	n.d.
1,2,7-TMN	30	1,2,8-TMP	8
1,6,7-TMN	129		
1,2,6-TMN	5		
1,2,4-TMN	14		
1,2,5-TMN	55		
1,3,5,7-TeMN	48		
1,3,6,7-TeMN	48		
1,2,4,7-TeMN	34		
1,2,5,7-TeMN	9		
2,3,6,7-TeMN	16		
1,2,6,7-TeMN	12		
1,2,5,6-TeMN (C4-NAPH)	21		

b) Parameters

1,2,5-TMN/1,3,6-TMN	0.33
1,2,7-TMN/1,3,7-TMN	0.25

The assignment of some of these peaks is tentative

GC/MS data of the aromatic steroids from well 6407/12-01 (1661.6-1661.9 m), Norway

Report of sample: Norway 6407/12-01 1661.6-1661.9 m omc 8743

Acquired at : 10-Oct-1999

Standard used for calculations: First
Discrimination factor : 0.40

I) Monoaromatic steroids		II) Triaromatic steroids	
Intensities (arbitrary units)		Intensities (arbitrary units)	
MA C21 a ?	127	TA C20	181
MA C21 b ?	45	TA C21	191
MA C22 a ?	100	TA C22 20S	33
MA C22 b ??	52	TA C22 20R	26
MA C23 a ?	27	TA C26 20S	175
MA C23 b ?	16	TA C26 20R + TA C27 20S	502
MA C27 I 20S	34	TA C28 20S	325
MA C27 V 20S	119	TA C28 20S	n.d.
MA C27 I 20R + MA C27 V 20R	112	TA C27 20R	281
MA C27 II 20S	43	TA C29 20S	85
MA C28 I 20S	226	TA C29 20S	51
MA C28 V 20S	33	TA C28 20R	250
MA C27 II 20R	33	TA C29 20R	76
MA C28 II 20S	53		
MA C28 I 20R + MA C28 V 20R	173		
MA C29 I 20S + MA C29 V 20S	168		
MA C29 II 20S	29		
MA C28 II 20R	79		
MA C29 I 20R + MA C29 V 20R	127		
MA C29 II 20R	51		
III) Methylated Triaromatic steroids		IV) Parameters	
Intensities (arbitrary units)			
1Me TA C21 ?	21	% MA C27	27.03
3Me TA C21	43	% MA C28	43.18
6Me TA C21 ?	18	% MA C29	29.79
4Me TA C21	60		
3Me TA C22	47	TA C28/(MA C29 + TA C28)	0.61
4Me TA C22	52	MA(I)/MA(I+II)	0.20
3Me TA C27 20S	34	TA(I)/TA(I+II)	0.18
4Me TA C27 20S	52	MA C27 V 20S/(MA C27 (I+V) 2	0.78
2Me TA C28 20S	10	TA C26 20S/TA C28 20S	0.54
3Me TA (C27 + C28) 20S	77	TA C27 20R/TA C28 20R	1.12
4Me TA (C27 + C28) 20S ?	139	3Me TA C28 20R/3Me TA C29 20	1.00
4Me TA (C27 + C28) 20S ?	n.d.	3Me TA C29 20R/(3+4)Me TA C2	0.49
2Me TA C29 20S	19	TA (3+4)Me C27 20S/(3+4)Me C	1.84
TA dinosteroid D1	33	TA (3+4)Me C28 20R/(3+4)Me C	1.25
3Me TA C29 20S	47		
TA dinosteroid D2	70		
2Me TA C28 20R	83		
4Me TA C29 20S	n.d.		
3Me TA C28 20R	49		
4Me TA C28 20R	75		
TA dinosteroid D3	71		
TA dinosteroid D4	82		
2Me TA C29 20R	11		
3Me TA C29 20R	49		
TA dinosteroid D5	72		
4Me TA C29 20R	50		
TA dinosteroid D6	109		

GC data of the light fraction (< 120 C) of the oil sample from
well 6407/12-01 (1661.6-1661.9 m), Norway

COMPONENT No.	Name	RET. TIME (min)	HEIGHT (uV)	AREA (uVs)
1	methane	0.00	0	0
2	ethane	0.00	0	0
3	propane	24.34	6732	372224
4	i-butane	25.06	12086	632879
5	n-butane	25.74	42671	2258569
6	i-pentane	28.59	46212	2672706
7	n-pentane	30.33	62348	3860851
8	2.2-dimethylbutane	33.64	1304	92300
9	cyclopentane	36.01	5066	390326
10	2.3-dimethylbutane	37.68	3719	288789
11	2-methylpentane	38.58	30186	2384076
12	3-methylpentane	40.87	17552	1471287
13	n-hexane	44.95	44726	4249276
14	methylcyclopentane	49.38	23903	2537185
15	2.2-dimethylpentane	51.96	1093	115758
16	benzene	52.60	433	43827
17	2.4-dimethylpentane	53.62	2164	246557
18	2.2.3-trimethylbutane	55.15	350	30547
19	cyclohexane	59.71	27444	3674866
20	3.3-dimethylpentane	62.97	560	61520
21	1.1-dimethylcyclopentane	67.24	2856	397892
22	2-methylhexane	69.31	9591	1402400
23	2.3-dimethylpentane	69.90	3352	457328
24	1-c-3-dimethylcyclopentane	73.08	4468	714104
25	3-methylhexane	73.76	10598	1630858
26	1-tr-3-dimethylcyclopentane	75.23	4148	667232
27	1-tr-2-dimethylcyclopentane	76.55	6948	1120770
28	3-ethylpentane	78.22	1115	168408
29	standard	82.35	12573	2206230
30	n-heptane	90.97	19155	4006381
31	1-c-2-dimethylcyclopentane	95.93	1008	207865
32	methylcyclohexane	100.17	26667	6884976
33	1.1.3-trimethylcyclopentane	103.75	2059	434722
34	2.2-dimethylhexane	106.39	483	86539
35	ethylcyclopentane	109.30	1742	399329
36	2.5-dimethylhexane	116.08	897	223410
37	not_present	0.00	0	0
38	2.2.3-trimethylpentane	118.68	1150	287641
39	1-tr-2-c-4-trimethylcyclopentane	122.49	1688	450224
40	toluene	124.25	1909	536021

total area excluding i.s.: 45459642

Weight percentage internal standard: 0.66
Weight percentage C7 fraction : 13.60