

3.1 Petrophysical results

3.2 RFT summary

Two runs were done using Schlumberger RFT tool, HP (Hewlett Packard) and strain gauges.

The first run included the pressure tests and with the second run a sample was taken at 3610.0 mRKB (3512.0 mMSLTVD) which contained water and mud filtrate (which was sent onshore for analysis)

RFT DATA FROM WELL 6406/12-1S

NR.	DEPTH mRKB	DEPTH mMSL/TVD	HP kPa	STR kPa	REMARKS
1	3602.0	3504.0	-	-	tight
2	3603.5	3505.5	53333	53326	med.
3	3606.0	3508.0	53379.8	53351	low
4	3604.0	3506.0	53347.3	53332	low
5	3607.0	3509.0	53393.9	53360	low
6	3610.0	3512.0	53412	53385	med.
7	3612.0	3514.0	53426.5	53405	low
8	3614.0	3516.0	53460.5	53425	med.
9	3617.5	3519.5	53497.9	53459	med.
10	3619.0	3521.0	53489.2	53475	med.
11	3621.0	3523.0	53501.4	53493	low
12	3624.0	3526.0	53570.2	53552	low
13	3627.0	3529.0	53580.4	53579	low
14	3607.0	3509.0	53363.2	53360	low
15	3603.5	3505.5	53340.4	53329	good

Table 3.2.1

TOTAL MATERIALS

Well: 6406/12-1S Operator: Statoil
 From/to: 352,5 m 3965,0 m

Quantity:	Material:	Units:	Unit Price:	Total Cost NOK:
109	Bentonite	ton	2 075,00	226 175,00
125	Defoamer	kg	15,83	1 978,75
2932	Barite	ton	705,00	2 067 060,00
25700	CMC HV	kg	14,63	375 991,00
2325	Soda Ash	kg	2,38	5 533,50
1025	Bicarbonate Sod.	kg	3,61	3 700,25
41725	Celpol SL	kg	32,35	1 349 803,75
4450	Celpol Reg	kg	32,35	143 957,50
1225	Ancocide	kg	16,52	20 237,00
40050	Gypsum	kg	1,92	76 896,00
2280	Lime	kg	1,56	3 556,80
2750	Bentonite	kg	2,22	6 105,00
170	Desco CF	kg	19,98	3 396,60
2250	Anco Resin	kg	12,56	28 260,00
2250	Anco Lignite	kg	3,96	8 910,00
1000	Spercell Fe	kg	3,91	3 910,00
	VOLUME	m3		6587,00
Total Cost for Well:				4 325 471,15
Cost per meter:				1 197,36
Days: 71	Cost per m3:			656,67

CASING INTERVAL

Well: 6406/12-1S Operator: Statoil
 Casing: 30" From/to: 352,5 m 415,0 m
 Bit: 36" From/to: 352,5 m 416,0 m

New well:
 Casing: 30" From/to: 352,5 m 415,0 m
 Bit: 36" From/to: 352,5 m 417,0 m

Quantity:	Material:	Units:	Unit Price:	Total Cost NOK:
45	Wyoming Bentonite	mt	2 075,00	93 375,00
127	Barite	mt	705,00	89 535,00
500	Soda Ash	kg	2,38	1 190,00
2475	CMC EHV	kg	14,63	36 209,25
VOLUME m3				604,00
Total Cost for Interval:				220 309,25
Cost per meter				1 721,17
Days: 4	Cost per m3:			364,75

CASING INTERVAL

Well: 6406/12-1S **Operator:** Statoil
Casing: 20" **From/to:** 352,5 m 870,0 m
Bit: 26" **From/to:** 416,0 m 876,0 m

New well:
Casing: 20" **From/to:** 352,5 m 951,0 m
Bit: 26" **From/to:** 417,0 m 959,0 m

Quantity:	Material:	Units:	Unit Price:	Total Cost NOK:
22925	CMC HV	kg	14,63	335 392,75
1750	Soda Ash	kg	2,38	4 165,00
250	Ancocide	kg	16,52	4 130,00
706	Barite	mt	705,00	497 730,00
59	Wyoming Bentonite	mt	2 075,00	122 425,00
5525	Gypsum	kg	1,92	10 608,00
2625	Celpol S/L	kg	32,35	84 918,75
525	Celpol Reg	kg	32,35	16 983,75
100	Lime	kg	1,56	156,00
VOLUME m3				3 090,00
Total Cost for Interval:				1 076 509,25
Cost per meter				1 074,36
Days: 18	Cost per m3:			348,38

CASING INTERVAL

Well:	6406/12-1S	Operator:	Statoil	
Casing:	13 3/8"	From/to:	351,0 m	2532,0 m
Bit:	17 1/2"	From/to:	959,0 m	2546,0 m

Quantity:	Material:	Units:	Unit Price:	Total Cost NOK:
1084	Barite	metric ton	705,00	764 220,00
5	Wyoming Bentonite	metric ton	2 075,00	10 375,00
2750	Wyoming Bentonite	kg	2,22	6 105,00
300	CMC EHV	kg	14,63	4 389,00
575	Ancocide	kg	16,52	9 499,00
19600	Gypsum	kg	1,92	37 632,00
20775	Celpol S/L	kg	32,35	672 071,25
1400	Celpol Reg.	kg	32,35	45 290,00
840	Lime	kg	1,56	1 310,40
25	Defoamer	kg	15,83	395,75
700	Sod. Bicarb.	kg	3,61	2 527,00
170	Desco CF	kg	19,98	3 396,60
	VOLUME	m3		1 524,00
Total Cost for Interval:				1 557 211,00
Cost per meter				981,23
Days:	17	Cost per m3:		1 021,79

CASING INTERVAL

Well: 6406/12-1S **Operator:** Statoil
Casing: **From/to:**
Bit: 12 1/4" **From/to:** 2546,0 m 3965,0 m

Quantity:	Material:	Units:	Unit Price:	Total Cost NOK:
1015	Barite	metric ton	705,00	715 575,00
400	Ancocide	kg	16,52	6 608,00
14925	Gypsum	kg	1,92	28 656,00
18325	Celpol S/L	kg	32,35	592 813,75
2525	Celpol Reg.	kg	32,35	81 683,75
1340	Lime	kg	1,56	2 090,40
100	Defoamer	kg	15,83	1 583,00
325	Sod. Bicarb.	kg	3,61	1 173,25
75	Soda Ash	kg	2,38	178,50
2250	Anco Resin	kg	12,56	28 260,00
2250	Anco Lignite	kg	3,96	8 910,00
1000	Spercell Fe	kg	3,91	3 910,00
	VOLUME	m3		1 369,00
Total Cost for Interval:				1 471 441,65
Cost per meter				1 036,96
Days: 23+9 (P&A)	Cost per m3:			1 074,83

MATERIAL COST AND CONSUMPTION

Well: 6406/12-1S

Rig: ROSS RIG

Product	Unit size	Unit price NOK	36" sect.	Cost NOK	26" sect.	Cost NOK	17 1/2" sect.	Cost NOK	12 1/4" sect.	Cost NOK	Total consumed	Total cost NOK
Barite	mt	705,00	127	89 535,00	706	497 730,00	1084	764 220,00	1015	715 575,00	2932	2 067 060,00
Wyoming bentonite	mt	2 075,00	45	93 375,00	59	122 425,00	5	10 375,00			109	226 175,00
Soda Ash	kg	2,38	500	1 190,00	1750	4 165,00			75	178,50	2325	5 533,50
Celpol LV	kg	32,35			2625	84 918,75	20775	672 071,25	18325	592 813,75	41725	1 349 803,75
Celpol R	kg	32,35			525	16 983,75	1400	45 290,00	2525	81 683,75	4450	143 957,50
Ancocide	kg	16,52			250	4 130,00	575	9 499,00	400	6 608,00	1225	20 237,00
Anco Resin	kg	12,56							2250	28 260,00	2250	28 260,00
Lignite	kg	3,96							2250	8 910,00	2250	8 910,00
Gypsum	kg	1,92			5525	10 608,00	19600	37 632,00	14925	28 656,00	40050	76 896,00
Desco CF	kg	19,98					170	3 396,60			170	3 396,60
Defoamer	kg	15,83					25	395,75	100	1 583,00	125	1 978,75
Bentonite	kg	2,22					2750	6 105,00			2750	6 105,00
Spercell FE	kg	3,91							1000	3 910,00	1000	3 910,00
CMC EHV	kg	14,63	2475	36 209,25	22925	335 392,75	300	4 389,00			25700	375 991,00
Lime	kg	1,56			100	156,00	840	1 310,40	1340	2 090,40	2280	3 556,80
Bicarbonate	kg	3,61					700	2 527,00	325	1 173,25	1025	3 700,25
Total cost	NOK			220 309,25		1 076 509,25		1 557 211,00		1 471 441,65		4 325 471,15
Hole drilled	m			65		542		1587		1419		3613
Cost per metre	NOK/m			3 389,37		1 986,18		981,23		1 036,96		1 197,20
Total days				4		18		17		23		62,00
Cost per day	NOK/day			55 077,31		59 806,07		91 600,65		63 975,72		69 765,66
Mud mixed	m3			604		3090		1524		1369		6 587,00
Cost per m3	NOK/m3			364,75		348,38		1 021,79		1 074,83		656,67

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Grading

Title		
GEOCHEMICAL EVALUATION OF WELL 6406/12-1S		
Requested by KJELL RUUD	Project KRISTIANSUND	
Date 11/10/91	No. of pages 157	No. of enclosures

Key words Organic geochemistry, source rock quality, sandstone extracts, oil/source correlation, thermal maturity

Abstract

This study has been carried out in accordance with the Statoil Standard Guide for Organic Geochemistry at IKU. The main conclusions are reported on p.17.

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REPORT

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<p>REPORT TITLE:</p> <p>ORGANIC GEOCHEMICAL CHARACTERIZATION OF STATOIL WELL 6406/12-1S</p> <p>REPORT NO.: 22.2036.00/01/91</p>
<p>AUTHORS:</p> <p>Inghild Kaarstad</p>

DATE: 20 Sept.-91	NO. OF PAGES: 157	NO. OF APPENDICES: -	PROJECT MANAGER: Inghild Kaarstad	SIGN.: <i>Inghild Kaarstad</i>
CLIENT: Statoil Geolab, Attn.: Richard Patience			APPROVED, RESEARCHER RESPONSIBLE: Leslie Leith	SIGN.: <i>Leslie Leith</i>

SUMMARY:

Altogether 97 sediment samples, wet cuttings, cores and swc were characterized from Statoil well 6406/12-1S by organic geochemistry.

KEY WORDS: Haltenbanken	
6406/12-1S	
Organic Geochemical Characterization	

1. INTRODUCTION

Block 6406/12 is located south-west of the Njord field on Frøyahøgda, Haltenbanken (Figure 1). Well 6406/12-1S was completed at 3965 m. Only traces of hydrocarbons were detected in the well.

IKU has performed organic geochemical analyses for Statoil under contract T121450 no.57. The samples were handled by Geco Petroleum Laboratories, Stavanger.

Altogether, 97 samples were received for the following types of analysis:

Table 1.1 Samples received from Statoil and type of analyses.

IKU no.	Depth	Sample type	Gas	VR	TOC	RE	Fo.-up
G4062	1000	cuttings	X	X			
G4063	1100	cuttings	X	X			
G4064	1200	cuttings	X	X			
G4065	1300	cuttings	X	X			
G4066	1400	cuttings	X				
G4067	1500	cuttings	X	X			
G4068	1600	cuttings	X	X			
G4069	1700	cuttings	X				
G4070	1800	cuttings	X	X			
G4071	1900	cuttings	X	X			
G4072	2000	cuttings	X	X			
G4073	2100	cuttings	X	X			
G4074	2200	cuttings	X	X			
G4076	2300	cuttings	X	X			
G4077	2350	cuttings	X	X			
G4078	2400	cuttings	X	X			
G4079	2450	cuttings	X				
G4080	2500	cuttings	X	X			
G4081	2550	cuttings	X				
G4082	2565	swc		X			
G4083	2600	cuttings	X				
G4084	2650	cuttings	X				
G4085	2670	swc		X			
G4086	2700	cuttings	X				
G4087	2719	swc		X			
G4088	2750	cuttings	X				
G4089	2800	cuttings	X				
G4090	2830	swc		X			
G4091	2850	cuttings	X				
G4092	2900	cuttings	X	X			
G4093	2950	cuttings	X				
G4094	3000	cuttings	X				
G4095	3035	swc		X			
G4096	3050	cuttings	X				
G4097	3100	cuttings	X				
G4098	3140	swc		X			

Table 1.1 continued

IKU no.	Depth	Sample type	Gas	VR	TOC	RE	Fo.-up
G4099	3150	cuttings	X				
G4100	3200	cuttings	X				
G4101	3250	cuttings	X	X			
G4102	3300	cuttings	X				
G4103	3350	cuttings	X				
G4104	3387	swc		X			
G4105	3400	cuttings	X				
G4106	3450	cuttings	X				
G4107	3465	swc		X			
G4108	3501	cuttings	X				
G4109	3550	swc		X			
G4110	3561	cuttings	X	X			
G4111	3591	cuttings	X				
G4112	3603.26	core					X
G4113	3608	core					X
G4114	3613	core					X
G4115	3618	core					X
G4116	3623	core					X
G4117	3628	core					X
G4118	3633	core					X
G4119	3637.64	core					X
G4120	3640	cuttings			X		X
G4121	3646	cuttings			X		X
G4454	3648.0	swc			X		X
G4122	3652	swc	X	X	X		X
G4455	3656.0	swc			X		X
G4123	3664	swc			X		X
G4124	3670	swc			X		X
G4456	3675.0	swc			X		X
G4125	3679	swc			X		X
G4126	3685	swc			X		X
G4127	3691	swc			X		X
G4128	3697	swc	X				
G4129	3703	swc			X		X
G4130	3714	swc			X		X
G4131	3727	swc			X		X
G4132	3739	cuttings			X		X
G4133	3742	cuttings	X	X			
G4134	3748	cuttings			X		X
G4135	3751.4	swc			X		X
G4136	3760	cuttings			X		X
G4137	3775	cuttings			X		X
G4138	3787	cuttings	X				
G4139	3790	cuttings			X		X
G4140	3802	cuttings			X		X
G4141	3811	swc			X		X
G4142	3816	core			X		
G4143	3816.38	core			X		X
G4144	3816.80	core			X		X
G4145	3817.20	core			X		X
G4146	3823	cuttings			X		X
G4147	3832	cuttings	X		X		X
G4148	3844	cuttings			X		X
G4149	3850	cuttings			X		X
G4150	3862	swc		X	X		X
G4151	3871	cuttings			X		X

Table 1.1 continued

IKU no.	Depth	Sample type	Gas	VR	TOC	RE	Fo.-up
G4152	3877	cuttings	X				
G4153	3880	cuttings			X	X	X
G4154	3892	cuttings			X	X	
G4155	3937	cuttings	X				
G4156	3937	swc		X			

The following analyses were performed on samples selected for Follow-up analysis:

Table 1.2 Follow-up analyses on selected samples.

IKU no.	Depth	Sample type	Py-GC	EOM/MPLC	GC EOM	GC sat+aro	GC/MS sat+aro
G4112	3603.26	core		X	X	X	X
G4115	3618.00	core		X	X	X	X
G4116	3623.00	core		X		X	
G4119	3637.64	core		X		X	
G4123	3664	cut	X	X		X	
G4126	3685	cut	X	X	X	X	X
G4131	3727.0	swc	X	X	X	X	X
G4136	3760	cut	X	X		X	
G4142	3816.00	core	X	X	X	X	X
G4150*	3862.0	swc	X				
G4153	3880	cut		X		X	

* Py-GC was performed on G4150 instead of G4153.

1.1 Comments to some of the analyses

Vitrinite reflectance data

During sample preparation, the rock comprising the samples was found to be poorly indurated, with the result that problems were encountered during polishing due to "plucking" of the sample material. The net result of this is the development of a marked relief on the polished sample surface which reduces the area of sample available for measurement. Samples from the Cretaceous Shetland and Cromer Knoll Groups were found to contain only small amounts of reworked phytoclasts and therefore some of the lower mean vitrinite reflectance values from this interval may be influenced by caving from the overlying Tertiary strata.

The best sample measurements were obtained on rocks from the lower Tertiary (Rogaland Group) and Jurassic successions.

Headspace and occluded gas analysis

Occluded gas was not analysed from 1600 m and 1800 m because of small amounts of sample material. Due to an internal misunderstanding we did not measure the exact weights of washed cuttings in the interval 2000 - 3000 m. This probably means that the headspace concentrations are somewhat overestimated, but we consider that the order of magnitude is about right.

Saturated and aromatic hydrocarbon chromatograms

In the saturated hydrocarbon gas chromatograms of samples G4115, G4116, G4131 and G4142, n-C₂₅ coelutes with an unknown peak. This contamination occurred during the work-up procedures as it is absent in the total extract gas chromatograms. Due to the coelution problems, n-C₂₅ was re-estimated for these samples as described in Table 12 and the new values were used for discussion. Contamination peaks are also present in some of the aromatic hydrocarbon gas chromatograms.

1.2 Personnel participating in the project.

The analyses have been done by Cecilie Sneeggen, Torun Vinge, Kristin Lind and Inghild Kaarstad. The lithological description was done by Deborah Ann Leith. Vitrinite reflectance measurements were done by Leslie Leith. Kåre Holst made the figures and Anne Larsen typed the manuscript. Inghild Kaarstad has been in charge of the project, together with May Britt Myhr.

Table 1: Table of gas results, headspace gas (μl gas per kg rock)

IKUNO	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET- NESS (%)	iC4 --- nC4
6406/12-1S											
G4062	1000	51615	168	43	14	0	0	51840	225	0	-1.00
G4063	1100	39223	150	58	25	1	3	39457	234	1	25.00
G4064	1200	794776	2805	1152	224	53	83	799010	4234	1	4.23
G4065	1300	269288	558	294	13	16	3	270169	881	0	0.81
G4066	1400	190606	1217	564	120	0	6	192507	1901	1	-1.00
G4067	1500	67553	475	123	24	52	1	68227	674	1	0.46
G4068	1600	463815	2448	361	113	19	116	466756	2941	1	5.95
G4069	1700	415583	2610	271	16	0	1	418480	2897	1	-1.00
G4070	1800	223479	2435	234	45	4	135	226197	2718	1	11.25
G4071	1900	284715	4138	597	200	86	223	289736	5021	2	2.33
G4072	2000	132641	1543	190	36	0	18	134410	1769	1	-1.00
G4073	2100	81400	1146	122	39	14	73	82721	1321	2	2.79
G4074	2200	46566	649	152	58	50	142	47475	909	2	1.16
G4076	2300	53186	517	109	31	0	13	53843	657	1	-1.00
G4077	2350	18490	233	77	29	20	69	18849	359	2	1.45
G4078	2400	30207	498	183	59	55	37	31002	795	3	1.07
G4079	2450	49929	1039	397	114	119	204	51598	1669	3	0.96
G4080	2500	27411	652	307	97	108	204	28575	1164	4	0.90
G4081	2550	5457	236	164	77	78	290	6012	555	9	0.99
G4083	2600	12700	389	202	104	82	242	13477	777	6	1.27
G4084	2650	14472	376	196	95	59	106	15198	726	5	1.61
G4086	2700	15740	659	365	168	88	168	17020	1280	8	1.91
G4088	2750	17228	718	464	239	100	73	18749	1521	8	2.39
G4089	2800	8565	371	239	122	54	87	9351	786	8	2.26
G4091	2850	12846	484	364	251	77	190	14022	1176	8	3.26
G4092	2900	15989	796	604	317	105	84	17811	1822	10	3.02
G4093	2950	2977	502	262	150	52	67	3943	966	24	2.88
G4094	3000	6012	236	282	214	75	40	6819	807	12	2.85
G4096	3050	562	21	30	24	9	7	646	84	13	2.67
G4097	3100	642	36	50	35	15	30	778	136	17	2.33
G4099	3150	1055	68	55	35	23	51	1236	181	15	1.52
G4100	3200	2460	106	104	52	30	53	2752	292	11	1.73
G4101	3250	2734	282	258	120	102	144	3496	762	22	1.18
G4102	3300	2262	122	140	63	49	44	2636	374	14	1.29
G4103	3350	1521	161	129	28	42	64	1881	360	19	0.67
G4105	3400	256	24	21	7	5	2	313	57	18	1.40
G4106	3450	1290	140	117	29	36	15	1612	322	20	0.81
G4108	3501	734	91	35	0	4	6	864	130	15	0.00
G4110	3561	1319	144	58	0	2	4	1523	204	13	0.00
G4111	3591	775	52	94	7	27	13	955	180	19	0.26
G4122	3652	4168	1633	4030	749	2067	2652	12647	8479	67	0.36
G4128	3697	10515	2694	7667	1364	4287	4096	26527	16012	60	0.32
G4133	3742	29392	6689	15073	1698	5371	2894	58223	28831	50	0.32
G4138	3787	24491	5144	8278	896	2070	824	40879	16388	40	0.43
G4147	3832	6757	2797	6842	1133	3440	2747	20969	14212	68	0.33
G4152	3877	5010	2232	4816	706	2259	1706	15023	10013	67	0.31
G4155	3937	21198	6875	17108	3097	11430	13878	59708	38510	64	0.27

Legend

-1 - No data available.

Table 2: Table of gas results, Occluded gas (μl gas per kg dry rock)

IKUNO	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET- NESS (%)	iC4 --- nC4
6406/12-1S											
G4062	1000	300	5	5	0	0	0	310	10	3	-1.00
G4063	1100	749	13	17	0	4	36	783	34	4	0.00
G4064	1200	668	66	108	0	0	136	842	174	21	-1.00
G4065	1300	571	48	88	0	0	90	707	136	19	-1.00
G4066	1400	597	0	91	0	0	237	688	91	13	-1.00
G4067	1500	599	49	102	0	0	144	750	151	20	-1.00
G4068	1600	-1									
G4069	1700	468	47	63	0	0	66	578	110	19	-1.00
G4070	1800	-1									
G4071	1900	717	145	270	0	46	358	1178	461	39	0.00
G4072	2000	402	55	86	30	24	196	597	195	33	1.25
G4073	2100	137	31	33	18	15	140	234	97	41	1.20
G4074	2200	197	29	55	28	36	533	345	148	43	0.78
G4076	2300	151	19	31	12	14	167	227	76	33	0.86
G4077	2350	167	22	39	19	25	215	272	105	39	0.76
G4078	2400	172	20	46	22	36	285	296	124	42	0.61
G4079	2450	356	42	88	35	56	454	577	221	38	0.63
G4080	2500	474	36	69	16	36	379	631	157	25	0.44
G4081	2550	124	6	13	9	16	317	168	44	26	0.56
G4083	2600	1398	190	303	0	53	366	1944	546	28	0.00
G4084	2650	890	85	110	0	23	254	1108	218	20	0.00
G4086	2700	1511	195	324	0	52	395	2082	571	27	0.00
G4088	2750	1204	118	244	0	51	285	1617	413	26	0.00
G4089	2800	561	52	102	33	34	214	782	221	28	0.97
G4091	2850	1492	194	341	0	56	468	2083	591	28	0.00
G4092	2900	906	89	154	41	44	209	1234	328	27	0.93
G4093	2950	571	81	131	32	40	245	855	284	33	0.80
G4094	3000	2060	293	544	0	110	539	3007	947	31	0.00
G4096	3050	285	31	71	54	41	175	482	197	41	1.32
G4097	3100	722	53	85	54	45	243	959	237	25	1.20
G4099	3150	12764	593	309	41	78	237	13785	1021	7	0.53
G4100	3200	1986	146	99	25	50	155	2306	320	14	0.50
G4101	3250	3076	264	145	19	64	147	3568	492	14	0.30
G4102	3300	1235	96	76	16	47	142	1470	235	16	0.34
G4103	3350	2472	212	160	20	87	250	2951	479	16	0.23
G4105	3400	719	61	82	37	49	160	948	229	24	0.76
G4106	3450	1869	152	118	0	72	249	2211	342	15	0.00
G4108	3501	948	66	65	0	44	104	1123	175	16	0.00
G4110	3561	591	43	64	0	23	50	721	130	18	0.00
G4111	3591	832	41	66	6	61	77	1006	174	17	0.10
G4122	3652	415	120	945	152	920	2414	2552	2137	84	0.17
G4128	3697	589	116	1353	230	1489	4239	3777	3188	84	0.15
G4133	3742	771	749	6198	903	4793	5251	13414	12643	94	0.19
G4138	3787	861	567	3152	414	1970	1980	6964	6103	88	0.21
G4147	3832	478	339	2847	628	3195	7044	7487	7009	94	0.20
G4152	3877	390	192	1312	236	1283	2157	3413	3023	89	0.18
G4155	3937	994	310	1314	304	1900	8086	4822	3828	79	0.16

Legend

-1 - No data available.

Table 3: Table of gas results, summation of Headspace and Occluded gas (µl gas per kg dry rock).

IKUNO	DEPTH (m)	C1	C2	C3	iC4	nC4	C5+	SUM C1-C4	SUM C2-C4	WET- NESS (%)	iC4 --- nC4
6406/12-1S											
G4062	1000	51915	173	48	14	0	0	52150	235	0	-1.00
G4063	1100	39972	163	75	25	5	39	40240	268	0	5.00
G4064	1200	795444	2871	1260	224	53	219	799852	4408	0	4.23
G4065	1300	269859	606	382	13	16	93	270876	1017	0	0.81
G4066	1400	191203	1217	655	120	0	243	193195	1992	1	-1.00
G4067	1500	68152	524	225	24	52	145	68977	825	1	0.46
G4068	1600	463815	2448	361	113	19	116	466756	2941	0	5.95
G4069	1700	416051	2657	334	16	0	67	419058	3007	0	-1.00
G4070	1800	223479	2435	234	45	4	135	226197	2718	1	11.25
G4071	1900	285432	4283	867	200	132	581	290914	5482	1	1.52
G4072	2000	133043	1598	276	66	24	214	135007	1964	1	2.75
G4073	2100	81537	1177	155	57	29	213	82955	1418	1	1.97
G4074	2200	46763	678	207	86	86	675	47820	1057	2	1.00
G4076	2300	53337	536	140	43	14	180	54070	733	1	3.07
G4077	2350	18657	255	116	48	45	284	19121	464	2	1.07
G4078	2400	30379	518	229	81	91	322	31298	919	2	0.89
G4079	2450	50285	1081	485	149	175	658	52175	1890	3	0.85
G4080	2500	27885	688	376	113	144	583	29206	1321	4	0.78
G4081	2550	5581	242	177	86	94	607	6180	599	9	0.91
G4083	2600	14098	579	505	104	135	608	15421	1323	8	0.77
G4084	2650	15362	461	306	95	82	360	16306	944	5	1.16
G4086	2700	17251	854	689	168	140	563	19102	1851	9	1.20
G4088	2750	18432	836	708	239	151	358	20366	1934	9	1.58
G4089	2800	9126	423	341	155	88	301	10133	1007	9	1.76
G4091	2850	14338	678	705	251	133	658	16105	1767	11	1.89
G4092	2900	16895	885	758	358	149	293	19045	2150	11	2.40
G4093	2950	3548	583	393	182	92	312	4798	1250	26	1.98
G4094	3000	8072	529	826	214	185	579	9826	1754	17	1.16
G4096	3050	847	52	101	78	50	182	1128	281	24	1.56
G4097	3100	1364	89	135	89	60	273	1737	373	21	1.48
G4099	3150	13819	661	364	76	101	288	15021	1202	8	0.75
G4100	3200	4446	252	203	77	80	208	5058	612	12	0.96
G4101	3250	5810	546	403	139	166	291	7064	1254	17	0.84
G4102	3300	3497	218	216	79	96	186	4106	609	14	0.82
G4103	3350	3993	373	289	48	129	314	4832	839	17	0.37
G4105	3400	975	85	103	44	54	162	1261	286	22	0.81
G4106	3450	3159	292	235	29	108	264	3823	664	17	0.27
G4108	3501	1682	157	100	0	48	110	1987	305	15	0.00
G4110	3561	1910	187	122	0	25	54	2244	334	14	0.00
G4111	3591	1607	93	160	13	88	90	1961	354	18	0.15
G4122	3652	4583	1753	4975	901	2987	5066	15199	10616	69	0.30
G4128	3697	11104	2810	9020	1594	5776	8335	30304	19200	63	0.28
G4133	3742	30163	7438	21271	2601	10164	8145	71637	41474	57	0.26
G4138	3787	25352	5711	11430	1310	4040	2804	47843	22491	47	0.32
G4147	3832	7235	3136	9689	1761	6635	9791	28456	21221	74	0.27
G4152	3877	5400	2424	6128	942	3542	3863	18436	13036	70	0.27
G4155	3937	22192	7185	18422	3401	13330	21964	64530	42338	65	0.26

Legend

-1 - No data available.

Table 4 *Lithology and total organic carbon measurements*
Well no. 6406/12-1.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4062	1000		40% Carbonate, fine-grained 20% Sandstone, grey, medium to fine 10% Claystone, micaceous, fine-grained 10% Drilling deposits Sm.am. Coal, bit?, Caving, Metal, Plastic
G4063	1100		60% Sandstone, light grey to grey, medium to coarse grained, micaceous 20% Sandstone, dark grey, black-some, coal layers, micaceous, fine-grained 10% Coal fragments 5% Quartz fragments, clear to light grey 5% Drilling deposits (mud, plastic, Portland cement, Barite, Mica).
G4064	1200		100% Claystone, micaceous, calcareous, grey brown Coal, Drilling deposits (Mud, Plastic, Metal)
G4065	1300		100% Claystone, micaceous, grey, calcareous Sm.am. Metal, Plastic, Fibre
G4066	1400		100% Claystone, micaceous, grey, calcareous
G4067	1500		50% Claystone, micaceous, light to medium grey, calcareous 40% Claystone, micaceous, medium - dark grey, non-calcareous 10% Sandstone, light grey to medium grey, quartzitic, micaceous, medium to coarse grained Sm.am. Drilling deposits (Plastic, Metal, Portland cement)
G4068	1600		70% Claystone, pyritic, dark grey, micaceous 20% Sandstone, light grey, medium to coarse grained, micaceous, laminated 10% Portland cement
G4069	1700		100% Claystone, pyritic, dark grey, micaceous
G4070	1800		100% Claystone, pyritic, dark grey, micaceous Sm.am. Coal + Portland cement

Table 4 Lithology and total organic carbon measurements
Well no. 6406/12-1.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4071	1900		50% Claystone, dark grey, micaceous 50% Claystone, light grey, micaceous Sm.am. Coals, Drilling fluid
G4072	2000		100% claystone, light grey, micaceous Sm.am. Drilling deposits (Cement, Mud)
G4073	2100		30% Claystone, light grey, micaceous 30% Claystone, medium grey, micaceous 30% Sandstone, medium grey, micaceous, fine-medium grained 10% Drilling deposits (Cement, Pyrite) Sm.am. Coal
G4074	2200		35% Claystone, medium grey, micaceous, laminated, Coal? 35% Sandstone, medium grey, micaceous, fine-medium grained 30% Claystone, light grey, micaceous Sm.am. Coal, Drilling deposits, Pyrite
G4076	2300		50% Claystone, medium grey, micaceous, laminated 30% Claystone, light grey, carbonaceous, laminated, micaceous 10% Claystone, reddish, grey, micaceous 10% Claystone, olive grey, micaceous Sm.am. Coal, Drilling cement
G4077	2350		50% Claystone, light grey, micaceous, car- bonaceous laminae 30% Claystone, dark grey, micaceous 15% Sandstone, medium-dark grey, micaceous, fine-medium grained 5% Claystone, olive grey, micaceous Sm.am. Claystone (reddish brown), Drilling deposits (Fibres, Cement)
G4078	2400		70% Claystone, light grey, micaceous, car- bonaceous laminae 20% Claystone, medium-dark grey, micaceous 5% Claystone, reddish grey, micaceous 5% Claystone, reddish brown Sm.am. Drilling deposits (Pyrite, Plastic, Cement)

Table 4 Lithology and total organic carbon measurements
Well no. 6406/12-1.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4079	2450		70% Claystone, light grey, micaceous, laminated 10% Claystone, dark grey, micaceous 10% Claystone, light olive grey 10% Drilling deposits (Pyrite, Plastic, Metal) Sm.am. Claystone, reddish brown
G4080	2500		50% Claystone, medium grey, micaceous 30% Claystone, light grey, micaceous, carbonaceous laminae 10% Claystone, dark grey, pyritic 10% Sandstone, light grey quartzitic, fine grained Sm.am. Drilling deposits (Cement, Mud)
G4081	2550		95% Claystone, calcareous, light grey 5% Claystone, medium grey, micaceous Sm.am. Drilling mud, Plastic, Mica
G4082	2565.00 (swc)		100% Claystone, medium-dark grey, micromicaceous, (mud-caked)
G4083	2600		95% Claystone, light-medium grey 5% Drilling deposits (Plastic, Metal)
G4084	2650		All material used for occluded gas analysis
G4085	2670.00 (swc)		Claystone, light grey, micromicaceous, (mud-caked)
G4086	2700		80% Claystone, dark grey 20% Sandstone, light-medium grey, quartzitic, fine-medium grained Sm.am. Drilling deposits (Barite, Metal, Plastic)
G4087	2719.00 (swc)		100% Claystone, dark grey
G4088	2750		100% Claystone, light-dark grey, laminated, micaceous, calcareous Sm.am. Drilling deposits (Cement)
G4089	2800		70% Sandstone, light grey, calcareous, fine-medium grained, micaceous 20% Claystone, dark grey 10% Claystone, light grey, micromicaceous Sm.am. Drilling cement

Table 4 Lithology and total organic carbon measurements
Well no. 6406/12-1.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4090	2830.00 (swc)		100% Claystone, light grey, micromicaceous
G4091	2850		80% Sandstone, light grey, calcareous, medium grained, micaceous 20% Claystone, dark grey Sm.am. Bitumen, Metal, Fibres
G4092	2900		70% Sandstone, light grey, calcareous, fine grained 30% Claystone, dark grey Sm.am. Drilling deposits (Metal, Barite)
G4093	2950		50% Sandstone, light grey, calcareous, fine-medium grained 50% Claystone, dark grey Sm.am. Coal, Drilling deposits (Mud, Metal)
G4094	3000		100% Claystone, dark grey, micaceous Sm.am. Calcite
G4095	3035.00 (swc)		100% Claystone, dark grey, micaceous
G4096	3050		100% Claystone, dark grey, micaceous, lami- nated, calcareous Sm.am. Drilling cement, Metal
G4097	3100		100% Claystone, dark grey, micaceous, lami- nated Sm.am. Coal, Drilling deposits (Barite, Metal)
G4098	3140.00 (swc)		100% Claystone, dark grey, micromicaceous
G4099	3150		50% Coal 50% Claystone, dark grey, micromicaceous Sm.am. Drilling deposits (Cement, Metal, Plastic)
G4100	3200		70% Claystone, dark grey, micaceous, with coaly laminae 30% Sandstone, light-medium grey, calca- reous quartzitic, fine-medium grained Sm.am. Drilling deposits (Metal, Cement)
G4101	3250		80% Claystone, dark grey, micaceous, with coaly laminae 20% Sandstone, light-medium grey, calca- reous quartzitic, fine-grained Sm.am. Drilling deposits (Cement)

Table 4 Lithology and total organic carbon measurements
Well no. 6406/12-1.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4102	3300		100% Claystone, dark grey, micaceous, coaly laminae Sm.am. Coal, Drilling mud
G4103	3350		100% Claystone, dark grey, micaceous Sm.am. Claystone, light grey, micromicaceous
G4104	3387.00 (swc)		100% Claystone, dark grey, micromicaceous
G4105	3400		80% Claystone, dark grey, micaceous (laminated) 20% Coal Sm.am. Drilling mud, Cement
G4106	3450		70% Sandstone, light-medium grey, calcareous, coaly laminae present in parts, fine-grained 30% Claystone, medium grey, micaceous, laminated Sm.am. Coal
G4107	3465.00 (swc)		100% Claystone, dark grey, calcareous
G4108	3501		100% Claystone, dark grey, calcareous, micaceous Sm.am. Claystone (reddish brown, calcareous), Claystone (dark grey), Coal
G4109	3550.00 (swc)		100% Claystone, dark grey, micromicaceous
G4110	3561		40% Claystone, dark grey, laminated, micaceous 25% Claystone, light grey, micaceous 25% Marl, reddish brown, calcareous 10% Sandstone, medium grey with coaly laminae, medium grained
G4111	3591		60% Marl, reddish brown, calcareous 30% Claystone, medium grey, micromicaceous 5% Sandstone, medium-dark grey, calcareous with coaly laminae, fine-grained 5% Sandstone, light grey, calcareous, fine-medium grained
G4112	3603.26 (core)		100% Sandstone, light grey, quartzitic, medium grained
G4113	3608.00 (core)		100% Sandstone, light grey conglomeratic, well sorted, quartz clasts and Claystone clasts prominent

Table 4 *Lithology and total organic carbon measurements*
 Well no. 6406/12-1S. The underlined lithology is used for analyses.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4114	3613.00 (core)		100% Sandstone, light grey, quartzitic, medium grained
G4115	3618.00 (core)		100% Sandstone, fine-grained, light grey, quartzitic, well-sorted, some micaceous layering
G4116	3623.00		100% Sandstone, fine-medium grained, light grey, quartzitic, well-sorted
G4117	3628.00		100% Sandstone, very fine-grained, light grey, quartzitic, well-sorted
G4118	3633.00 (core)		100% Sandstone, fine-grained, light grey, well-sorted with dark micaceous laminae in parts
G4119	3637.64 (core)		100% Sandstone, fine-grained, grey laminated (carbonaceous)
G4120	3640	1.05	50% <u>Claystone, medium-dark grey, micaceous</u> 50% claystone, light grey, micaceous Sm.am. Claystone, reddish brown, micaceous Coal, Drilling cement
G4121	3646	0.78	60% <u>Claystone, light-medium grey, micro-micaceous, calcareous</u> 30% Claystone, dark grey, micaceous, slightly calcareous 10% Coal Sm.am. Claystone (reddish brown, calcareous, micaceous), Sandstone (light grey, fine-grained), Drilling deposits (Metal, Plastic)
G4454	3648 (swc)	1.16	100% Siltstone, fine - very fine-grained, medium - dark grey, well cemented, non-calcareous, micaceous, laminated (cross-bedding?)
G4122	3652	1.15	90% <u>Claystone, medium-dark grey, micaceous with carbonaceous material laminae in parts</u> 10% Sandstone, fine-grained, light grey quartzitic Sm.am. Claystone (reddish brown, calcareous, micaceous), Sandstone (fine-grained, light grey, quartzitic), Coal, Drilling deposits (Plastic, Metal)

Table 4 *Lithology and total organic carbon measurements*
Well no. 6406/12-1S. The underlined lithology is used for analyses.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4455	3645 (swc)	2.42	100% Sandstone, fine - very fine grained Siltstone, medium dark grey, slightly calcareous, micaceous, moderately well- cemented
G4123	3664	1.01	100% <u>Claystone, medium to dark grey, mica- ceous</u> Sm.am. Claystone (light grey, calcareous, micaceous), Claystone (reddish brown, calcareous, micaceous) Drilling deposits (Metal, Plastic)
G4124	3670	1.33	60% <u>Claystone, dark grey, micaceous</u> 30% Claystone, light-medium grey, micaceous with carbonaceous clasts 10% Sandstone, light-medium grey, fine- grained quartzitic Sm.am. Claystone (reddish brown, calcareous, micaceous), Drilling deposits (Barites, Plastic, Cement casing)
G4456	3675 (swc)	3.64	100% Siltstone, fine - very fine grained, medium dark grey, calcareous, mica- ceous, coal fragments
G4125	3679	1.10	50% <u>Claystone, dark grey, micaceous, calca- reous</u> 40% Claystone, light-medium grey, micaceous 5% Claystone, reddish brown, calcareous, micaceous 5% Drilling deposits - casing cement Sm.am. Coal, Drilling deposits (Plastic, Metal)
G4126	3685	3.42	80% <u>Sandstone, dark grey, strongly calca- reous, micaceous</u> 20% Claystone, light-medium grey, micaceous Sm.am. Claystone (reddish brown, calcareous, micaceous), Sandstone (light-medium grey, fine-grained quartzitic)
G4127	3691	1.11	60% <u>Claystone, light-medium grey, micro- micaceous</u> 40% Sandstone, dark grey, strongly cal- careous, micaceous Sm.am. Claystone (reddish brown, calcareous, micaceous), Drilling deposits (Calcite, Metal, Fibres)

Table 4 Lithology and total organic carbon measurements
Well no. 6406/12-1S. The underlined lithology is used for analyses.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4128	3697		80% Claystone, medium-dark grey, micaceous 10% Sandstone, dark grey, strongly calcareous, micaceous 10% Sandstone, light-medium grey, fine-grained quartzitic Sm.am. Drilling deposits (Plastic, Casing cement)
G4129	3703	0.88	50% <u>Claystone, light-medium grey, micromicaceous</u> 40% Sandstone, dark grey, strongly calcareous, micaceous 10% Claystone, medium-dark grey, micaceous with coaly laminations in part Sm.am. Coal, Claystone (reddish brown, micaceous, calcareous), Drilling deposits (Casing cement)
G4130	3714.00 (swc)	3.19	100% Claystone, light-medium grey, laminated, calcareous (mud coated)
G4131	3727.00 (swc)	5.51	100% Claystone, dark grey, micaceous, calcareous, laminated
G4132	3739	1.16	50% Sandstone, dark grey, fine-medium grained, micaceous, calcareous 50% <u>Claystone, dark grey, micaceous, calcareous</u> Sm.am. Sandstone (light grey, quartzitic, fine-grained), Drilling deposits (Casing Cement)
G4133	3742		50% Claystone, dark grey, micaceous, calcareous, laminated in parts 40% Sandstone, light grey, fine-grained, calcareous 10% Sandstone, dark grey, micaceous, calcareous Sm.am. Coal (lignite?)
G4134	3748	1.10	70% <u>Claystone, dark grey, micaceous</u> 20% Sandstone, dark grey, micaceous, fine-grained, calcareous 10% Sandstone, light grey, fine-grained, calcareous
G4135	3751.40 (swc)	1.44	100% Claystone, medium grey, micromicaceous, calcareous

Table 4 *Lithology and total organic carbon measurements
Well no. 6406/12-1S. The underlined lithology is used for analyses.*

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4136	3760	6.43	70% <u>Sandstone, medium to dark grey, fine-grained, micaceous, calcareous, laminated</u> 20% Claystone, light-medium grey, micaceous 10% Carbonate, white Sm.am. Drilling deposits (Metal, Plastic)
G4137	3775	6.79	90% <u>Sandstone, medium to dark grey, fine-grained, micaceous, calcareous, laminated</u> 5% Claystone, light-medium grey, micaceous 5% Sandstone, light grey, fine-grained, calcareous Sm.am. Drilling deposits (Metal, Plastic)
G4138	3787		80% Claystone, medium to dark grey, micaceous, partly laminated 20% Sandstone, light grey, fine-grained, calcareous Sm.am. Drilling mud (Metal, Plastic)
G4139	3790	0.94	50% <u>Claystone, medium to dark grey, micaceous</u> 50% Sandstone, medium to dark grey, fine-grained, micaceous, calcareous, laminated Sm.am. Drilling deposits (Casing Cement, Metal)
G4140	3802	5.21	90% <u>Sandstone, medium to dark grey, micaceous, fine-grained, calcareous</u> 10% Claystone, medium to dark grey, micaceous
G4141	3811.00 (swc)	3.38	100% Claystone, dark grey, micaceous, calcareous
G4142	3816.00 (core)	4.40	100% Claystone, dark grey, micaceous, slightly calcareous
G4143	3816.38 (core)	3.23	100% Mudstone, dark grey
G4144	3816.80 (core)	3.80	100% Claystone, dark grey, micaceous
G4145	3817.20 (core)	3.79	100% Shale, dark grey

Table 4 *Lithology and total organic carbon measurements*
 Well no. 6406/12-1S. The underlined lithology is used for analyses.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4146	3823	0.92	95% <u>Claystone, dark grey, micaceous, laminated in parts</u> 5% Claystone, reddish brown, micaceous Sm.am. Sandstone, light grey, fine-grained, carbonaceous
G4147	3832	1.16	100% <u>Claystone, dark grey, micaceous, laminated</u> Sm.am. Claystone (reddish brown, micaceous), Fibres, Metal
G4148	3844	1.07	95% <u>Claystone, dark grey, micaceous, laminated</u> 5% Mudstone (cave), dark grey Sm.am. Claystone (reddish brown, micaceous), Metal, Plastic
G4149	3850	0.94	90% <u>Claystone, medium to dark grey, micaceous, laminated</u> 10% Claystone, reddish brown, micaceous Sm.am. Carbonate (white) Metal, Plastic
G4150	3862.00 (swc)	1.39	100% Claystone, dark grey, micaceous, calcareous
G4151	3871	0.83	80% <u>Claystone, dark grey, micaceous</u> 20% Sandstone, dark grey, fine-grained, calcareous, micaceous Sm.am. Claystone (reddish brown, micaceous), Metal, Plastic
G4152	3877		90% Claystone, dark grey, micaceous, laminated 10% Sandstone, light brown, fine-grained, micaceous, calcareous Sm.am. Claystone (reddish brown, micaceous), Metal, Plastic
G4153	3880	1.06	85% <u>Claystone, dark grey, micaceous</u> 15% Sandstone, light brown, fine-grained, micaceous, calcareous Sm.am. Metal, Plastic
G4154	3892	0.84	90% <u>Claystone, dark grey, micaceous</u> 10% Sandstone, light brown, fine-grained, micaceous, calcareous Sm.am. Coal

Table 4 *Lithology and total organic carbon measurements*
Well no. 6406/12-1S. The underlined lithology is used for analyses.

Sample	Depth (m)	TOC (% of rock wt)	Lithology
G4155	3937	95% 5%	Claystone, dark grey, micaceous Sandstone, light brown, fine-grained, micaceous, calcareous Sm.am. Metal
G4156	3937 (swc)	100%	Claystone, dark grey, micaceous, laminated

Table 5 Vitrinite reflectance data.

Well number: 6406/12-1S
Reference number: 22.2036
(1/2)

IKU NO	LOCATION	DEPTH (M)	VITRINITE REFLECTANCE	REL RAT	STANDARD DEVIATION	FLUORESCENCE
G-4062	-----	1000	0.23 (4) 0.86 (4)	P R	0.08 0.19	1-2,4
G-4063	-----	1100	0.25 (9)	F	0.08	1
G-4064	-----	1200	0.24 (29) 0.63 (1)	G R	0.08 0.00	1-3
G-4065	-----	1300	0.29 (23) 0.66 (1)	G R	0.07 0.00	1-2,4
G-4067	-----	1500	0.32 (17)	G	0.09	1-2
G-4068	-----	1600	0.31 (16)	G	0.09	1-2
G-4070	-----	1800	0.39 (4)	P	0.07	1-2,4
G-4071	-----	1900	0.33 (25)	G	0.09	2,4-5
G-4072	-----	2000	0.45 (9) 0.87 (1)	P R	0.08 0.00	1-2
G-4073	-----	2100	0.40 (18)	G	0.09	1-5
G-4074	-----	2200	0.34 (25) 0.84 (5)	F R	0.08 0.12	2-3,7
G-4076	-----	2300	0.36 (16) 0.72 (7)	F R	0.05 0.13	1-3,5-6
G-4077	-----	2350	0.42 (19) 0.96 (1)	F R	0.14 0.00	2,4
G_4078	-----	2400	0.42 (13) 0.85 (8)	F R	0.09 0.15	2,4-5
G-4080	-----	2500	0.34 (13) 0.62 (7)	F R	0.07 0.07	2-3
G-4082 (SWC)	-----	2565	0.95 (1)	R	0.00	2-3,5,7

REL RAT (Reliability Rating): G = Good; F = Fair; P = Poor;
R = Reworked material.

Table 5 Vitrinite reflectance data.

Well number: 6406/12-1S
Reference number: 22.2036
(2/2)

IKU NO	LOCATION	DEPTH (M)	VITRINITE REFLECTANCE	REL RAT	STANDARD DEVIATION	FLUORESCENCE
G-4085 (SWC)	-----	2670	0.34 (6) 0.99 (8)	P R	0.06 0.24	2-4
G-4087 (SWC)	-----	2719	0.49 (8) 0.91 (9)	P R	0.08 0.15	2-3
G-4090 (SWC)	-----	2830	0.49 (2)	P	0.03	2-3,6-7
G-4092	-----	2900	0.54 (8) 0.97 (6)	P R	0.13 0.20	2-3,6
G-4095 (SWC)	-----	3035	0.34 (11) 0.67 (6) 1.09 (1)	P R R	0.07 0.15 0.00	2-4,7
G-4098 (SWC)	-----	3140	0.44 (11) 0.82 (5)	P R	0.11 0.10	3-4,6
G-4101	-----	3250	N.D.P.	-	----	abs
G-4104 (SWC)	-----	3387	0.19 (1) 0.96 (3)	S R	0.00 0.13	abs
G-4107 (SWC)	-----	3465	0.49 (5) 0.92 (4)	P R	0.13 0.16	4
G-4109 (SWC)	-----	3550	1.15 (2)	R	0.00	abs
G-4122	-----	3652	0.53 (13) 0.98 (1)	F R	0.13 0.00	2,4-5
G-4133	-----	3742	0.60 (28) 1.06 (2)	G R	0.13 0.09	2-6
G-4150	-----	3862	0.64 (8) 0.97 (5)	P R	0.09 0.13	4-6
G-4156 (SWC)	-----	3937	0.27 (1) 0.55 (34)	S G	0.00 0.11	3-6

REL RAT (Reliability Rating): G = Good; F = Fair; P = Poor;
R = Reworked material.

Table 6 Data from rock eval pyrolysis.

IKUNO	FRAC NAME	DEPTH (m)	SAMPLE TYPE	S1 (mg/g rock)	S2	TOC (%)	HYDRO. INDEX (mg/g TOC)	PETR. POTEN. S1+S2	PROD. INDEX S1 S1+S2	Tmax (°C)
6406/12-1S										
G4112		3603.26	CORE	0.72	0.39	-1		1.11	0.65	426
G4113		3608.00	CORE	0.80	0.37	-1		1.17	0.68	425
G4114		3613.00	CORE	0.83	0.41	-1		1.24	0.67	427
G4115		3618.00	CORE	2.20	0.67	-1		2.87	0.77	420
G4116		3623.00	CORE	0.12	0.25	-1		0.37	0.32	431
G4117		3628.00	CORE	0.02	0.10	-1		0.12	0.17	440
G4118		3633.00	CORE	0.04	0.22	-1		0.26	0.15	441
G4119		3637.64	CORE	0.08	0.40	-1		0.48	0.17	436
G4120		3640	CUT W	0.00	0.18	1.04	17	0.18	0.00	438
G4121		3646	CUT W	0.01	0.25	0.78	32	0.26	0.04	434
G4454		3648.0	SWC	0.21	0.87	1.16	75	1.08	0.19	431
G4122		3652	CUT W	0.00	0.19	1.15	17	0.19	0.00	437
G4455		3656.0	SWC	0.74	3.02	2.42	125	3.76	0.20	435
G4123		3664	CUT W	0.10	0.75	1.01	74	0.85	0.12	437
G4124		3670	CUT W	0.07	0.70	1.33	53	0.77	0.09	440
G4456		3675.0	SWC	0.83	4.80	3.64	132	5.63	0.15	434
G4125		3679	CUT W	0.00	0.20	1.10	18	0.20	0.00	436
G4126		3685	CUT W	0.86	7.56	3.42	221	8.42	0.10	438
G4127		3691	CUT W	0.02	0.34	1.11	31	0.36	0.06	434
G4129		3703	CUT W	0.01	0.32	0.88	36	0.33	0.03	435
G4130		3714.0	SWC	0.89	4.80	3.19	150	5.69	0.16	436
G4131		3727.0	SWC	1.76	14.81	5.51	269	16.57	0.11	435
G4132		3739	CUT W	0.01	0.32	1.16	28	0.33	0.03	436
G4134		3748	CUT W	0.02	0.29	1.10	26	0.31	0.06	437
G4135		3751.4	SWC	0.01	0.45	1.44	31	0.46	0.02	430
G4136		3760	CUT W	1.67	16.06	6.43	250	17.73	0.09	441
G4137		3775	CUT W	1.79	17.51	6.79	258	19.30	0.09	440
G4139		3790	CUT W	0.01	0.31	0.94	33	0.32	0.03	436
G4140		3802	CUT W	1.18	8.47	5.21	163	9.65	0.12	442
G4141		3811.0	SWC	0.67	5.72	3.38	169	6.39	0.10	443
G4142		3816.00	CORE	1.51	12.43	4.40	283	13.94	0.11	446
G4143		3816.38	CORE	1.47	4.49	3.23	139	5.96	0.25	437
G4144		3816.80	CORE	1.20	8.55	3.80	225	9.75	0.12	444
G4145		3817.20	CORE	1.11	8.90	3.79	235	10.01	0.11	445
G4146		3823	CUT W	0.01	0.25	0.92	27	0.26	0.04	436
G4147		3832	CUT W	0.02	0.18	1.16	16	0.20	0.10	438
G4148		3844	CUT W	0.04	0.39	1.07	36	0.43	0.09	435
G4149		3850	CUT W	0.02	0.34	0.94	36	0.36	0.06	436
G4150		3862.0	SWC	0.22	1.13	1.39	81	1.35	0.16	440
G4151		3871	CUT W	0.00	0.20	0.83	24	0.20	0.00	437
G4153		3880	CUT W	0.06	0.71	1.06	67	0.77	0.08	445
G4154		3892	CUT W	0.02	0.31	0.84	37	0.33	0.06	436

Legend

-1 - No data available.

Table 7: Pyrolysis GC data (S2 peak) as percentage of total area for well 6406/12-1S.

Sample	Depth (m)	Sample type	Lithology	C ₁	C ₂ -C ₅	C ₆ -C ₁₄	C ₁₅₊	S2 from Rock-Eval
G4123	3664	cuttings	clayst.	9.66	31.27	50.79	8.28	0.75
G4126	3685	cuttings	sandst.	4.95	18.17	34.45	42.43	7.56
G4131	3727.0	swc	clayst.	5.38	18.08	29.11	47.43	14.81
G4136	3760	cuttings	sandst.	4.97	17.44	29.08	48.52	16.06
G4142	3816.00	core	clayst.	5.42	17.39	27.37	49.83	12.43
G4150	3862.00	swc	clayst.	11.74	32.19	46.68	9.39	1.13

Table 8: Weight of chromatographic fractions

IKUNO	FRAC NAME	DEPTH (m)	SAMPLE TYPE	ROCK EXTR. (g)	EOM (mg)	ASPH (mg)	SAT HC (mg)	ARO HC (mg)	POLAR COMP. (mg)	HC (mg)	NONHC # (mg)	TOC (%)
6406/12-1S												
G4112		3603.26	CORE	39.0	60.7	4.6	37.6	12.5	4.4	50.1	10.6	-1
G4115		3618.00	CORE	40.3	116.4	5.9	73.2	32.3	14.8	105.5	10.9	-1
G4116*		3623.00	CORE	51.2	24.3	6.0	4.2	3.4	4.7	7.6	16.7	-1
G4119*		3637.64	CORE	43.7	29.0	13.4	3.4	6.4	4.7	9.8	19.2	-1
G4123*		3664	CUT W	27.7	28.1	10.9	2.6	5.1	5.2	7.7	20.4	1.01
G4126*		3685	CUT W	11.9	22.7	11.4	1.7	3.5	4.8	5.2	17.5	3.42
G4131*		3727.0	SWC	0.7	13.6	7.4	0.6	1.1	2.4	1.7	11.9	5.51
G4136*		3760	CUT W	6.3	33.2	21.3	1.7	5.6	4.8	7.3	25.9	6.43
G4142		3816.00	CORE	28.5	131.7	69.2	12.0	21.8	11.4	33.8	97.9	4.40
G4153*		3880	CUT W	23.2	23.4	12.1	1.4	4.8	8.0	6.2	17.2	1.06

Legend:

- * - Not all the available EOM was used for MPLC.
- ? - MPLC results assumed more EOM than originally extracted.
- # - NONHC is calculated as the difference : NONHC = EOM - HC
- 1 - No data available.
- * - Not fully reliable due to low sample amounts

Table 9 Concentration of EOM and chromatographic fractions, (Weight ppm of rock)

IKUNO	FRAC NAME	DEPTH (m)	SAMPLE TYPE	EOM	ASPH	SAT HC	ARO HC	POLAR COMP.	HC	NONHC #

6406/12-1S										
G4112		3603.26	CORE	1555	118	964	321	113	1285	270
G4115		3618.00	CORE	2888	146	1817	801	367	2618	270
G4116*		3623.00	CORE	475	117	83	66	92	149	326
G4119*		3637.64	CORE	663	306	78	145	108	223	440
G4123*		3664	CUT W	1014	393	93	183	189	276	738
G4126*		3685	CUT W	1912	960	146	298	406	444	1468
G4131*		3727.0	SWC	18987	10331	907	1511	3358	2418	16569
G4136*		3760	CUT W	5295	3397	269	885	770	1154	4141
G4142		3816.00	CORE	4624	2429	420	765	401	1185	3439
G4153*		3880	CUT W	1011	523	60	207	347	267	744

Legend:

- # - NONHC is calculated as the difference : $NONHC = EOM - HC$
- 1 - No data available.
- * - Not fully reliable due to low sample amounts

Table 10: Concentration of EOM and chromatographic fractions, (mg/g TOC).

IKUNO	FRAC NAME	DEPTH (m)	SAMPLE TYPE	EOM	ASPH	SAT HC	ARO HC	POLAR COMP.	HC	NONHC #

6406/12-1S										
G4112		3603.26	CORE	-1	-1	-1	-1	-1	-1	-1
G4115		3618.00	CORE	-1	-1	-1	-1	-1	-1	-1
G4116*		3623.00	CORE	-1	-1	-1	-1	-1	-1	-1
G4119*		3637.64	CORE	-1	-1	-1	-1	-1	-1	-1
G4123*		3664	CUT W	100.4	38.9	9.2	18.1	18.7	27.3	73.1
G4126*		3685	CUT W	55.9	28.1	4.3	8.7	11.9	13.0	42.9
G4131*		3727.0	SWC	344.6	187.5	16.5	27.4	60.9	43.9	300.7
G4136*		3760	CUT W	82.3	52.8	4.2	13.8	12.0	18.0	64.3
G4142		3816.00	CORE	105.1	55.2	9.5	17.4	9.1	26.9	78.2
G4153*		3880	CUT W	95.4	49.3	5.6	19.6	32.7	25.2	70.2

Legend:

- # - NONHC is calculated as the difference : $NONHC = EOM - HC$
- 1 - No data available.
- * - Not fully reliable due to low sample amounts

Table 11 Composition of EOM and chromatographic fractions

IKUNO	FRAC NAME	DEPTH (m)	SAMPLE TYPE	ASPH	SAT	ARO	HC	POLAR	SAT	HC
				EOM (%)	EOM (%)	EOM (%)	EOM (%)	EOM (%)	ARO x 100	NONHC x 100

6406/12-1S										
G4112		3603.26	CORE	7.6	62.0	20.6	82.6	7.2	300.7	475.5
G4115		3618.00	CORE	5.1	62.9	27.8	90.7	12.7	226.8	973.1
G4116		3623.00	CORE	24.7	17.5	13.9	31.4	19.5	125.4	45.8
G4119		3637.64	CORE	46.2	11.8	21.9	33.7	16.3	53.8	50.9
G4123		3664	CUT W	38.8	9.2	18.1	27.3	18.6	50.8	37.4
G4126		3685	CUT W	50.2	7.6	15.6	23.2	21.2	48.9	30.2
G4131		3727.0	SWC	54.4	4.8	8.0	12.8	17.7	60.0	14.6
G4136		3760	CUT W	64.2	5.1	16.7	21.8	14.5	30.4	27.9
G4142		3816.00	CORE	52.5	9.1	16.5	25.6	8.7	54.9	34.5
G4153		3880	CUT W	51.7	5.9	20.5	26.4	34.3	28.9	35.9

Legend:

- # - NONHC is calculated as the difference : $NONHC = EOM - HC$
- 1 - No data available.
- * - Not fully reliable due to low sample amounts

Table 12 Ratios derived from gas chromatograms of saturated hydrocarbons

IKUNO	FRAC NAME	DEPTH	Pri	Pri	Phy	A	n-C17	n-C31	CPI 1 (*)	CPI 2
			Phy	A= n-C17	B= n-C18	B	n-C27	n-C19		

6406/12-1S										
G4112		3603.26	2.6	0.7	0.3	2.3	1.6	0.3	1.1	1.1
G4115		3618.00	2.1	0.7	0.3	2.1	1.4	0.3	1.2(1.1)	1.1
G4116		3623.00	2.7	0.6	0.3	1.6	14.9	0.1	3.0(1.0)	0.9
G4119		3637.64	3.4	1.1	0.5	2.3	5.6	0.1	1.2	1.1
G4123		3664	2.4	1.8	1.0	1.8	1.6	0.8	1.2	1.2
G4126		3685	3.0	2.2	0.9	2.3	2.8	0.2	1.3	1.2
G4131		3727.0	3.2	1.8	0.7	2.7	1.8	0.4	4.9(1.3)	1.2
G4136		3760	4.4	2.6	0.7	3.7	1.4	0.3	1.3	1.2
G4142		3816.00	4.7	1.5	0.4	3.3	1.6	0.3	2.4(1.3)	1.2
G4153		3880	4.4	1.3	0.3	3.8	1.9	0.2	1.2	1.2

$$CPI1 = \frac{1}{2} * \left(\frac{C25+C27+C29+C31}{C24+C26+C28+C30} + \frac{C25+C27+C29+C31}{C26+C28+C30+C32} \right)$$

$$CPI2 = 2 * C27 / (C26+C28)$$

Ratios involving pristane and phytane are calculated from peak areas.
All other ratios are calculated from peak heights.

(*) - Due to coelution of nC₂₅ with solvent contamination peak, CPI has been calculated with nC₂₅ estimated as 0.5*(nC₂₃+nC₂₇) for four samples.
The new values are given in parentheses.

Table 13 Ratios derived from gas chromatograms of aromatic hydrocarbons.

IKU no.	Depth (m)	MPI 1	MPI 2
G4112	3603.26	0.71	0.71
G4115	3618.00	0.71	0.82
G4116	3623.00	0.70	0.73
G4119	3637.64	0.58	0.64
G4123	3664	0.51	0.53
G4126	3685	0.50	0.55
G4131	3727.0	0.49	0.53
G4136	3760	0.52	0.55
G4142	3816.00	0.51	0.53
G4153	3880	0.54	0.58

$$\text{MPI 1: } \frac{1.5 (2\text{-MP}+3\text{-MP})}{\text{P}+1\text{-MP}+9\text{-MP}}$$

$$\text{MPI 2: } \frac{3 (2\text{MP})}{\text{P}+1\text{-MP}+9\text{MP}}$$

Table 14 Molecular ratios from sterane and terpane mass chromatograms.
Maturity ratios.

IKU code	Depth (m)	$\alpha\beta/\alpha\beta+\beta\alpha$ ¹⁾	%22S ²⁾	% $\beta\beta$ ³⁾	%20S ⁴⁾
G4112	3603.26	0.89	60.4	69.7	46.1
G4115	3618.00	0.89	60.6	69.9	49.7
G4126	3685	0.82	61.8	58.3	45.4
G4131	3727.0	0.85	62.4	58.8	55.7
G4142	3816.00	0.85	58.2	63.0	48.6

1) E/E+F in m/z 191.

2) Average % distribution between first and second eluting isomers of extended hopanes (G-M in m/z 191).

3) $2(r+s)/(q+t+2(r+s))$ in m/z 217.

4) $q/q+t$ in m/z 217.

Table 15 Molecular ratios from terpane and sterane mass chromatograms.
Maturity and source characteristic ratios.

IKU code	Depth (m)	Q/E ¹⁾	Tm/Ts ²⁾	X/E ³⁾	Z/E ⁴⁾	a/a+j ⁵⁾
G4112	3603.26	0.05	1.14	0.16	-	0.75
G4115	3618.00	0.06	0.89	0.19	-	0.78
G4126	3685	0.00	5.76	0.05	-	0.67
G4131	3727.0	0.02	3.74	0.08	-	0.73
G4142	3816.00	0.00	11.5	0.08	-	0.72

- 1) Relative abundance of tricyclic terpanes (Q/E in m/z 191).
 2) B/A in m/z 191.
 3) Relative abundance of unknown (X/E in m/z 191).
 4) Relative abundance of bisnorhopane (Z/E in m/z 191).
 5) Relative abundance of C₂₇ rearranged steranes (a/a+j in m/z 217).

Table 16 GC/MS data from aromatic fraction, molecular ratios.

IKU no./ Depth (m)	sum 231 ²⁾		M ³⁾	M+N ⁴⁾	O ⁵⁾	R ⁶⁾	S ¹⁾
	sum 231	sum 253	M?S	(M+N)+O+P+Q+R+S)	Q	S	S+(1+m)
G4112	3603.26	0.65	0.64	0.32	0.54	0.80	0.89
G4115	3618.00	0.45	0.58	0.30	0.57	0.91	0.57
G4126	3685	0.47	0.44	0.18	0.81	1.07	0.57
G4131	3727.0	0.61	0.39	0.19	0.47	0.59	0.83
G4142	3816.00	0.54	0.52	0.30	0.46	0.50	0.76

- 1) C₂₈ 20R triaromatic sterane/(SAME+C₂₉ 20R monoaromatic sterane) in m/z 231 and 253.
- 2) SUM triaromatic steranes/(SAME+SUM monoaromatic steranes).
- 3) C₂₀ triaromatic sterane/(SAME+C₂₈ 20R triaromatic sterane) in m/z 231.
- 4) C₂₀+C₂₁ triaromatic sterane/(SAME+SUM C₂₆-C₂₈ triaromatic steranes) in m/z 231.
- 5) C₂₆ 20S triaromatic sterane/C₂₈ 20S triaromatic sterane in m/z 231.
- 6) C₂₇ 20R triaromatic sterane/C₂₈ 20R triaromatic sterane in m/z 231.

IKU no.	Depth (m)	m/z 178 and 192 $\frac{3MP+2MP}{9MP+1MP}$	MPI-1 ⁷⁾
G4112	3603.26	0.75	0.48
G4115	3618.00	0.69	0.53
G4126	3685	0.68	0.34
G4131	3727.0	0.62	0.35
G4142	3816.00	0.69	0.37

7) MPI-1=1.5 [(3MP+2MP)/(P+9MP+1MP)].

Key for m/z 217 and 218 (steranes):

Peak code	Identification	Formula
u	5 α (H)-sterane	C ₂₁ H ₃₆
v	5 α (H)-sterane	C ₂₂ H ₃₈
a	13 β (H),17 α (H)-diasterane (20S)	C ₂₇ H ₄₈
b	13 β (H),17 α (H)-diasterane (20R)	C ₂₇ H ₄₈
c	13 α (H),17 β (H)-diasterane (20S)	C ₂₇ H ₄₈
d	13 α (H),17 β (H)-diasterane (20R)	C ₂₇ H ₄₈
e	13 β (H),17 α (H)-diasterane (20S)	C ₂₈ H ₅₀
f	13 β (H),17 α (H)-diasterane (20R)	C ₂₈ H ₅₀
g	13 α (H),17 β (H)-diasterane (20S)	C ₂₈ H ₅₀
	+ 14 α (H),17 α (H)-sterane (20S)	C ₂₇ H ₄₈
h	13 β (H),17 α (H)-diasterane (20S)	C ₂₉ H ₅₂
	+ 14 β (H),17 β (H)-sterane (20R)	C ₂₇ H ₄₈
i	14 β (H),17 β (H)-sterane (20S)	C ₂₇ H ₄₈
	+ 13 α (H),17 β (H)-diasterane (20R)	C ₂₈ H ₅₀
j	14 α (H),17 α (H)-sterane (20R)	C ₂₇ H ₄₈
k	13 β (H),17 α (H)-diasterane (20R)	C ₂₉ H ₅₂
l	13 α (H),17 β (H)-diasterane (20S)	C ₂₉ H ₅₂
m	14 α (H),17 α (H)-sterane (20S)	C ₂₈ H ₅₀
n	13 α (H),17 β (H)-diasterane (20R)	C ₂₉ H ₅₂
	+ 14 β (H),17 β (H)-sterane (20R)	C ₂₈ H ₅₀
o	14 β (H),17 β (H)-sterane (20S)	C ₂₈ H ₅₀
p	14 α (H),17 α (H)-sterane (20R)	C ₂₈ H ₅₀
q	14 α (H),17 α (H)-sterane (20S)	C ₂₉ H ₅₂
r	14 β (H),17 β (H)-sterane (20R)	C ₂₉ H ₅₂
	+ unknown sterane	
s	14 β (H),17 β (H)-sterane (20S)	C ₂₉ H ₅₂
t	14 α (H),17 α (H)-sterane (20R)	C ₂₉ H ₅₂
*	diasterenes	

Key for m/z 191, 205 (terpanes):

Peak code	Identification	C-atoms : double bonds
P	C ₂₃ tricyclic terpane	(C ₂₃ :0)
Q	C ₂₄ tricyclic terpane	(C ₂₄ :0)
R	C ₂₅ tricyclic terpane (17R,17S)	(C ₂₅ :0)
S	C ₂₄ tetracyclic terpane	(C ₂₄ :0)
T	C ₂₆ tricyclic terpane (17R,17S)	(C ₂₆ :0)
A	18 α (H)-trisorneohopane, Ts (?)	(C ₂₇ :0)
B	17 α (H)-trisnorhopane, Tm	(C ₂₇ :0)
C	17 α (H), 21 β (H)-norhopane	(C ₂₉ :0)
D	17 β (H), 21 α (H)-norhopane (= normoretane)	(C ₂₉ :0)
E	17 α (H), 21 β (H)-hopane	(C ₃₀ :0)
F	17 β (H), 21 α (H)-hopane (= moretane)	(C ₃₀ :0)
G	17 α (H), 21 β (H)-homohopane (22S)	(C ₃₁ :0)
H	17 α (H), 21 β (H)-homohopane (22R)	(C ₃₁ :0)
I	17 β (H), 21 α (H)-homohopane (= homomoretane)	(C ₃₁ :0)
J	17 α (H), 21 β (H)-bishomohopane (22S,22R)	(C ₃₂ :0)
K	17 α (H), 21 β (H)-trishomohopane (22S,22R)	(C ₃₃ :0)
L	17 α (H), 21 β (H)-tetrakishomohopane (22S,22R)	(C ₃₄ :0)
M	17 α (H), 21 β (H)-pentakishomohopane (22S,22R)	(C ₃₅ :0)

Key for m/z 231 (tri-aromatic steroids):

Peak code	Identification
M	C ₂₀ tri-aromatic steroid
N	C ₂₁ tri-aromatic steroid
O	C ₂₆ tri-aromatic steroid
P	C ₂₆ +C ₂₇ tri-aromatic steroids
Q	C ₂₈ tri-aromatic steroid
R	C ₂₇ tri-aromatic steroid
S	C ₂₈ tri-aromatic steroid

Key for m/z 253 (mono-aromatic steroids):

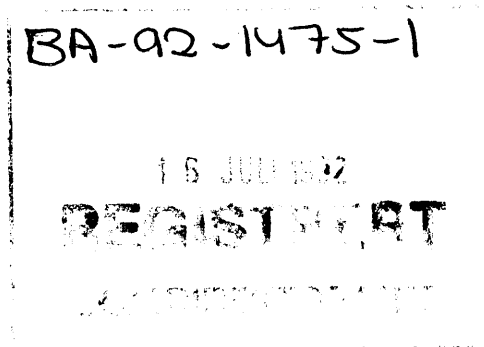
Peak code	Identification
a	C ₂₁ mono-aromatic steroid
b	C ₂₂ mono-aromatic steroid
c	unidentified compound
d	C ₂₇ mono-aromatic steroid
e	C ₂₇ mono-aromatic steroid
f	C ₂₈ mono-aromatic steroid
g	C ₂₇ mono-aromatic steroid
h	C ₂₈ +C ₂₉ mono-aromatic steroids
i	C ₂₉ mono-aromatic steroids
j	C ₂₉ mono-aromatic steroids
k	unidentified compound
l	unidentified compound



EP/S/EXP/LAB n°91/201 RP

Pau, april 15, 1992

WELL 6406/12-1S (NORWAY)
PALYNOLOGICAL AND GEOCHEMICAL
STUDY OF JURASSIC SERIES



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LEGENDS OF TABLES AND FIGURES OF ORGANIC INVENTORY ANALYSES : ABBREVIATIONS, UNITS AND CUT OFFS

SAMPLE TYPE : ND=unwashed cuttings; DE=cuttings washed on site..... [the ND are washed and the DE are washed anew in the laboratory]
 CA=core; CL=sidewall core; TE=outcrop; BO=mud; XX=other or undetermined
 IR : Insoluble residue after HCl attack (% weight of rock)

TOC : Total organic carbon (% weight of rock) [measured with Rock Eval+TOC analyser or LECO]
 IOC : Insoluble organic carbon in chloroform (% weight of rock) Id.
 OC : Organic carbon (total or insoluble)

X-RAY DIFF. : ALBite ; ORThoclase ; ANHydrite (or chlorite/kaolinite) ; QuaRtZ ; CALcite ; DOLomite ; SIDerite ; UNDoled (% weight of rock)

ROCK EVAL Carried out on : [generally not performed if OC < .3%]

ANALYSIS
 RT : Total rock
 RI_RT : Insoluble residue after HCl attack
 RE : Rock extracted with chloroform
 RI_RE : Rock extracted with chloroform, and after HCl attack
Measured parameters : [# : result not given because meaningless; <S : lower than the detection threshold]
 Tmax : Temperature of S2 peak (°C) [meaningless if S2 small]
 S1 : Free hydrocarbons in the rock (mgHC/g of rock) [meaningless if the analysis is performed on the extracted rock]
 S2 : Hydrocarbons yielded by pyrolysis (mgHC/g of rock)
 S3 : CO2 yielded by pyrolysis (mg CO2/g of rock)
Calculated parameters :
 PI : Production Index= S1/(S1+S2) [# : meaningless if S1 and S2 < .2]
 HI : Hydrogen Index = (S2/OC)x100 (mg HC/g OC)
 OI : Oxygen Index = (S3/OC)x100 (mg CO2/g OC) .. [to be used with caution for analyses carried out on RT or RE if OC < 2%;
 IO>170 : mineral contribution to S3 peak]

EXTRACT EOM: extractable organic matter with chloroform (% per weight of rock) [<S if lower than .01 %]
ANALYSIS Normalized composition of the extract (% EOM) [generally not performed if EOM < .03 %]
 SAT: Saturated hydrocarbons
 ARO: Aromatic hydrocarbons
 POL: Polar compounds (Resins+Asphaltenes)
 HC: SAT+ARO (mg HC/g of rock)

Q1: Contaminations or cavings, affecting the Rock Eval and TOC analyses | I=high; M=medium; F=low;
 Q2: Contaminations or cavings, affecting the organic extract | N=null or not detected; U=unknown

TABLE: 1

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DESCRIPTION OF ANALYSED SAMPLES AND ORGANIC CARBON CONTENT

LAB. REF.	SAMPLE TYPE	DEPTHS Metres	IR %	TOC %	IOC %	L I T H O L O G Y
B39866	DE	3649.00		.80		SHALE, DARK GREY, SILTY
B39867	DE	3664.00		.86		SHALE, DARK GREY, SILTY
B39868	DE	3688.00		1.50		SHALE, DARK GREY, SILTY
B39869	DE	3715.00		1.47		SHALE, DARK GREY, SILTY
B39870	DE	3739.00		1.56		SHALE, DARK GREY, SILTY, SLIGHTLY CALCAREOUS
B39871	DE	3760.00		1.74		SHALE, DARK GREY, SILTY, SLIGHTLY CALCAREOUS
B39872	DE	3784.00		1.78		SHALE, DARK GREY, SILTY, CALCAREOUS
B39873	DE	3808.00		1.66		SHALE, DARK GREY, SILTY, CALCAREOUS
B39874	DE	3844.00		.95		SHALE, DARK GREY, SILTY
B39875	DE	3850.00		1.07		SHALE, DARK GREY, SILTY
B39876	DE	3880.00		1.23		SHALE, DARK GREY, SILTY, SLIGHTLY CALCAREOUS
B39877	DE	3910.00		2.34		SHALE, DARK GREY, SILTY, SLIGHTLY CALCAREOUS
B39878	DE	3934.00		1.47		SHALE, DARK GREY, SILTY, SLIGHTLY CALCAREOUS
B39879	DE	3964.00		1.19		SHALE, DARK GREY, SILTY, SLIGHTLY CALCAREOUS

TABLE: 2

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MINERALOGICAL COMPOSITION BY X-RAY DIFFRACTION

LAB. REF.	SAMPLE TYPE	DEPTHS Metres	IR %	TOC %	IOC %	ALB %	ORT %	ANH %	QRZ %	CAL %	DOL %	SID %	ND %
B39866	DE	3649.00		.80		3	2	0	24	0	1	1	69
B39867	DE	3664.00		.86		6	2	1	26	1	0	1	63
B39868	DE	3688.00		1.50		7	0	0	30	1	1	0	61
B39869	DE	3715.00		1.47		6	0	1	27	0	4	1	61
B39870	DE	3739.00		1.56		5	1	0	34	5	3	1	51
B39871	DE	3760.00		1.74		3	1	0	34	5	7	1	49
B39872	DE	3784.00		1.78		2	0	0	24	13	5	2	54
B39873	DE	3808.00		1.66		2	2	0	21	18	1	3	53
B39874	DE	3844.00		.95		6	0	2	20	1	0	1	70
B39875	DE	3850.00		1.07		3	0	2	20	4	0	2	69
B39876	DE	3880.00		1.23		3	0	0	17	9	0	7	64
B39877	DE	3910.00		2.34		3	0	0	20	9	1	3	64
B39878	DE	3934.00		1.47		1	0	0	23	8	1	3	64
B39879	DE	3964.00		1.19		2	0	0	22	3	1	3	69

TABLE: 3

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RESULTS OF ORGANIC INVENTORY ANALYSIS

LAB. REF.	SAMPLE TYPE	DEPTHS Metres	R O C K - E V A L									EXTRACT ANALYSIS									
			Q1	on	Tmax	S1	S2	S3	PI	HI	OI	TOC	IOC	Q2	EOM	100(EOM/TOC)	SAT	ARO	POL	SAT/ARO	HC
B39866	DE	3649.00	N	RT	428	.05	.37	.29	.12	46	36	.80		N	.039	4.8	19.1	24.1	56.7	.79	.17
B39867	DE	3664.00	N	RT	433	.10	.62	.49	.14	72	57	.86		N	.085	9.9	18.3	25.1	56.5	.73	.37
B39868	DE	3688.00	N	RT	433	.42	1.89	.67	.18	126	45	1.50		N	.242	16.1	27.7	25.0	47.3	1.11	1.27
B39869	DE	3715.00	N	RT	432	.26	1.52	.63	.15	103	43	1.47		N	.182	12.4	18.9	29.4	51.7	.64	.88
B39870	DE	3739.00	N	RT	433	.26	1.42	.59	.15	91	38	1.56		N	.169	10.9	14.3	29.4	56.3	.49	.74
B39871	DE	3760.00	N	RT	435	.30	1.77	.59	.14	102	34	1.74		N	.183	10.5	10.8	28.6	60.6	.38	.72
B39872	DE	3784.00	N	RT	437	.19	1.04	.97	.15	58	54	1.78		N	.137	7.7	10.5	30.5	58.9	.35	.56
B39873	DE	3808.00	N	RT	438	.22	1.07	.84	.17	64	51	1.66		N	.153	9.2	20.6	27.0	52.4	.76	.73
B39874	DE	3844.00	N	RT	433	.05	.34	.57	.13	36	60	.95		N	.058	6.1	33.4	20.3	46.2	1.65	.31
B39875	DE	3850.00	N	RT	436	.08	.47	.65	.15	44	61	1.07		N	.077	7.2	30.3	23.7	46.0	1.28	.42
B39876	DE	3880.00	N	RT	434	.13	.55	1.60	.19	45	130	1.23		N	.104	8.4	22.7	26.3	51.0	.86	.51
B39877	DE	3910.00	N	RT	433	.38	2.46	3.01	.13	105	129	2.34		N	.252	10.8	18.2	25.5	56.3	.71	1.10
B39878	DE	3934.00	N	RT	436	.19	.85	1.72	.18	58	117	1.47		N	.158	10.7	23.2	23.4	53.4	.99	.73
B39879	DE	3964.00	N	RT	434	.61	2.46	3.22	.20	207	>170	1.19		N	.433	36.4	21.2	20.0	58.8	1.06	1.78

: 6406/12-1 (6406/12-1)

Estimation of maceral composition

SAMPLE REFERENCE	SAMPLE DEPTHS		SAMP. ECH	PREPA. TYPE	VITRINITE	EXINITE	INERTINITE
	Higher (M)	Lower					
P910140B40858	3610.10		CA	MO	5-25%	< 5%	50-75%
P910140B40859	3616.00		CA	MO			>75%
P910140B40860	3627.60		CA	MO	< 5%	< 5%	>75%
P910140B40861	3630.15		CA	MO	5-25%	< 5%	>75%
P910140B40369	3652.00		DE	MO	50-75%	< 5%	25-50%
P910140B40370	3805.00		DE	MO	25-50%	< 5%	50-75%

"Sample Type" Codes.....: CA = core; CL = SWC; DE = cuttings; ND = muddy cuttings

"Preparation Type" Codes: MO = organic matter concentrate; RP = whole rock

Vitrinite reflectance measurements

SAMPLE REFERENCE	SAMPLE DEPTHS (M)		SAMP. ECH	PREPA. TYPE	NUMBER READINGS	RANGE	MEAN	STD.- DEV.	MODE
P910140B40858	3610.10		CA	MO	6	.50- .70	.59	.05	.55
P910140B40860	3627.60		CA	MO	19	.56- .70	.60	.04	.55
P910140B40861	3630.15		CA	MO	19	.60- .80	.65	.05	.6
P910140B40369	3652.00		DE	MO	29	.45- .80	.62	.05	.65
P910140B40370	3805.00		DE	MO	30	.50- .85	.67	.06	.65
P910140B40371	3961.00		DE	MO	30	.50- .80	.66	.06	.7

"Sample Type" Codes.....: CA = core; CL = SWC; DE = cuttings; ND = muddy cuttings

"Preparation Type" Codes.: MO = organic matter concentrate; RP = whole rock

"Mode" Codes.....: * = undetermined; ** = bimodal