

**FINAL WELL REPORT
WELL 35/10-2 & 2T2
PL173**



CONFIDENTIAL

Document no.: 97001549

Rev. no.: 0

Date : 03.02.97

FMT run1A

Point no.	Depth m MD RKB	Drawdown pressure kPa	Formation pressure kPa	Hydr. Before kPa	Hydr. After kPa	Mob. md/cp	Temp. °C	Comment
2	2015,10	8480	-	29990	29980	-	65	Tight

Table 3.3.1 FMT results, run 1A

FMT run 3A

Pnt. no.	Depth m MD RKB	Drawdown pressure kPa	Formation pressure kPa	Hydr. Before kPa	Hydr. After kPa	Mob. md/cp	Temp. °C	Comment
1	4152,90	44704		75563	75617	1,40	128,80	Tight
2	4151,90	56448	72930	75592	75673	0,80	132,00	Superch.?
3	4153,90	52887		75662	75689	0,50	132,70	Tight
4	4154,90	49386		75712	75727	0,40	133,50	Tight
5	4152,40	51296	72904	75639	75703	1,20	134,00	Superch.?
6	4155,90	48361		75710	75720	0,40	134,20	Tight
7	4157,00	47567		75714	75745	0,40	134,90	Tight
8	4151,40	52227		75556	75593	0,50	135,60	Tight
9	4152,20	59801	72891	75648	75682	1,50		Superch.?

Table 3.3.2 FMT results, run 3A

FMT run 4C

Pnt. no.	Depth m MD RKB	Drawdown pressure kPa	Formation pressure kPa	Hydr. Before kPa	Hydr. After kPa	Mob. md/cp	Temp. °C	Comment
1	4150,50	52438	73158	74605	74504	0,80	134	Superch.
2	4152,80	48697	73840	74560	74450	0,70	134	Superch.
3	4158,20	60800	73833	74591	74531	1,80	135	Superch.
4	4161,90			74620				No Seal
5	4162			74598				No Seal
6	4165,40	51673	74361	74676	74688	0,80	135	Superch.
7	4168,70	45855		74684	74662	1,00		Tight
8	4168			74597			136	No Seal
9	4172,50	54621	73416	74716	74723	1,30	136,50	Superch.
10	4190,80			75030			137	No Seal
11	4199,20	57066	72774	75221	75144	1,20	137,50	Moderate

**FINAL WELL REPORT
WELL 35/10-2 & 2T2
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12	4207,40	47937		75364	75298	1,10	138	Tight
13	4208,50	41753		75325	75290		138	Tight
14	4209,50	42972		75333	75293		139	Tight
15	4217,90	72690	72789	75558	75381	23,10	140	Good
16	4221,50	65181	72870	75498	75414	2,40	141	Fair
17	4223,50	72414	72902	75473	75438	66,60	141	Good
18	4225,50	72276	74000	75508	75464	13,30	141	Questionable
19	4237			75765				No Seal
20	4245,50	72391	74222	75927	75904	20,40	142	Superch.
21	4250,60	61528	74171	75999	75913	1,50	142,40	Superch.
22	4255,50			76041				No Seal
23	4258			76085			142,50	No Seal
24	4260			76115			142,60	No Seal
25	4334,70		79990	77765	77696	0,00	143	Superch.
26	4334,80	70838	74046	77677	77618	12,40	144	Good
27	4338,80			77654			145,20	No Seal
28	4340			77732			144,70	No Seal
29	4345,30			77782			145,70	No Seal
30	4368	71614	76213	78298	78467	5,10	147	Superch.
31	4380	73591	74475	78465	78415	72,50	148	Good
32	4383	73032	74502	78491	78453	18,50	148,50	Good
33	4390,80	73287	74580	78645	78618	40,30	149	Good
34	4395	73194	74621	78699	78676	39,60	149	Good
35	4403	68997	74712	78840	78807	4,20	149	Good
36	4435,20	77760	79914	79460	79520	43,90	150	Superch.
37	4438	78462	80304	79477	79445	47,20	151	Superch.
38	4473	71221	75771	80249	80281	5,70	153,70	Fair

Table 3.3.3 *FMT results, run 4C*

**FINAL WELL REPORT
WELL 35/10-2 & 2T2
PL173**



CONFIDENTIAL

Document no.: 97001549

Rev. no.: 0 Date : 03.02.97

FMT run 4D-F

Pnt. no.	Depth m MD RKB	Drawdown pressure kPa	Formation pressure kPa	Hydr. Before kPa	Hydr. After kPa	Mob. md/cp	Temp. °C	Comment
Run 4D								
1	4150,30	57004	72932	74207	74313	1,20	138	Superch.
2	4152	53449	73069	74209	74316	1,00	138	Superch.
3	4157,60							No Seal
4	4157,80							No Seal
5	4177,90							No Seal
6	4191							No Seal
7	4199,20	68218	72756	75165	75113	5,30	140	Good
8	4217,90	71896	72854	75543	75481	35,40	141,50	Good
9	4237,10							No Seal
10	4245,10	62562	73709	75964	75932	1,90	144,20	Fair?
11	4255,20	53399	73346	76143	76069	0,80	144,40	Superch.
12	4258							No Seal
13	4287,20	49893	51426	76799	76730		144,70	Tight
14	4383	72901	74502	78675	78581	25,00	149,30	Good
15	4473,20	49762	51907	80392	80335		154,20	Tight
16	4199,20	58728	72726	74924	74923	1,50	147,30	Good
17	4199,10							No Seal
18	4199,30	65830	72734	74895	74835	3,20	144	Good
Run 4E								
1	4199,30	65642	72735	74833	74847	3,20	143,40	Good
2	4199,30	67139	72745	74847	74824	4,30	143,10	Good
3	4199,30	68371	72693	75394	74940	7,50	141,80	Sample
Run 4F								
1	4199,30	65782	72752	75195	0	4,90	142	Sample
2	4199,30	0	72606	0	74730	0	142	Sample

Table 3.3.4 FMT results, run 4D-F

**FINAL WELL REPORT
WELL 35/10-2 & 2T2
PL173**



CONFIDENTIAL

Document no.: 97001549

Rev. no.: 0 Date : 03.02.97

FMT run 5G-H

Pnt. no.	Depth m MD RKB	Drawdown pressure kPa	Formation pressure kPa	Hydr. Before kPa	Hydr. After kPa	Mob. md/cp	Temp. °C	Comment
Run 5G								
1	4395,10	64365	74644	77424	77370	3.3	148.6	Good
2	4616,10	57726	-	81383	81325	0.9	158	Tight
3	4617,50	56667	77199	81318	81230	1.1	158.4	Poor Perm.
4	4637,50	-	-	81574	81545	-	159	No seal
5	4640,50	53613	-	81581	81567	-	159.3	Tight
6	4640,70	-	-	81542	81534	-	159.4	No seal
7	4647,60	55634	-	81642	81636	-	159.7	tight
8	4650,80	-	-	81680	81662	-	160	No seal
9	4650,50	-	-	81643	81610	-	160.2	Tight
10	4655,50	-	-	81701	81678	-	160.4	No seal
11	4655,00	-	-	81701	81678	-	160.5	No seal
12	4629,40	-	-	81863	81827	-	160.6	No seal
13	-	-	-	81033	Probe plugged w/mud	-	160.7	No seal
Run 5H								
1	4199,30	66486	72774	74128	73958	5.3	145.2	Lost seal
2	4199,30	67185	72779	73945	73516	3.3	145.2	Good
3	4616,10	62444	77000	81322	81269	1.4	159.5	Poor perm
4	4617,50	-	-	81255	81230	-	159.7	No seal
5	4634,00	55185	-	81479	81473	-	159.8	Tight
6	4635,80	-	-	81490	81473	-	159.9	No seal
7	4636,00	-	-	81465	81452	-	160	No seal
8	4629,30	-	-	81269	81258	-	160.1	No seal
9	4617,60	58065	77083	81007	80957	0.7	160.2	Poor
10	4177,00	51009	-	72984	72976	-	147.9	Tight
11	4177,00	-	-	72588	72576	-	146.1	No seal
12	-	-	-	72574	72570	-	145.5	Lost seal

Table 3.3.5 FMT results, run 5G-H

**FINAL WELL REPORT
WELL 35/10-2 & 2T2
PL173**



CONFIDENTIAL

Document no.: 97001549

Rev. no.: 0 Date : 03.02.97

MDT results, run 5A

Pnt. no.	Depth m MD RKB	Drawdown pressure kPa	Formation pressure kPa	Hydr. Before kPa	Hydr. After kPa	Mob. md/cp	Temp. °C	Comment
1	43935	60000	74562	77330	77395	34.7	147.4	Good
2	-			78850			149	No seal
3	4473.6	60000	76025	78797	78664	2.4	149.5	Supercharge
4	-			78840				No seal

Table 3.3.6 *MDT results, run 5A*

**FINAL WELL REPORT
WELL 35/10-2 & 2T2
PL173**



CONFIDENTIAL

Document no.: 97001549

Rev. no.: 0 Date : 03.02.97

FMT sampling results

Sample	4L FMT	4L FMT	4L FMT	40L FMT	Mudfiltrate
Run No	4C	4E	4F	4F	
Depth (m MD RKB)	4217.9	4199.3	4199.3	4199.3	
Opening pres. (kPa)	7000	0	1035	5850	
	Drained offshore	Drained offshore	Sent to PVT lab.	Drained offshore	
Collected Fluid Volume (litre)	3.9	3.9	3.3	37,00	
Gas Volume (m3)	0.02	0	0.02	1	
Comment	Mix. of Mud-filtrate and Form. Water	Mainly Mudfiltrate	Mainly mudfiltrate	Mainly Mudfiltrate	
Resistivity	0.565 @ 19.1 C	0.598 @ 25 C		0.567 @ 25 C	0.607@25 C
Density	1.01*	1.01		1.01	1,02
pH	6.9	7.4		7,5 at 20C	8.1
Sodium, Na (mg/l)		4400,00		4500,00	
Calcium, Ca (mg/l)		134,00		120,00	3.6
Chloride, Cl (mg/l)	4100.*	3250,00		3100,00	4000
Magnesium, Mg mg/l		16.4		12.1	78.3
Barium, Ba (mg/l)		34.1		27.5	23.6
Strontium, Sr (mg/l)		5.9		5.4	5.1
Tot. diss. solids mg/l		9030,00		8880,00	
Oil	0,00	0,00		0,00	

Table 3.3.7 FMT sampling results

* Offshore analysis

**FINAL WELL REPORT
WELL 35/10-2 & 2T2
PL173**



CONFIDENTIAL

Document no.: 97001549

Rev. no.: 0 Date : 03.02.97

FMT samples

Run	Preflush Chamber (litre)	Opening Pressure (kPa)	Collected Fluid vol (litre)	Gas Volume (m ³)	Comments
4B	20,00	5500	19,00	0,09	Mainly mudfiltrate
4D	40,00				No Sample Obtained
4E	40,00	0,00	5,00	0,00	Mudfiltrate
4F	40,00	5850	37,00	1	Mudfiltrate
5G pumpthrough	4,00	0,00	4,00	0,00	Mud

Table 3.3.8 FMT samples

**FINAL WELL REPORT
WELL 35/10-2 & 2T2
PL173**



CONFIDENTIAL

Document no.: 97001549

Rev. no.: 0 Date : 03.02.97

Compositional analysis, FMT sample run 4F at 4199.3 m

Component	weight %	mol %	molwt.
Nitrogen	14,46	9,83	
Carbon dioxide	3,50	1,52	
Methane	68,77	81,58	
Ethane	8,51	5,38	
Propane	2,51	1,08	
iso-Butane	0,43	0,14	
n-Butane	0,56	0,18	
iso-Pentane	0,24	0,06	
n-Pentane	0,19	0,05	
Hexanes	0,26	0,06	84,10
Heptanes	0,52	0,11	89,50
Octanes	0,05	0,01	103,00
Nonanes	0,00	0,00	
Decanes plus	0,00	0,00	
Sum	100,00	100,00	
Avg. molecular weight :			19,03
Gas gravity :			0,66

Table 3.3.9

Mud Properties, daily record

Well: 35/10-2 and 35/10-2T2

Operator: STATOIL

Rig: Transocean Arctic

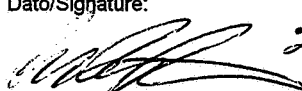
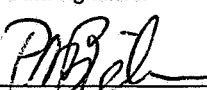
FSR no.	Date 1998	Depth m	MW sg	T °C	F.Vis s/qt	VG-meter readings @ 50 C								AV sP	PV sP	YP Pa	Gel 10 sec Pa	Gel 10 min Pa	API FL ml	HTHP FL ml	pH	ρP ml	mF ml	Cl- mg/l	TH mg/l	CA++ mg/l	KCl kg/m3	Solids vol %	Solids Corr vol %	MBT kg/m3	HGS kg/m3	LGS kg/m3	Sand %	Area 200 val %	K+	
						500 rpm	300 rpm	200 rpm	150 rpm	90 rpm	30 rpm	5	3																							
35" Section: Bartonite																																				
1	16-04	454	1,04	0	100	53	37						27	18	10,5																					
2	17-04	483	1,04	0	100	53	37						27	18	10,5																					
26" Section: Bartonite																																				
3	18-04	484	1,04		140	54	38						27	18	11,0																					
4	19-04	905	1,20		165	102	68						51	34	17,0																					
5	20-04	1439	1,20		165	102	68						51	34	17,0																					
6	21-04	1439	1,30		165	117	77						59	40	18,5																					
7	22-04	1439	1,30		165	117	77						59	40	18,5																					
8	23-04	1460	1,30		165	117	77						59	40	18,5																					
9	24-04	1460	1,30		165	117	77						59	40	18,5																					
10	25-04												0	0	0,0																					
11	26-04	1460	1,05		100	140	106						70	34	36,0																					
12	27-04	1460	1,05		100	140	106						70	34	36,0																					
17 1/2" Section: Area 2000																																				
13	28-04	1903	1,45	31	50	67	48	36	27	22	18	9	8	34	19	14,5	4,0	5,0	3,4		8,5	0,00	0,03	82 000	1180	840	165	20,4	14,7	36	387	105				
14	29-04	1960	1,45	36	48	66	48	43	30	24	18	10	8	33	18	15,0	4,0	6,0	3,6		8,5	0,05	0,50	82 000	860	720	158	20,4	14,8	36	373	153	1,00	5	93	
15	30-04	1974	1,46	21	50	69	49	43	29	22	18	10	8	36	20	14,5	3,5	5,5	2,6		8,7	0,05	0,60	80 000	520	300	163	20,8	15,3	43	381	163	0,50	5	95	
16	01-05	2010	1,45	34	52	70	49	39	29	22	17	10	8	35	21	14,0	4,0	6,0	3,0		8,6	0,00	0,40	83 000	640	390	163	20,8	15,1	36	356	172	0,80	5	93	
17	02-05	2051	1,46	33	56	79	57	48	36	26	20	11	9	40	22	17,5	4,5	8,5	2,8		8,4	0,00	0,50	82 000	680	400	160	21,8	16,1	40	402	169	1,00	5	84	
18	03-05	2125	1,47	33	54	75	54	43	32	23	17	10	8	38	21	16,5	4,0	7,5	2,8		8,3	0,00	0,60	85 000	600	440	160	21,6	15,7	55	377	178	0,50	5	84	
19	04-05	2463	1,47	37	54	70	51	43	33	26	22	10	8	35	19	16,0	4,0	7,0	2,5		8,3	0,00	0,60	85 000	600	400	160	21,6	16,0	53	394	171	0,50	5	94	
20	05-05	2750	1,47	36	60	84	60	50	37	31	23	13	10	42	24	18,0	6,0	12,0	2,8		7,9	0,00	0,60	91 000	720	600	160	22,0	15,8	57	381	187	0,50	5	94	
21	06-05	2913	1,47	32	63	93	65	54	40	33	24	13	11	47	26	19,5	6,0	13,0	2,7		8,0	0,00	0,60	92 000	680	520	170	22,0	15,7	60	362	184	0,50	5	99	
22	07-05	3040	1,47	41	60	86	62	52	37	31	24	13	11	44	26	18,0	5,5	11,5	2,8		8,0	0,00	0,60	90 000	600	700	160	22,0	16,9	63	361	189	0,50	5	84	
23	08-05	3233	1,47	41	60	82	58	48	35	29	22	11	9	41	24	17,0	5,0	10,0	2,6		7,9	0,00	0,70	85 000	760	640	160	22,0	16,2	58	385	184	0,50	5	79	
24	09-05	3301	1,47	43	62	90	64	53	38	32	25	13	11	45	26	19,0	6,0	12,0	2,6		7,8	0,00	0,70	86 000	720	520	160	22,0	15,6	60	380	171	0,50	5	84	
25	10-05	3301	1,47	47	58	90	60	54	39	34	25	11	8	43	30	18,0	5,0	9,0	2,6		7,9	0,00	0,70	87 000	720	520	160	21,5	15,5	58	380	169	0,50	5	84	

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1 Introduction

A total of 60 cutting samples, 23 core chips, and 2 gases were analysed according to the following analytical program (see also Table 1 in Appendix 1):

Analyses	Number of Samples				
	cutt/core	mud	cond.	gas	total
TOC	20				20
THA pyrolysis	45				45
Vitrinite Reflectance	34				34
Thermal extraction and pyrolysis GC	25+10				35
Solvent extraction/asph. precipitation	10				10
Iatroscan separation	10				10
MPLC separation	10				10
GC saturates	10				10
GC aromatics	10				10
GC-MS saturates/whole extract	10				10
GC-MS aromatics	10				10
$\delta^{13}\text{C}$ of whole oil/fractions	50				50
$\delta^{13}\text{C}$ of gas and gas composition				2	2

The analytical work was performed in accordance with the guidelines given in "The Norwegian Industry Guide to Organic Geochemical Analyses (1993)". The analyses were carried out at Geolab Nor with subcontracts to IFE (vitrinite reflectance, chemical and isotopic composition of gases). Abbreviated lithological descriptions of samples analysed by Geolab Nor are presented in Table 3 (in Appendix 1).

GEOCHEMICAL DATA REPORT

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nor, A=telemax, C=no

CLIENT:

STATOIL

REF(S)

Linda Stalker

ORDER NO: G96-13

CONTRACT NO: DTJ 020215

TITLE

NOCS 35/10-2 (2T2) WELL STUDY

AUTHOR(S)

Peter Barry Hall

GEOLAB PROJECT NO.

62276

DATE

17.02.97

PROJECT MANAGER

Peter Barry Hall, Snr. Scientist
Ian Ferriday, Snr. Scientist

QA RESPONSIBLE

Kjell Arne Bakken, Snr. Scientist

REPORT NO./FILE

PAGE

1 of 1

Table 1. ANALYTICAL PROGRAM

Sample Depth and Type c = Cuttings s = SWC p = Conv core/ plug m = Mud o = oil/gas R = Reservoir S = Source	Fractions	Lithology Description	HS & Occ Gas	Leco TOC	RockEval	Therm Ext GC	Pyrolysis GC	Extraction	MPLC & Deasp	Infrared	EOM GC	Sat GC	Aro GC	Sat GCMS	Aro GCMS	Bulk C Isot	Vis Kerogen and isotopes	Nit Reflect
1470.00cS	IFE																	x
1570.00cS	IFE																	x
1670.00cS	IFE																	x
1770.00cS	IFE																	x
1869.00cS	IFE																	x
1947.00cR	026-1L	x			x	x												
1950.00cR	023-1L	x			x	x												
1953.00cR	024-1L	x			x	x		x	x	x		x	x	x	x	x		
1955.00sR	003-1L					x		x	x	x		x	x	x	x	x		
1956.00cR	025-1L	x			x													
1956.70sR	002-1L					x												
1957.50sR	001-1L					x												
1960.42pR	0041L				x													
1961.23pR	0051L				x													
1980.00cS	IFE																	x
2070.00cS	IFE																	x
2170.00cS	IFE																	x
2270.00cS	IFE																	x
2370.00cS	IFE																	x
2470.00cS	IFE																	x
2570.00cS	IFE																	x
2670.00cS	IFE																	x
2770.00cS	IFE																	x
2870.00cS	IFE																	x
2970.00cS	IFE																	x
3070.00cS	IFE																	x
3170.00cS	IFE																	x
3270.00cS	IFE																	x
3280.00cS	IFE																	x
3380.00cS	IFE																	x
3460.00cS	IFE																	x
3560.00cS	IFE																	x
3650.00cS	IFE																	x
3770.00cS	IFE																	x
3870.00cS	IFE																	x
3927.00sS	0061L			x	x	x	x											
3942.00cS	0027-1L	x		x	x	x	x	x	x		x	x	x	x	x	x	x	
3948.00sS	0071L			x	x													
3969.00cS	IFE																	x
3989.00sS	0081L			x	x													

Table 1. ANALYTICAL PROGRAM - GASES

Sample Depth and Type	Fractions	API Gravity	Gas Composition and Isotopes		Leco TOC	RockEval	Thermal Extraction GC	Pyrolysis GC	Extraction	MPLC & Deasphaltene	Infrared	EOM GC	Sat GC Quantitative	Aro GC	Sat GCMS Quantitative	Aro GCMS	Bulk Carbon Isotope	Visual Kerogen	Vitrinite Reflectance
			HeadSpace & Occluded Gas	GCMS															
4217.90 fnt			X																
4199.30 fnt			X																

Table 3: Lithology description for well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
1956.00						0025
				100 Sh/Clst: m gy to m drk gy, slt, s		0025-1L
1956.70	swc					0002
				100 Sh/Clst: drk gy		0002-1L
1957.50	swc					0001
				100 Sh/Clst: drk gy		0001-1L
1960.42	ccp					0004
				100 S/Sst : drk gn gy		0004-1L
1961.23	ccp					0005
				100 S/Sst : drk gn gy, cly		0005-1L
1980.00						0055
				100 Sh/Clst		0055-1L
2070.00						0056
				100 Sh/Clst		0056-1L
2170.00						0057
				100 Sh/Clst		0057-1L
2270.00						0058
				100 Sh/Clst		0058-1L

Table 3: Lithology description for well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
3270.00						0068
			100	Sh/Clst		0068-1L
3280.00						0069
			100	Sh/Clst		0069-1L
3380.00						0070
			100	Sh/Clst		0070-1L
3460.00						0071
			100	Sltst		0071-1L
3560.00						0072
			100	Sltst		0072-1L
3650.00						0073
			100	Sh/Clst		0073-1L
3770.00						0074
			100	Sh/Clst		0074-1L
3870.00						0075
			100	Sh/Clst		0075-1L
3927.00	swc					0006
	5.02		100	Sh/Clst: blk to brn blk, cly, dd		0006-1L

Table 3: Lithology description for well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
4071.00						0077
			100	Sh/Clst		0077-1L
4094.00	swc					0010
		4.05	100	Sh/Clst: blk to brn blk, dd		0010-1L
4104.00						0031
		3.08	35	S/Sst : lt. brn gy, carb, slt, cly, f		0031-1L
			35	Sh/Clst: brn blk, mic		0031-2L
			30	Cont : prp, dd, tar-ad		0031-3L
4128.00						0032
		1.90	85	Sh/Clst: dsk y brn to brn blk, calc, carb, slt, s, mic		0032-1L
			10	Cont : prp, dd		0032-2L
			5	Ca : brn gy, cly		0032-3L
4131.00						0033
		1.98	85	Sh/Clst: dsk y brn to brn blk, calc, carb, slt		0033-1L
			10	Cont : prp		0033-3L
			5	Ca : w		0033-2L
4156.45	ccp					0011
			100	S/Sst : brn blk, cly, dd		0011-1L
4159.99	ccp					0012
		69.15	100	Coal : blk, dd		0012-1L
4166.65	ccp					0013
			100	S/Sst : brn gy, cly, dd		0013-1L

Table 3: Lithology description for well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
4248.00						0034
				80 S/Sst : pl brn, mic		0034-1L
				10 Sh/Clst: dsk y brn to brn blk, carb, wx		0034-2L
				10 Coal : blk		0034-3L
				tr Cont : dd		0034-4L
4254.00						0079
				100 Coal		0079-1L
4272.00						0035
				100 S/Sst : w to pl brn, calc, slt, mic		0035-1L
				tr Sh/Clst: dsk y brn to brn blk, carb		0035-2L
				tr Cont : prp, dd		0035-3L
4284.00						0036
				95 Cont : Mica-ad, ns		0036-2L
				5 S/Sst : w to pl brn, f		0036-1L
4308.00						0037
				60 S/Sst : w to pl brn, f		0037-1L
				20 Cont : Mica-ad, ns		0037-4L
				10 Sh/Clst: dsk y brn to brn blk		0037-2L
				10 Coal : blk		0037-3L
4317.00	swc					0022
		1.51		100 Sh/Clst: brn blk, dd		0022-1L
4338.00						0038
				75 S/Sst : w to brn gy, slt, crs		0038-1L
				10 Sh/Clst: dsk y brn to brn blk		0038-2L
				10 Cont : prp, ns		0038-4L
				5 Coal : blk		0038-3L

Table 3: Lithology description for well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Type	Grp	Frm	Age	Trb	Sample
Int	Cvd	TOC%	%	Lithology description		
4461.00						0045
				75 S/Sst : w, f		0045-1L
				20 Cont : Mica-ad, ns		0045-3L
				5 Sh/Clst: m gy to drk gy, brn blk, slt		0045-2L
4464.00						0046
				70 S/Sst : w, f		0046-1L
				25 Cont : Mica-ad		0046-3L
				5 Sh/Clst: m gy to m drk gy, brn blk, slt		0046-2L
4470.00						0081
				100 Sh/Clst		0081-1L
4491.00						0047
				70 S/Sst : w to pl brn gy, f		0047-1L
				25 Cont : Mica-ad		0047-3L
				5 Sh/Clst: m gy to m drk gy, slt		0047-2L
4569.00						0082
				100 Sh/Clst		0082-1L
4611.00						0048
				85 S/Sst : w to pl brn gy, f, crs		0048-1L
				10 Sh/Clst: m gy to m drk gy, dsk y brn to brn blk, slt		0048-2L
				5 Cont : Mica-ad, prp		0048-3L
4641.00						0049
				90 S/Sst : w to pl brn gy, calc, f, crs		0049-1L
				5 Sh/Clst: m gy to m drk gy, dsk y brn to brn blk, slt		0049-2L
				5 Cont : Mica-ad, prp		0049-3L

Table 4 : Thermal Maturity Data for well NOCS 35/10-2(2T2)

Page: 1

Depth unit of measure: m

Depth	Typ	Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation (%)	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
1470.00	cut	Sh/Clst	0.25	17	0.04	-	-	-	0050-1L
1570.00	cut	Sh/Clst	0.30	20	0.05	-	-	-	0051-1L
1670.00	cut	Sh/Clst	0.31	18	0.05	-	-	-	0052-1L
1770.00	cut	Sh/Clst	0.33	7	0.06	-	-	-	0053-1L
1869.00	cut	Sh/Clst	0.38	9	0.05	-	-	-	0054-1L
1980.00	cut	Sh/Clst	0.32	20	0.10	-	-	-	0055-1L
2070.00	cut	Sh/Clst	0.34	9	0.05	-	-	-	0056-1L
2170.00	cut	Sh/Clst	0.48	17	0.09	-	-	-	0057-1L
2270.00	cut	Sh/Clst	0.48	14	0.04	-	-	-	0058-1L
2370.00	cut	Sltst	0.47	4	0.07	-	-	-	0059-1L
2470.00	cut	Sh/Clst	0.49	13	0.04	-	-	-	0060-1L
2570.00	cut	Sh/Clst	0.54	13	0.04	-	-	-	0061-1L
2670.00	cut	Sh/Clst	0.57	19	0.07	-	-	-	0062-1L
2770.00	cut	Sh/Clst	0.54	20	0.08	-	-	-	0063-1L
2870.00	cut	Sh/Clst	0.58	21	0.10	-	-	-	0064-1L

Table 4 : Thermal Maturity Data for well NOCS 35/10-2 (2T2)

Depth unit of measure: m

Depth	Typ Lithology	Vitrinite Reflectance (%)	Number of Readings	Standard Deviation (%)	Spore Fluorescence Colour	SCI	Tmax (°C)	Sample
4199.50	ccp Sh/Clst	1.13	23	0.07	-	-	-	0078-1L
4254.00	cut Coal	1.20	20	0.08	-	-	-	0079-1L
4317.00	swc Sh/Clst: brn blk	-	-	-	-	9.0	470	0022-1L
4365.00	cut Sh/Clst: dsk y brn to brn blk	-	-	-	-	9.0	468	0040-2L
4371.00	cut Sh/Clst	1.13	17	0.08	-	-	-	0080-1L
4470.00	cut Sh/Clst	1.22	21	0.13	-	-	-	0081-1L
4569.00	cut Sh/Clst	1.36	20	0.24	-	-	-	0082-1L
4668.00	cut Sh/Clst	1.40	16	0.21	-	-	-	0083-1L

Table 5A: Rock-Eval table for well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Typ	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
4094.00	swc	Sh/Clst: blk to brn blk	2.15	2.44	0.51	4.78	4.05	60	13	4.6	0.47	462	0010-1L
4104.00	cut	Sh/Clst: brn blk	1.50	1.66	0.95	1.75	3.08	54	31	3.2	0.47	460	0031-2L
4128.00	cut	Sh/Clst: dsk y brn to brn blk	1.64	1.54	1.34	1.15	1.90	81	71	3.2	0.52	454	0032-1L
4131.00	cut	Sh/Clst: dsk y brn to brn blk	0.98	1.16	1.08	1.07	1.98	59	55	2.1	0.46	455	0033-1L
4156.45	ccp	S/Sst : brn blk	0.49	0.42	0.32	1.31	-	-	-	0.9	0.54	480	0011-1L
4159.99	ccp	Coal : blk	7.75	97.55	5.71	17.08	69.15	141	8	105.3	0.07	480	0012-1L
4166.65	ccp	S/Sst : brn gy	0.65	0.42	0.48	0.88	-	-	-	1.1	0.61	450	0013-1L
4183.90	ccp	Coal : blk	4.89	16.93	2.65	6.39	15.30	111	17	21.8	0.22	473	0014-1L
4193.33	ccp	Coal : blk	1.76	4.82	2.35	2.05	5.93	81	40	6.6	0.27	479	0015-1L
4198.15	ccp	S/Sst : brn gy to brn blk	0.77	1.88	0.63	2.98	-	-	-	2.7	0.29	363	0016-1L
4204.25	ccp	S/Sst : brn gy	0.16	0.13	0.18	0.72	-	-	-	0.3	0.55	492	0017-1L
4214.60	ccp	Sh/Clst: blk	2.10	26.76	0.21	127.43	20.80	129	1	28.9	0.07	476	0018-1L
4215.95	ccp	S/Sst : brn gy to brn blk	0.07	0.20	0.15	1.33	-	-	-	0.3	0.26	473	0019-1L
4220.75	ccp	S/Sst : brn gy to brn blk	0.09	0.13	0.26	0.50	-	-	-	0.2	0.41	461	0020-1L
4235.30	ccp	S/Sst : brn gy	0.08	0.06	0.08	0.75	-	-	-	0.1	0.57	434	0021-1L
4248.00	cut	S/Sst : pl brn	0.11	0.27	0.59	0.46	-	-	-	0.4	0.29	477	0034-1L

Table 5B: Rock-Eval table for well RE,STD

Depth unit of measure: m

Depth	Typ	Form	Lithology	S1	S2	S3	S2/S3	TOC	HI	OI	PP	PI	Tmax	Sample
1.00	std		bulk	0.45	19.85	2.18	9.11	-	-	-	20.3	0.02	421	0090-0B
2.00	std		bulk	0.51	19.93	1.92	10.38	-	-	-	20.4	0.02	420	0091-0B
3.00	std		bulk	0.48	20.02	2.02	9.91	-	-	-	20.5	0.02	420	0092-0B

Table 7: Visual Kerogen Composition Data for well NOCS 35/10-2 (2T2)

Depth unit of measure: m

Depth	Typ	Lithology	Amorphous			Algal/Phytoplankton					Herbaceous				Woody				Coaly			SCI	Sample	
			AM%	FA	HA	AP%	Cy	Ta	Bo	Di	De	HE%	SP	Cu	De	WO%	FL	NF	De	CO%	FS			De
3942.00	cut	Sh/Clst	75	*		5	*			*	TR	*				10	*	**		10	*	**	8.5(??)/NDP	0027-1L
4094.00	swc	Sh/Clst	65			10	**			*	TR	*				10	*	**		15	*	**	8.5-9.0(??)/NDP	0010-1L
4317.00	swc	Sh/Clst	TR			0					30	**	*	*	20	**	*		50	**	*	9.0	0022-1L	
4365.00	cut	Sh/Clst	TR			TR	*				50	**	?	**	20	**	*		30	*		9.0	0040-2L	

Table 8 b: MPLC Bulk Composition: Concentration of EOM and Fraction (wt ppm rock) for well NOCS 35/10-2 (2T2)

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Sat	Aro	Asph	NSO	HC	Non-HC	Sample
1953.00	cut	Sh/Clst: m gy to m drk gy	2450	471	223	166	1589	694	1756	0024-1L
1955.00	swc	Sh/Clst: drk gy	23793	5186	906	24	17675	6093	17699	0003-1L
3942.00	cut	Sh/Clst: brn blk	3831	2256	950	125	498	3207	623	0027-1L
4094.00	swc	Sh/Clst: blk to brn blk	2807	1633	770	267	136	2403	403	0010-1L
4166.65	ccp	S/Sst : brn gy	1000	749	170	30	51	919	81	0013-1L
4198.15	ccp	S/Sst : brn gy to brn blk	15503	716	255	383	14148	972	14531	0016-1L
4220.75	ccp	S/Sst : brn gy to brn blk	505	158	73	81	191	232	272	0020-1L
4248.00	cut	S/Sst : pl brn	443	12	8	198	223	21	421	0034-1L
4317.00	swc	Sh/Clst: brn blk	928	270	189	362	105	459	468	0022-1L
4365.00	cut	Sh/Clst: dsk y brn to brn blk	1944	1111	539	227	66	1651	293	0040-2L

Table 8 d: MPLC Bulk Composition: Material extracted from the rock (%) for well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Typ	Lithology	Sat	Aro	Asph	NSO	HC	Non-HC	Sat	HC	Sample
			EOM	EOM	EOM	EOM	EOM	EOM	Aro	Non-HC	
1953.00	cut	Sh/Clst: m gy to m drk gy	19.24	9.11	6.79	64.87	28.35	71.65	211.27	39.56	0024-1L
1955.00	swc	Sh/Clst: drk gy	21.80	3.81	0.10	74.29	25.61	74.39	572.04	34.43	0003-1L
3942.00	cut	Sh/Clst: brn blk	58.90	24.82	3.27	13.01	83.72	16.28	237.34	514.15	0027-1L
4094.00	swc	Sh/Clst: blk to brn blk	58.19	27.43	9.52	4.86	85.62	14.38	212.15	595.36	0010-1L
4166.65	ccp	S/Sst : brn gy	74.88	16.99	3.01	5.12	91.87	8.13	440.67	1130.00	0013-1L
4198.15	ccp	S/Sst : brn gy to brn blk	4.62	1.65	2.47	91.26	6.27	93.73	280.29	6.69	0016-1L
4220.75	ccp	S/Sst : brn gy to brn blk	31.38	14.62	16.15	37.85	46.00	54.00	214.74	85.19	0020-1L
4248.00	cut	S/Sst : pl brn	2.86	1.90	44.76	50.48	4.76	95.24	150.00	5.00	0034-1L
4317.00	swc	Sh/Clst: brn blk	29.09	20.45	39.09	11.36	49.55	50.45	142.22	98.20	0022-1L
4365.00	cut	Sh/Clst: dsk y brn to brn blk	57.17	27.74	11.70	3.40	84.91	15.09	206.12	562.50	0040-2L

Table 8f: Iatroscan TLC Bulk Composition: Rel. percentages of sep. fractions for well NOCS 35/10-2(2T2)

Depth unit of measure: m

<u>Depth</u>	<u>Typ</u>	<u>Lithology</u>	<u>Sat HC</u>	<u>Aro HC</u>	<u>Resins</u>	<u>Asp</u>	<u>Tot HC</u>	<u>Tot Pol</u>	<u>Sample</u>
1953.00	cut	Sh/Clst	20.77	22.71	49.72	6.79	43.49	56.51	0024-1L
1955.00	swc	Sh/Clst	43.19	5.54	51.16	0.10	48.74	51.26	0003-1L
3942.00	cut	Sh/Clst	59.81	21.85	15.08	3.26	81.66	18.34	0027-1L
4094.00	swc	Sh/Clst	60.51	19.22	10.75	9.52	79.73	20.27	0010-1L
4166.65	ccp	S/Sst	81.58	10.57	4.82	3.03	92.15	7.85	0013-1L
4198.15	ccp	S/Sst	4.85	-	92.68	2.47	4.85	95.15	0016-1L
4220.75	ccp	S/Sst	30.98	3.51	49.38	16.13	34.49	65.51	0020-1L
4248.00	cut	S/Sst	22.09	12.55	20.35	45.00	34.65	65.35	0034-1L
4317.00	swc	Sh/Clst	30.85	12.99	17.28	38.89	43.83	56.17	0022-1L
4365.00	cut	Sh/Clst	54.81	15.84	17.65	11.70	70.65	29.35	0040-2L

Table 9Ba: Aromatic Hydrocarbon Ratios (peak area) for well NOCS 35/10-2(2T2)

Page: 1

Depth unit of measure: m

Depth	Typ	Lithology	MNR	DMNR	BPhR	2/1MP	MPI1	MPI2	Rc	DBT/P	4/1MDBT (3+2) /1MDBT	Sample
1953.00	cut	Sh/Clst: m gy to m drk gy	-	-	-	2.46	0.98	0.98	0.99	-	-	0024-1L
1955.00	swc	Sh/Clst: drk gy	-	-	-	-	-	-	-	-	-	0003-1L
3942.00	cut	Sh/Clst: brn blk	1.19	2.56	0.20	1.15	0.86	0.99	0.92	-	-	0027-1L
4094.00	swc	Sh/Clst: blk to brn blk	-	2.35	0.16	1.07	0.94	1.14	0.96	-	-	0010-1L
4166.65	ccp	S/Sst : brn gy	-	3.69	-	2.50	1.33	1.58	1.20	-	-	0013-1L
4198.15	ccp	S/Sst : brn gy to brn blk	-	6.10	0.43	2.54	1.17	1.32	1.10	0.41	-	0016-1L
4220.75	ccp	S/Sst : brn gy to brn blk	-	-	-	2.54	1.35	1.53	1.21	-	-	0020-1L
4248.00	cut	S/Sst : pl brn	-	-	-	3.48	1.84	2.32	1.50	-	-	0034-1L
4317.00	swc	Sh/Clst: brn blk	-	-	-	2.50	1.51	1.78	1.31	-	-	0022-1L
4365.00	cut	Sh/Clst: dsk y brn to brn blk	-	2.98	0.21	1.47	1.08	1.31	1.05	-	-	0040-2L

Table 10A: Tabulation of carbon isotope data for EOM/EOM - fractions for well NOCS 35/10-2 (2T2)

Depth unit of measure: m

Depth	Typ	Lithology	EOM	Saturated	Aromatic	NSO	Asphaltenes	Kerogen	Sample
1953.00	cut	Sh/Clst	-29.06	-28.35	-27.77	-28.75	-27.02	-	0024-1
1955.00	swc	Sh/Clst	-28.63	-29.08	-28.24	-27.71	-26.02	-	0003-1
3942.00	cut	Sh/Clst	-27.97	-28.39	-27.02	-27.47	-27.15	-27.25	0027-1
4094.00	swc	Sh/Clst	-27.12	-27.56	-25.91	-24.47	-25.67	-26.28	0010-1
4166.65	ccp	S/Sst	-27.58	-27.66	-27.11	-	-24.41	-	0013-1
4198.15	ccp	S/Sst	-26.00	-26.84	-26.49	-25.38	-28.51	-	0016-1
4220.75	ccp	S/Sst	-	-27.81	-27.11	-25.71	-22.68	-	0020-1
4248.00	cut	S/Sst	-	-26.03	-23.33	-24.99	-24.26	-	0034-1
4317.00	swc	Sh/Clst	-	-24.91	-21.75	-21.99	-22.66	-	0022-1
4365.00	cut	Sh/Clst	-25.15	-26.10	-26.18	-24.52	-23.78	-23.85	0040-2

Table 11a: Variation in Triterpane Distribution (peak height) SIR for Well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Lithology	Ratio1	Ratio2	Ratio3	Ratio4	Ratio5	Ratio6	Ratio7	Ratio8	Ratio9	Rat.10	Rat.11	Rat.12	Rat.13	Rat.14	Sample
1953.00	Sh/Clst	3.39	0.77	0.20	0.69	0.41	0.05	2.07	3.01	0.67	0.04	0.93	0.53	0.34	37.02	0024-1
1955.00	Sh/Clst	0.65	0.39	0.23	0.62	0.38	0.21	0.13	0.21	0.12	0.22	0.89	0.39	0.14	61.79	0003-1
3942.00	Sh/Clst	-	-	-	0.87	0.46	3.52	-	-	-	1.22	1.00	0.46	-	-	0027-1
4094.00	Sh/Clst	0.57	0.36	0.19	0.87	0.47	0.28	-	-	-	0.64	0.82	0.42	0.12	-	0010-1
4166.65	S/Sst	0.64	0.39	0.23	0.95	0.49	0.22	-	-	-	0.45	0.89	0.46	0.07	58.14	0013-1
4198.15	S/Sst	0.61	0.38	0.32	1.46	0.59	0.07	-	-	-	0.54	0.90	0.59	0.11	59.24	0016-1
4220.75	S/Sst	0.84	0.46	0.22	0.88	0.47	0.04	0.64	0.72	0.39	0.24	0.91	0.49	0.15	58.21	0020-1
4248.00	S/Sst	1.18	0.54	0.21	0.79	0.44	0.06	0.10	0.13	0.09	0.27	0.89	0.44	0.13	59.34	0034-1
4317.00	Sh/Clst	0.97	0.49	0.20	0.79	0.44	0.06	0.18	0.23	0.16	0.24	0.88	0.44	0.14	61.56	0022-1
4365.00	Sh/Clst	0.70	0.41	0.27	0.89	0.47	0.51	-	-	-	0.45	0.87	0.44	0.08	56.41	0040-2

Table 11b: Variation in Sterane Distribution (peak height) SIR for Well NOCS 35/10-2(2T2)

Depth unit of measure: m

<u>Depth</u>	<u>Lithology</u>	<u>Ratio1</u>	<u>Ratio2</u>	<u>Ratio3</u>	<u>Ratio4</u>	<u>Ratio5</u>	<u>Ratio6</u>	<u>Ratio7</u>	<u>Ratio8</u>	<u>Ratio9</u>	<u>Ratio10</u>	<u>Sample</u>
1953.00	Sh/Clst	0.12	5.59	43.40	0.67	0.87	0.06	0.05	0.28	0.06	0.41	0024-1
1955.00	Sh/Clst	0.87	43.31	75.96	1.74	0.78	0.52	0.36	0.61	0.76	2.79	0003-1
3942.00	Sh/Clst	0.95	60.81	68.62	2.08	0.64	0.67	0.53	0.52	1.55	2.79	0027-1
4094.00	Sh/Clst	0.79	53.37	73.21	1.68	0.72	0.48	0.34	0.58	1.14	2.93	0010-1
4166.65	S/Sst	0.82	43.93	76.39	1.72	0.79	0.49	0.33	0.62	0.78	2.89	0013-1
4198.15	S/Sst	0.75	45.07	78.01	1.57	0.80	0.50	0.35	0.64	0.82	3.23	0016-1
4220.75	S/Sst	0.61	19.98	60.33	1.61	0.79	0.31	0.21	0.43	0.25	0.95	0020-1
4248.00	S/Sst	0.60	41.11	71.00	1.11	0.75	0.32	0.21	0.55	0.70	2.08	0034-1
4317.00	Sh/Clst	0.73	37.47	72.90	1.61	0.78	0.41	0.29	0.57	0.60	2.15	0022-1
4365.00	Sh/Clst	0.86	57.08	76.74	1.29	0.74	0.50	0.37	0.62	1.33	3.84	0040-2

Table 11c: Raw triterpane data (peak height) m/z 191 SIR for Well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Lithology	23/3	24/3	25/3	24/4	26/3	27Ts	27Tm	28a β	25nor30a β	Sample
		29a β	29Ts	30d	29 β a	300	30a β	30 β a	30G	31a β S	
		31a β R	32a β S	32a β R	33a β S	33a β R	34a β S	34a β R	35a β S	35a β R	
1953.00	Sh/Clst	1523.7 24239.6 11573.9	1268.5 16018.0 2730.2	0.0 1694.0 4644.0	2185.9 17810.3 1525.7	0.0 0.0 3517.3	2880.3 35261.0 654.0	9778.0 2659.8 1325.3	73062.7 0.0 822.2	22190.5 5047.9 1882.4	0024-1
1955.00	Sh/Clst	2194.3 3195.2 1316.1	1150.7 1595.8 1033.8	671.5 1100.4 639.3	1206.2 571.0 572.7	556.5 0.0 365.6	2593.2 5139.2 294.4	1684.7 633.0 187.3	678.5 0.0 230.1	300.1 1699.3 147.7	0003-1
3942.00	Sh/Clst	441.6 209.7 0.0	295.1 114.9 0.0	0.0 848.2 0.0	152.4 0.0 0.0	167.2 0.0 0.0	904.5 241.2 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0027-1
4094.00	Sh/Clst	266.2 243.9 91.0	178.5 0.0 0.0	82.9 77.7 51.4	124.3 0.0 42.4	40.0 0.0 0.0	142.4 280.3 0.0	80.9 60.5 0.0	0.0 0.0 0.0	0.0 109.9 0.0	0010-1
4166.65	S/Sst	433.6 488.5 152.7	230.6 140.3 101.7	110.6 110.7 73.2	233.2 0.0 72.9	93.5 0.0 0.0	270.3 511.8 0.0	172.3 66.0 0.0	0.0 0.0 0.0	106.2 203.8 0.0	0013-1

Table 11d: Raw sterane data (peak height) m/z 217 SIR for Well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Lithology	21a	22a	27dBS	27dBR	27daR	27daS	28dBS	28dBR	28daR*	Sample
		29dBS*	28daS*	27aaR	29dBR	29daR	28aaS	29daS*	28BS		
		28aaR	29aaS	29BR	29BS	29aaR					
1953.00	Sh/Clst	3253.3	748.2	4256.6	4084.8	2137.2	4300.1	2550.0	1977.9	13644.3	0024-1
		3840.0	2577.1	32043.8	3439.2	4178.0	2326.8	10454.4	1590.2		
		31771.6	2604.4	5158.9	12698.4	43964.1					
1955.00	Sh/Clst	2185.2	648.0	5358.4	2989.1	1473.7	1428.0	2510.1	1417.5	1002.9	0003-1
		2851.8	1172.8	811.2	2053.0	675.3	406.5	870.9	687.8		
		391.7	447.2	848.9	782.7	585.3					
3942.00	Sh/Clst	771.6	459.7	2279.1	1366.9	705.0	679.2	1048.1	661.7	372.0	0027-1
		1098.6	275.6	108.7	785.2	322.9	0.0	210.3	144.2		
		0.0	174.1	147.8	165.3	112.2					
4094.00	Sh/Clst	157.2	72.6	205.3	139.4	84.3	86.8	92.4	63.8	78.5	0010-1
		130.8	80.9	55.4	117.2	0.0	52.6	59.7	83.2		
		0.0	55.9	79.4	63.6	48.8					
4166.65	S/Sst	299.4	93.1	639.7	409.5	197.4	206.8	308.6	185.1	178.8	0013-1
		357.1	185.0	138.0	242.6	100.9	71.9	144.2	134.0		
		68.6	68.5	145.0	107.4	87.5					

* 28daR coel with 27aaS, 29dBS coel with 27BR, 28daS coel with 27BS, 29daS coel with 28BR

Table 11e: Raw sterane data (peak height) m/z 218 SIR for Well NOCS 35/10-2 (2T2)

Depth unit of measure: m

Depth	Lithology	27 β BR	27 β BS	28 β BR	28 β BS	29 β BR	29 β BS	30 β BR	30 β BS	Sample
1953.00	Sh/Clst	2066.1	1183.3	5135.8	1940.9	1805.4	5824.1	0.0	0.0	0024-1
1955.00	Sh/Clst	1519.9	1138.1	898.3	875.8	925.2	918.8	240.9	231.9	0003-1
3942.00	Sh/Clst	368.3	203.6	163.4	142.6	175.6	138.1	0.0	0.0	0027-1
4094.00	Sh/Clst	92.3	73.9	70.6	66.0	62.8	67.1	0.0	0.0	0010-1
4166.65	S/Sst	259.7	207.6	138.2	129.1	116.3	129.5	0.0	0.0	0013-1
4198.15	S/Sst	415.6	323.9	182.4	201.3	239.4	210.2	0.0	0.0	0016-1
4220.75	S/Sst	1638.0	1338.2	966.7	967.1	1078.3	1057.3	168.6	227.3	0020-1
4248.00	S/Sst	1372.5	1211.0	906.8	1076.0	985.7	1046.0	205.1	224.9	0034-1
4317.00	Sh/Clst	245.0	223.7	143.4	184.2	220.2	210.9	0.0	0.0	0022-1
4365.00	Sh/Clst	201.8	200.8	125.9	136.8	155.4	143.8	0.0	0.0	0040-2

Table 11g. GCMS-Saturated Hydrocarbon Data, Well 35/10-2T2															
			20S	bb	22S	Ts/Tm	Ttx	30D	30AB-HOP	%C27	%C28	%C29	C30	Dia/reg	28ab/H
sample		bottom depth													
0027-1	SR	3942	0.61	0.52				3.52	1.00	48	26	26	-	7.58	0.00
0010-1	SR	4094	0.53	0.58		1.76		0.28	0.82	38	32	30	-	2.57	0.00
0022-1	SR	4317	0.37	0.57	0.62	1.03	0.56	0.06	0.88	38	27	35	-	2.25	0.18
0040-2	SR	4365	0.57	0.62	0.56	1.42		0.51	0.87	42	27	31	-	3.42	0.00
0024-1	Res.	1953	0.06	0.28	0.37	0.29	0.10	0.05	0.93	18	39	42	-	0.18	2.07
0003-1	Res.	1955	0.43	0.61	0.62	1.54	1.93	0.21	0.89	42	28	29	0.08	4.60	0.13
0013-1	Res.	4166.65	0.44	0.62	0.58	1.57		0.22	0.89	48	27	25	-	3.31	0.00
0016-1	Res.	4198.15	0.45	0.64	0.59	1.63	0.43	0.07	0.90	47	24	29	-	2.44	0.00
0020-1	Res.	4220.75	0.20	0.43	0.58	1.19	0.22	0.04	0.91	42	27	30	0.06	1.72	0.64
0034-1	Res.	4248	0.41	0.55	0.59	0.84	0.52	0.06	0.89	39	30	31	0.07	1.26	0.10

Table 11g. GCMS-Saturated Hydrocarbo												
			H/S	ppmH	ppmS	3R/H	4R/H	35/34H	29/30H	Dem/H	O/H	G/H
sample		bottom depth										
=====												
0027-1	SR	3942	1.14	-	-	1.83	0.63	-	0.87	0.00	0.00	-
0010-1	SR	4094	2.55	-	-	0.95	0.44	-	0.87	0.00	0.00	-
0022-1	SR	4317	3.86	-	-	0.56	0.19	0.75	0.79	0.13	0.00	0.01
0040-2	SR	4365	3.18	-	-	0.91	0.29	-	0.89	0.25	0.00	-
0024-1	Res.	1953	7.26	-	-	0.04	0.06	1.37	0.69	0.63	0.00	0.08
0003-1	Res.	1955	3.3	-	-	0.43	0.23	0.78	0.62	0.06	0.00	0.05
0013-1	Res.	4166.65	2.16	-	-	0.85	0.46	-	0.95	0.21	0.00	0.01
0016-1	Res.	4198.15	3.99	-	-	1.62	1.04	-	1.46	0.00	0.00	-
0020-1	Res.	4220.75	3.27	-	-	0.47	0.35	0.80	0.88	0.22	0.00	0.03
0034-1	Res.	4248	3.89	-	-	0.57	0.19	0.84	0.79	0.32	0.00	0.01

Biomarker codes used in derivation of ratios

<u>Compound name</u>	<u>Old code</u>	<u>NEW CODE</u>
Triterpanes		
C ₂₃ H ₄₂ tricyclic terpane	P	23/3
C ₂₄ H ₄₄ tricyclic terpane	Q	24/3
C ₂₅ H ₄₆ tricyclic terpane ¹	R	25/3
C ₂₄ H ₄₂ tetracyclic terpane	S	24/4
C ₂₆ H ₄₈ tricyclic terpane ²	T	26/3
18 α (H)-22,29,30-trisnorneohopane	27A	27Ts
17 α (H)-22,29,30-trisnorhopane	27B	27Tm
17 α (H), 21 β (H)-25,28,30-trisnorhopane		25nor28 $\alpha\beta$
17 α (H), 21 β (H)-28,30-bisnorhopane	28A	28 $\alpha\beta$
17 α (H), 21 β (H)-25-norhopane		25nor30 $\alpha\beta$ ³
17 α (H), 21 β (H)-30-norhopane	C29A	29 $\alpha\beta$
18 α (H)-30-norneohopane		29Ts
15 α -methyl-17 α (H)-27-norhopane (TtX)	X	30D
17 β (H), 21 α (H)-30-norhopane (normoretane)	C29B	29 $\beta\alpha$
18 α (H)-oleanane		30O
17 α (H), 21 β (H)-hopane	C30A	30 $\alpha\beta$
17 β (H), 21 α (H)-hopane (moretane)	C30B	30 $\beta\alpha$
Gammacerane		
17 α (H), 21 β (H), 22(S)-homohopane	C31S	31 $\alpha\beta$ S
17 α (H), 21 β (H), 22(R)-homohopane	C31R	31 $\alpha\beta$ R
17 α (H), 21 β (H), 22(S)-bishomohopane	C32S	32 $\alpha\beta$ S
17 α (H), 21 β (H), 22(R)-bishomohopane	C32R	32 $\alpha\beta$ R
17 α (H), 21 β (H), 22(S)-trishomohopane	C33S	33 $\alpha\beta$ S
17 α (H), 21 β (H), 22(R)-trishomohopane	C33R	33 $\alpha\beta$ R
17 α (H), 21 β (H), 22(S)-tetrakishomohopane	C34S	34 $\alpha\beta$ S
17 α (H), 21 β (H), 22(R)-tetrakishomohopane	C34R	34 $\alpha\beta$ R
17 α (H), 21 β (H), 22(S)-pentakishomohopane	C35S	35 $\alpha\beta$ S
17 α (H), 21 β (H), 22(R)-pentakishomohopane	C35R	35 $\alpha\beta$ R

1 may be broad peak or doublet 2 may be doublet 3 listed in Statoil spreadsheets as "nor30" for convenience

Steranes

13 β (H), 17 α (H), 20(S)-cholestane (diasterane)	27a	27d β S
13 β (H), 17 α (H), 20(R)-cholestane (diasterane)	27b	27d β R
13 α (H), 17 β (H), 20(R)-cholestane (diasterane)	27c	27d α R
13 α (H), 17 β (H), 20(S)-cholestane (diasterane)	27d	27d α S
5 α (H), 14 α (H), 17 α (H), 20(S)-cholestane	27e	27 $\alpha\alpha$ S
5 α (H), 14 β (H), 17 β (H), 20(R)-cholestane	27f	27 $\beta\beta$ R
5 α (H), 14 β (H), 17 β (H), 20(S)-cholestane	27g	27 $\beta\beta$ S
5 α (H), 14 α (H), 17 α (H), 20(R)-cholestane	27h	27 $\alpha\alpha$ R
24-methyl-13 β (H), 17 α (H), 20(S)-cholestane (diasterane)	28a	28d β S
24-methyl-13 β (H), 17 α (H), 20(R)-cholestane (diasterane)	28b	28d β R
24-methyl-13 α (H), 17 β (H), 20(R)-cholestane (diasterane)	28c	28d α R
24-methyl-13 α (H), 17 β (H), 20(S)-cholestane (diasterane)	28d	28d α S
24-methyl-5 α (H), 14 α (H), 17 α (H), 20(S)-cholestane	28e	28 $\alpha\alpha$ S
24-methyl-5 α (H), 14 β (H), 17 β (H), 20(R)-cholestane	28f	28 $\beta\beta$ R
24-methyl-5 α (H), 14 β (H), 17 β (H), 20(S)-cholestane	28g	28 $\beta\beta$ S
24-methyl-5 α (H), 14 α (H), 17 α (H), 20(R)-cholestane	28h	28 $\alpha\alpha$ R
24-ethyl-13 β (H), 17 α (H), 20(S)-cholestane (diasterane)	29a	29d β S
24-ethyl-13 β (H), 17 α (H), 20(R)-cholestane (diasterane)	29b	29d β R
24-ethyl-13 α (H), 17 β (H), 20(R)-cholestane (diasterane)	29c	29d α R
24-ethyl-13 α (H), 17 β (H), 20(S)-cholestane (diasterane)	29d	29d α S
24-ethyl-5 α (H), 14 α (H), 17 α (H), 20(S)-cholestane	29e	29 $\alpha\alpha$ S
24-ethyl-5 α (H), 14 β (H), 17 β (H), 20(R)-cholestane	29f	29 $\beta\beta$ R
24-ethyl-5 α (H), 14 β (H), 17 β (H), 20(S)-cholestane	29g	29 $\beta\beta$ S
24-ethyl-5 α (H), 14 α (H), 17 α (H), 20(R)-cholestane	29h	29 $\alpha\alpha$ R
24-propyl-5 α (H), 14 α (H), 17 α (H), 20(S)-cholestane	30e	30 $\alpha\alpha$ S
24-propyl-5 α (H), 14 β (H), 17 β (H), 20(R)-cholestane	30f	30 $\beta\beta$ R
24-propyl-5 α (H), 14 β (H), 17 β (H), 20(S)-cholestane	30g	30 $\beta\beta$ S
24-propyl-5 α (H), 14 α (H), 17 α (H), 20(R)-cholestane	30h	30 $\alpha\alpha$ R
4-methyl-14 α (H), 17 α (H)-cholestanes		M28 $\alpha\alpha$
4,24-dimethyl-14 α (H), 17 α (H)-cholestanes		M29 $\alpha\alpha$
4-methyl-24-ethyl-14 α (H), 17 α (H)-cholestanes		M30 $\alpha\alpha$
4,23,24-trimethyl-14 α (H), 17 α (H)-cholestanes (dinosteranes)		M30D

C-RING MONOAROMATIC STEROID HYDROCARBONS (m/z 253)

Peak	R ₁	Substituents			Abbreviation of Compound
		R ₂	R ₃	R ₄	
A1					C ₂₁ M
B1					C ₂₂ MA
C1	β(H)	CH ₃	S(CH ₃)	H	βSC ₂₇ MA
	β(CH ₃)	H	S(CH ₃)	H	βSC ₂₇ DMA
D1	β(CH ₃)	H	R(CH ₃)	H	βRC ₂₇ DMA
	β(H)	CH ₃	R(CH ₃)	H	βRC ₂₇ MA
	α(H)	CH ₃	S(CH ₃)	H	αSC ₂₇ MA
E1	β(H)	CH ₃	S(CH ₃)	CH ₃	βSC ₂₈ MA
	α(CH ₃)	H	R(CH ₃)	H	αRC ₂₇ DMA
	β(CH ₃)	H	S(CH ₃)	CH ₃	βSC ₂₈ DMA
F1	α(CH ₃)	H	S(CH ₃)	CH ₃	αSC ₂₇ DMA
G1	α(H)	CH ₃	R(CH ₃)	H	αRC ₂₇ MA
	α(H)	CH ₃	S(CH ₃)	CH ₃	αSC ₂₈ MA
	β(H)	CH ₃	R(CH ₃)	CH ₃	βRC ₂₈ MA
	β(CH ₃)	H	R(CH ₃)	CH ₃	βRC ₂₈ DMA
	β(H)	CH ₃	S(CH ₃)	C ₂ H ₅	βSC ₂₉ MA
	βCH ₃	H	S(CH ₃)	C ₂ H ₅	βSC ₂₉ DMA
H1	α(H)	CH ₃	S(CH ₃)	C ₂ H ₅	αSC ₂₉ MA
	α(H)	CH ₃	R(CH ₃)	CH ₃	αRC ₂₈ MA
	β(H)	CH ₃	R(CH ₃)	C ₂ H ₅	βRC ₂₉ MA
	βCH ₃	H	R(CH ₃)	C ₂ H ₅	βRC ₂₉ DMA
I1	α(H)	CH ₃	R(CH ₃)	C ₂ H ₅	αRC ₂₉ MA

N.B. Not all possible DMA isomers are marked (rarely present in geological samples)

Derivation of aromatic steroid ratios reported in Table 7

$$\text{Arom 1} = g1 / ((g1 + H1b + I1) - (I1 * f1 / g1))$$

$$\text{Arom 2} = (a1 + b1 + c1 + d1 + e1 + f1 + g1) / (a1 + b1 + c1 + d1 + e1 + f1 + g1 + A1 + B1 + C1 + D1 + E1 + F1 + G1 + H1 + I1)$$

$$\text{Crack 1} = a1 / (a1 + g1)$$

$$\text{Crack 2} = (a1 + b1) / (a1 + b1 + c1 + d1 + e1 + f1 + g1)$$

N.B. H1b refers to second eluting (split) peak of doublet corresponding to H1 in standard figure

Codes for aromatic steroids

ABC-RING TRIAROMATIC STEROID HYDROCARBONS (m/z 231)

Peak	Substituents		Abbreviation of Compound
	R ₁	R ₂	
a1	CH ₃	H	C ₂₀ TA
b1	CH ₃	CH ₃	C ₂₁ TA
c1	S(CH ₃)	C ₆ H ₁₃	SC ₂₆ TA
d1	R(CH ₃)	C ₆ H ₁₃	RC ₂₆ TA
	S(CH ₃)	C ₇ H ₁₅	SC ₂₇ TA
e1	S(CH ₃)	C ₈ H ₁₇	SC ₂₈ TA
f1	R(CH ₃)	C ₇ H ₁₅	RC ₂₇ TA
g1	R(CH ₃)	C ₈ H ₁₇	RC ₂₈ TA

Derivation of biomarker ratios reported in Table ..

<u>Ratio</u>	<u>Derivation</u>	<u>m/z</u>
Triterpanes		
22S	$32\alpha\beta S / (32\alpha\beta S + 32\alpha\beta R)$	191
Ts/Tm	$27Ts / 27Tm$	191
TtX	$30d / 29\beta\alpha$	191
30D/H	$30d / 30\alpha\beta$	191
29/30H	$29\alpha\beta / 30\alpha\beta$	191
30 $\alpha\beta$	$30\alpha\beta / (30\alpha\beta + 30\beta\alpha)$	191
28 $\alpha\beta$ /H	$28\alpha\beta / 30\alpha\beta$	191
3R/H	$(23/3) / 30\alpha\beta$	191
4R/H	$(24/4) / 30\alpha\beta$	191
35/34H	$(35\alpha\beta R + 35\alpha\beta S) / (34\alpha\beta R + 34\alpha\beta S)$	191
Dem/H	$25nor30\alpha\beta / 30\alpha\beta$	191
O/H	$30O / 30\alpha\beta$	191
G/H	$30G / 30\alpha\beta$	191
ppmH'	$\text{ppm } 27Ts + 27Tm + 29\alpha\beta + 29\beta\alpha + 30\alpha\beta + 30\beta\alpha + 31\alpha\beta S + 31\alpha\beta R + 32\alpha\beta S + 32\alpha\beta R + 33\alpha\beta S + 33\alpha\beta R + 34\alpha\beta S + 34\alpha\beta R + 35\alpha\beta S + 35\alpha\beta R$	191
Steranes		
20S	$29\alpha\alpha S / (29\alpha\alpha R + 29\alpha\alpha S)$	217
$\beta\beta$	$(29\beta\beta R + 29\beta\beta S) / (29\beta\beta R + 29\beta\beta S + 29\alpha\alpha R + 29\alpha\alpha S)$	217
%C27	$100 * (27\beta\beta R + 27\beta\beta S) / (27\beta\beta R + 27\beta\beta S + 28\beta\beta R + 28\beta\beta S + 29\beta\beta R + 29\beta\beta S)$	218
%C28	$100 * (28\beta\beta R + 28\beta\beta S) / (27\beta\beta R + 27\beta\beta S + 28\beta\beta R + 28\beta\beta S + 29\beta\beta R + 29\beta\beta S)$	218
%C29	$100 * (29\beta\beta R + 29\beta\beta S) / (27\beta\beta R + 27\beta\beta S + 28\beta\beta R + 28\beta\beta S + 29\beta\beta R + 29\beta\beta S)$	218
C30/st	$(30\beta\beta R + 30\beta\beta S) / (27\beta\beta R + 27\beta\beta S + 28\beta\beta R + 28\beta\beta S + 29\beta\beta R + 29\beta\beta S)$	218
Dia/reg	$(27d\beta R + 27d\beta S) / (27\alpha\alpha R + 27\alpha\alpha S)$	217
ppmS'	$\text{ppm } 27\beta\beta R + 27\beta\beta S + 28\beta\beta R + 28\beta\beta S + 29\beta\beta R + 29\beta\beta S$	218
H/S	$\text{Intensities}(27Ts + 27Tm + 29\alpha\beta + 29\beta\alpha + 30\alpha\beta + 30\beta\alpha + 31\alpha\beta S + 31\alpha\beta R + 32\alpha\beta S + 32\alpha\beta R + 33\alpha\beta S + 33\alpha\beta R + 34\alpha\beta S + 34\alpha\beta R + 35\alpha\beta S + 35\alpha\beta R) / \text{Intensities}(27\beta\beta R + 27\beta\beta S + 28\beta\beta R + 28\beta\beta S + 29\beta\beta R + 29\beta\beta S)$	

* ppm calculated from comparison with m/z 219 intensity for D2-cholestane

Table 12a: Variation in Triaromatic Sterane Distribution (peak height) for Well NOCS 35/10-2(2T2)

Depth unit of measure: m

<u>Depth</u>	<u>Lithology</u>	<u>Ratio1</u>	<u>Ratio2</u>	<u>Ratio3</u>	<u>Ratio4</u>	<u>Ratio5</u>	<u>Sample</u>
1953.00	Sh/Clst	0.52	0.52	0.32	0.30	0.41	0024-1
1955.00	Sh/Clst	0.69	0.63	0.34	0.40	0.41	0003-1
3942.00	Sh/Clst	1.00	1.00	0.86	0.91	0.93	0027-1
4094.00	Sh/Clst	1.00	1.00	1.00	1.00	1.00	0010-1
4166.65	S/Sst	1.00	1.00	1.00	1.00	1.00	0013-1
4198.15	S/Sst	1.00	1.00	1.00	1.00	1.00	0016-1
4220.75	S/Sst	0.72	0.64	0.40	0.47	0.50	0020-1
4248.00	S/Sst	0.63	0.57	0.29	0.34	0.37	0034-1
4317.00	Sh/Clst	-	-	-	-	-	0022-1
4365.00	Sh/Clst	1.00	1.00	1.00	1.00	1.00	0040-2

Ratio1: $a1 / a1 + g1$

Ratio2: $b1 / b1 + g1$

Ratio3: $a1 + b1 / a1 + b1 + c1 + d1 + e1 + f1 + g1$

Ratio4: $a1 / a1 + e1 + f1 + g1$

Ratio5: $a1 / a1 + d1$

Table 12c: Aromatisation of Steranes (peak height) for Well NOCS 35/10-2 (2T2)

Depth unit of measure: m

<u>Depth</u>	<u>Lithology</u>	<u>Ratio1</u>	<u>Ratio2</u>	<u>Sample</u>
1953.00	Sh/Clst	0.86	0.23	0024-1
1955.00	Sh/Clst	0.48	0.80	0003-1
3942.00	Sh/Clst	0.87	-	0027-1
4094.00	Sh/Clst	1.00	-	0010-1
4166.65	S/Sst	1.00	-	0013-1
4198.15	S/Sst	1.00	-	0016-1
4220.75	S/Sst	0.77	0.50	0020-1
4248.00	S/Sst	0.61	0.88	0034-1
4317.00	Sh/Clst	1.00	-	0022-1
4365.00	Sh/Clst	1.00	-	0040-2

$$\text{Ratio1: } \frac{\text{C1+D1+E1+F1+G1+H1+I1}}{\text{C1+D1+E1+F1+G1+H1+I1} + \text{c1+d1+e1+f1+g1}}$$

$$\text{Ratio2: } \text{g1} / \text{g1} + \text{II}$$

Table 12e: Raw monoaromatic sterane data (peak height) m/z 253 for Well NOCS 35/10-2(2T2)

Depth unit of measure: m

Depth	Lithology	A1	B1	C1	D1	E1	F1	G1	H1	I1	Sample
1953.00	Sh/Clst	764.0	1942.8	1425.0	1752.4	4766.1	366.5	6739.3	7493.1	2954.3	0024-1
1955.00	Sh/Clst	1762.0	1023.8	1999.0	1437.5	3863.2	1066.6	2907.8	2088.8	491.1	0003-1
3942.00	Sh/Clst	200.1	138.1	359.0	44.4	264.6	193.5	316.0	1501.9	92.6	0027-1
4094.00	Sh/Clst	0.0	49.7	352.7	90.7	503.4	252.0	591.0	2219.9	218.1	0010-1
4166.65	S/Sst	110.5	52.1	248.8	0.0	201.0	118.2	454.1	1031.3	54.0	0013-1
4198.15	S/Sst	73.9	32.6	184.2	0.0	242.3	78.7	487.6	1154.2	62.8	0016-1
4220.75	S/Sst	75.2	46.2	145.0	119.2	349.4	57.6	297.4	723.1	81.5	0020-1
4248.00	S/Sst	222.3	83.9	492.9	209.6	572.7	0.0	1061.3	2064.3	49.1	0034-1
4317.00	Sh/Clst	0.0	2.6	18.6	0.0	42.5	0.0	91.0	171.9	6.6	0022-1
4365.00	Sh/Clst	98.3	67.5	365.6	118.7	341.0	178.4	465.5	1371.5	86.7	0040-2

Table 14B: Isotopic Composition of Gas Samples from well NOCS 35/10-2 GASES

Depth unit of measure: m

Depth	Typ	Lithology	C1 d13C	C1 dD	C2 d13C	C3 d13C	iC4 d13C	nC4 d13C	CO2 d13C	CO2 d18O	Sample
4199.30	gas	bulk	-40.6	-182.0	-25.6	-22.9	-26.0	-25.4	-23.2	-16.1	0002-0B
4217.90	gas	bulk	-36.2	-220.0	-	-	-	-	-	-	0001-0B



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1 Stable isotope analysis of gas samples

1.1 Introduction

Two gas samples from well 35/10-2 (2T2); FMT 31.07.96 - 4217.9m and FMT 02.08.96 - 4199.3m, are analysed for gas and isotopic composition.

On the samples C₁ - C₅ and CO₂ are quantified. The δ¹³C value is measured on methane, ethane, propane, the butanes and CO₂ when possible. In addition the δD value is measured on methane.

1.2 Analytical procedures

1.0 ml of the gas samples is sampled with a syringe for analysis on a Porapak Q column connected with flame ionisation (FID) and thermal conductivity (TCD) detectors. The detection limit for the hydrocarbon gas components is 0.01 µl/ml and for CO₂ 0.2 µl/ml.

For the isotope analysis about 5 ml is sampled with a syringe and then separated into the different gas components by a Carlo Erba 4200 gas chromatograph. The hydrocarbon gas components are oxidised in separate CuO-ovens in order to prevent cross contamination. The combustion products CO₂ and H₂O are frozen into collection vessels and separated.

The combustion water is reduced with zinc metal in sealed quartz tubes to prepare hydrogen for isotopic analysis. The isotopic measurements are performed on a Finnigan MAT 251 and a Finnigan Delta mass spectrometer.

IFEs value on NBS 22 is $-29.77 \pm .06\%$ PDB.

The uncertainty in the δ¹³C value is estimated to be $\pm 0.3\%$ PDB and includes all the different analytical steps. The estimate is based on repeated analysis of a laboratory standard gas mixture. The uncertainty in the δD value is likewise estimated to be $\pm 5\%$.

1.3 Results

The volume composition of the gas samples is shown in Table 1 (normalised composition), and the stable isotope composition is shown in Table 2.

The FMT 31.07.96 sample had a low hydrocarbon concentration when quantified and when sampling for isotope analysis (three days later) the concentration was even lower and we were only able to determine the methane isotope composition. A leak in the sample container cannot be excluded.

Table 1 Volume composition (normalised values) of gas samples from well 35/10-2 (2T2)

Sample	IFE no GEO	C ₁ %	C ₂ %	C ₃ %	iC ₄ %	nC ₄ %	iC ₅ %	nC ₅ %	CO ₂ %	ΣC ₁ -C ₅ %	Wet- ness	iC ₄ / nC ₄
FMT 31.07.96, 4217.9m	961017	92.3	3.5	0.4	0.05	0.05	0.01	0.01	3.7	96.3	0.04	1.06
FMT 02.08.96, 4199.3m	961018	92.5	5.3	1.0	0.13	0.2	0.06	0.05	0.8	99.2	0.07	0.81

Table 2 Isotopic composition of gas samples from well 35/10-2 (2T2)

Sample	IFE no GEO	C ₁ δ ¹³ C ‰PDB	C ₁ δD ‰ SMOW	C ₂ δ ¹³ C ‰PDB	C ₃ δ ¹³ C ‰PDB	iC ₄ δ ¹³ C ‰PDB	nC ₄ δ ¹³ C ‰PDB	CO ₂ δ ¹³ C ‰PDB	CO ₂ δ ¹⁸ O ‰PDB
FMT 31.07.96, 4217.9m	961017	-36.2	-220						
FMT 02.08.96, 4199.3m	961018	-40.6	-182	-25.6	-22.9	-26.0	-25.4	-23.2	-16.1

4 Literature

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2 Vitrinite reflectance

2.1 Introduction

This section gives the results of vitrinite reflectance analysis of 34 samples (33 cuttings and one core sample) covering the interval from 1470 to 4668 mRKB in well 35/10-2, 2T2 offshore Norway.

2.2 Material

Sample material

The material was provided as washed cuttings and one core chip.

Geological information and casing points

No information on geology nor casing points were provided.

2.3 Analytical techniques

Preparation

The cuttings samples were treated with hydrochloric acid prior to further preparation. The aim was to avoid soft and expanding mineral phases in order to ensure good polishing quality and to concentrate the organic material.

The core sample was not treated with any acid before further preparation.

The core sample and the HF-residues of the cuttings samples were embedded in an epoxy resin to make briquettes. These were subsequently ground flat and polished using 0.25 micron diamond paste and magnesium oxide as the two final steps.

Analysis

The analytical equipment being used was a Zeiss MPM 03 photometer microscope equipped with an Epiplan-Neofluoar 40/0.90 oil objective. The sensitive measuring spot was kept constant for all the measurements at about 2.5 micron in diameter. The measurements were made through a green band pass filter (546 nm) and in oil immersion (refractive index 1.515 at 18 °C). The readings were made without a polariser and using a stationary stage. This procedure is called measurement of random reflectance (%Rm). The photometer was calibrated daily against a standard of known reflectance (%Rm=0.588) and routinely checked against two other standards of significantly different reflectances (%Rm=0.879 and 1.696). A deviation from these values of less than ± 0.01 %Rm and ± 0.02 %Rm respectively is considered as acceptable. The calibration is routinely checked during the course of measuring, at least every hour. A deviation of less than ± 0.005 %Rm is considered as acceptable.

For each sample up to 20 points were measured if possible, sometimes more, and quality ratings are given to various aspects which may affect the measurements. The aspects are: abundance of vitrinite, uncertainties in the identification of indigenous vitrinite, type of vitrinite, particle size, particle surface quality and abundance of pyrite.

Presentation of results

The raw data for the measurements are presented in the appendix for each sample both as tabulated data and histograms. A true vitrinite population is selected among the readings based on observations made while measuring, and an arithmetic mean value and standard deviation are calculated for this and eventual other populations. A quality rating is given to the interpreted true population. The results are listed in Table 3.

2.4 Results

It has been possible to establish fairly reliable vitrinite reflectance results for the samples, and two of the samples are of good quality. It has also been possible to establish a fairly reliable vitrinite reflectance versus depth trend. There are, however, some uncertainties regarding the trend deeper than approximately 4300 mRKB due to poor sample quality.

Table 3 Vitrinite reflectance data

Well
35/10-2, 2T2

IFE no.	Depth mRKB	Well	Sample type	Lithology	%Rm	Std. Dev.	N	Quality	Preparation
961019	1470.0	35/10-2	cut	dst	0.25	0.04	17	M	HF
961020	1570.0	35/10-2	cut	dst	0.30	0.05	20	M	HF
961021	1670.0	35/10-2	cut	dst	0.31	0.05	18	M	HF
961022	1770.0	35/10-2	cut	dst	0.33	0.06	7	P	HF
961023	1869.0	35/10-2	cut	dst/slst	0.38	0.05	9	P	HF
961024	1980.0	35/10-2	cut	dst	0.32	0.10	20	P	HF
961025	2070.0	35/10-2	cut	dst	0.34	0.05	9	P	HF
961026	2170.0	35/10-2	cut	dst	0.48	0.09	17	P	HF
961027	2270.0	35/10-2	cut	dst	0.48	0.04	14	M	HF
961028	2370.0	35/10-2	cut	slst	0.47	0.07	4	P	HF
961029	2470.0	35/10-2	cut	dst	0.49	0.04	13	M	HF
961030	2570.0	35/10-2	cut	dst	0.54	0.04	13	M	HF
961031	2670.0	35/10-2	cut	dst	0.57	0.07	19	M	HF
961032	2770.0	35/10-2	cut	dst	0.54	0.08	20	M	HF
961033	2870.0	35/10-2	cut	dst	0.58	0.10	21	M	HF
961034	2970.0	35/10-2	cut	dst	0.55	0.09	4	P	HF
961035	3070.0	35/10-2	cut	dst	0.59	0.09	20	P	HF
961036	3170.0	35/10-2	cut	dst	0.66	0.09	18	P	HF
961037	3270.0	35/10-2	cut	dst	0.67	0.09	20	P	HF
961038	3280.0	35/10-2T2	cut	dst	0.74	0.13	14	P	HF
961039	3380.0	35/10-2T2	cut	dst	0.72	0.07	15	P	HF
961040	3460.0	35/10-2T2	cut	slst	0.87	-	1	P	HF
961041	3560.0	35/10-2T2	cut	slst	0.63	0.06	2	P	HF
961042	3650.0	35/10-2T2	cut	dst	1.36	0.14	15	X	HF
961043	3770.0	35/10-2T2	cut	dst	1.40	0.16	22	X	HF
961044	3870.0	35/10-2T2	cut	dst	0.86	0.03	4	P	HF
961045	3969.0	35/10-2T2	cut	dst	0.85	0.08	15	P	HF
961046	4071.0	35/10-2T2	cut	dst	0.98	0.10	25	P	HF
961052	4199.5	35/10-2T2	core	dst	1.13	0.07	23	G	bulk
961047	4254.0	35/10-2T2	cut	coal	1.20	0.08	20	G	HF
961048	4371.00	35/10-2T2	cut	dst	1.13	0.08	17	P	HF
961049	4470.0	35/10-2T2	cut	dst	1.22	0.13	21	P	HF
961050	4569.00	35/10-2T2	cut	dst	1.36	0.24	20	P	HF
961051	4668.0	35/10-2T2	cut	dst	1.40	0.21	16	P	HF

Legend																	
G	Good quality	st	Staining	sst	sandstone												
M	Moderate quality					Barren	Barren of vitrinite	slst	siltstone								
P	Poor quality									HF	HF-treated	clst	claystone				
X	Not vitrinite													Bulk	Bulk rock	cm	carbominerite
A	Mud additive																